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Minerals Need Assessment Update 2018

HEREFORDSHIRE MINERALS AND WASTE LOCAL PLAN DRAFT PLAN

Hendeca
NOVEMBER 2018

Contents

Annex

1. Introduction

1.1 Background and Purpose of this Document

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

1.1.2 The National Planning Policy Framework (published July 2018, the NPPF) advises '*it is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs*.' (paragraph 203) This is to be achieved, not least by making provision for the maintenance of landbanks of: at least 7 years for sand and gravel; and at least 10 years for crushed rock. These minerals are found in Herefordshire and are being actively quarried; they are addressed within this report.

1.1.3 The NPPF also seeks a steady and adequate supply of industrial minerals, including: silica sand; cement primary (chalk and limestone) and secondary (clay and shale) materials; and brick clay. These minerals are not currently understood to be readily available or actively worked within the county; they are not considered further within this report.

1.1.4 A Minerals Need Assessment was produced in February 2017 (MNA 2017) to provide an assessment of key factors relating to the need for minerals such as the amount and type of mineral within the county and future demands for it.

1.1.5 The MNA 2017 was made available for consultation alongside the Issues and Options Report, undertaken as part of the MWLP development process.

1.1.6 A number of comments on the MNA 2017 were received from consultees in response to the consultation. This updated need assessment (MNA Update 2018) seeks to respond to those comments to the extent possible, and updates the principal data as new information has become available.

Updates

1.1.7 The following additional sources of data have been used in this MNA Update 2018:

- Refreshed data collated for the Local Aggregate Assessment;
- The West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January to December 2016; and
- Collation of the Results of the 2014 Aggregate Minerals Survey for England and Wales, prepared by the British Geological Survey for the Department for Communities and Local Government and the Welsh Government, dated March 2016.

1.1.8 In addition to responding to consultation comments received, the MNA Update 2018 has incorporated some new versions of data sources which have become available since the MNA 2017 was published.

- a briefing paper on regional and country economic indicators produced by the House of Commons Library;
- an economic and fiscal outlook at the national level published by the Office for Budget Responsibility (OBR); and
- a forecast of construction output nationally from the Construction Products Association.

1.1.9 Each of the sites identified in Table 2.1 of the MNA 2017 have been visited, providing knowledge about the nature of activities undertaken. Table 2.1 of this MNA Update 2018 is consequently refreshed.

1.1.10 The MNA 2017 provided forecasts of need to 2031. As well as updating the 2031 forecasts, this MNA Update 2018 extends some of the forecasts to 2035.

1.1.11 This report updates the principal data tables and figures from the MNA 2017, where new data is available, to determine if there are any notable changes that affect the conclusions made.

1.1.12 This MNA Update 2018 has been prepared to be a discrete report, so the reader does not need to refer back to WNA 2017; where there are interesting comparisons to be made cross referencing is provided as appropriate.

Structure

1.1.13 This report is structured as follows:

- Section 1 – Introduction and Data Sources;
- Section 2 – Minerals within Herefordshire: refreshed information about existing and former quarries in the county;
- Section 3 – Aggregates, Baseline: an understanding of the current permitted reserves of sand and gravel and crushed rock;
- Section 4 – Aggregates Future, Demand: and assessment of the potential future demand for aggregates, including recycled aggregates;
- Section 5 - Other Minerals: building stone; and hydrocarbons; and
- Section 6 – Conclusions: presenting the key conclusions made from the information available.

1.2 Data sources

Annual Minerals Survey

1.2.1 Herefordshire Council undertakes an Annual Minerals Survey of operators in the county to obtain data on: permitted reserves of aggregates at the end of the calendar year; sales of minerals during the year; and the destination point of those sales. This data is collated so that figures for individual operators cannot be identified.

1.2.2 The most recent year for which this data exists is 2017.

1.2.3 This report is hereafter referred to as the Herefordshire AMS 2017.

Local Aggregates Assessment

1.2.4 The results of the Annual Minerals Survey are used to compile the Local Aggregate Assessment (LAA). Mineral planning authorities (MPA) are required to prepare a LAA and to update it annually. The LAA is required to:

- forecast the demand for aggregates based on average 10-years sales data and other relevant supply information; and
- analyse supply options through the consideration of current planning permissions and minerals safeguarding areas.

1.2.5 The most recently published LAA data for Herefordshire[1] was published in 2017, with the Core Strategy 2017 Authority Monitoring Report, and related to minerals data for 2015.

1.2.6 Herefordshire Council has consequently gathered data up to December 2017 (the Herefordshire AMS 2017) and this has been made available to prepare this MNA Update 2018, although the updated LAA has not yet been published.

1.2.7 This LAA is hereafter referred to as the LAA 2018.

West Midlands Aggregate Working Party Annual Monitoring Report

1.2.8 The West Midlands Aggregate Working Party (WM AWP) is a technical group concerned with data collection, collation and monitoring. It also provides advice on future trends in and affecting the area, together with the environmental and other implications of meeting Government aggregate demand forecasts.

1.2.9 The WM AWP draws its members from the MPA in the region[2] together with representatives from the minerals industry through its trade associations, the Mineral Products Association and the British Aggregates Association, plus the Ministry of Housing, Communities and Local Government, the National Federation of Demolition Contractors, and the Environment Agency.

1.2.10 Data from the Annual Minerals Survey undertaken by each relevant MPA is collated by the WM AWP, which produces a regional Annual Monitoring Report.

1.2.11 The most recent WM AWP Annual Monitoring Report is for 2016.[3] This provides sales and reserves data for the 2016 calendar year as well as data for earlier years.

1.2.12 This report is hereafter referred to as the West Midlands AMR 2016.

Aggregate Minerals Survey

1.2.13 The Department for Communities and Local Government[4] (DCLG) publishes the Aggregate Minerals Survey[5] every four years, a collation of data from the Annual Minerals Surveys undertaken by each MPA in England and Wales. The most recent available version is for 2014.[6]

1.2.14 The report presents sales of aggregates produced in Herefordshire and also the destination for those sales, either within Herefordshire, in the West Midlands or elsewhere. The report also shows movement of materials, setting out information on the inter-regional flow of aggregates.

1.2.15 The three most recent Aggregate Minerals Surveys are used within this report, i.e. those published for 2005, 2009 and 2014. It is recognised that some of this data is now somewhat

[1] Herefordshire Local Aggregates Assessment v1.3 Draft, Herefordshire Council, December 2014

[2] Herefordshire, Worcestershire, Shropshire, Staffordshire, Warwickshire and the West Midlands Conurbations.

[3] West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016. Urban Vision Partnership Ltd, undated.

[4] It is recognised that this Department is now the Ministry for Housing, Communities and Local Government, but the Ministry has not published minerals data to date. Consequently, reference to the Department for Communities and Local Government, or DCLG, is retained within this report.

[5] http://webarchive.nationalarchives.gov.uk/20121030202828/http://www.communities.gov.uk/planningandbuilding/planningbuilding/planningresearch/researchreports/mineralswasteresearch/aggregatemineralssurveys

[6] https://www.gov.uk/government/publications/aggregate-minerals-survey-for-england-and-wales-2014

old, but it is considered to provide useful and relevant context information for policy preparation.

1.2.16 These reports are hereafter referred to as the DCLG AMS 2005, DCLG AMS 2009, and DCLG AMS 2014.

1.2.17 It is also important to note that the 2014 data has not been verified by the British Geological Survey, and discussions with adjacent MPA has questioned its accuracy. However, it remains the best available data in relation to both minerals movements across administrative boundaries and consumption within an authority.

Annual Raised Enquiry

1.2.18 The Office for National Statistics (ONS) carries out an Annual Raised Enquiry of the sales of all minerals, except coal, for the MHCLG and the Department for Business, Energy and Industrial Strategy. The data is presented in an annual report, Mineral Extraction in Great Britain, the latest available version of which is for 2014.[7]

1.2.19 Data is available at county level. However, for Herefordshire figures are only available for building stone. The figures for sand and gravel and for crushed rock within Herefordshire are confidential.

Construction, Demolition and Excavation Waste Survey

1.2.20 In February 2007, DCLG published the Survey of Arisings and Use of Alternatives to Primary Aggregates in England.[8] This report was generated by information gained from operators of crushers and screens and of licensed landfill sites for the year 2005. Its purpose was to generate estimates for the amount of recycled aggregates and soil used and disposed of at licensed landfill facilities and for construction, demolition and excavation waste (CD&E waste) spread on registered exempt sites.

1.2.21 This was the third in a series of surveys undertaken every two years and provides figures for Herefordshire and Worcestershire combined. However, it is quite an old data source and is used for background context only.

Waste Need Assessment 2017 and Update 2018

1.2.22 Alongside this assessment of need for minerals, Herefordshire has commissioned preparation of a waste need assessment. This study uses the current method for estimating the amount of CD&E waste available for use as a recycled aggregate and provides data relevant to Herefordshire only.

1.2.23 An update of the Waste Need Assessment dated February 2017 has been undertaken and produced in November 2018 to take account of new sources of data on waste and responses made to the Issues and Options Report.

1.2.24 This report is hereafter referred to as the WNA 2018 Update.

[7] Mineral Extraction in Great Britain 2014, DCLG, March 2016. https://www.gov.uk/government/statistics/mineral-extraction-in-great-britain-2014 [27.10.2016@11.26]

[8] Survey of Arisings and Use of Alternatives to Primary Aggregates in England 2005: Final Report, DCLG, February 2007

2. Minerals within Herefordshire

2.1 Overview

2.1.1 Herefordshire's bedrock geology is almost entirely sedimentary in origin. It is dominated by the Old Red Sandstone, but fringed by older rocks and covered in a mantle of ice age deposits.

2.1.2 The predominant underlying geology of Herefordshire consists of Devonian Old Red Sandstone, comprising mudstones and sandstone. However, there are some older outcrops occurring in the north-west of the county around Brampton Bryan consisting of mudstones, sandstones and volcanic rocks. Silurian mudstones and siltstones also occur in this area. Significant outcrops of limestone also occur in the north-west of the county, in the areas around Aymestrey, Leintwardine and towards the Welsh border near Presteigne.

2.1.3 Silurian limestone and mudstones also outcrop in the Woolhope area, surrounded by the younger Old Red Sandstone rocks. Similar aged hard rocks also occur on the western flanks of the Malvern Hills, on the border with Worcestershire.

2.1.4 Throughout Herefordshire, there are superficial sedimentary deposits of glacial tills, sand and gravels.

2.2 Quarrying in Herefordshire

2.2.1 Known mineral resources in Herefordshire are relatively limited in range, primarily consisting of aggregates for use in construction but also a small amount of building stone. Aggregates comprise: sand and gravel; crushed rock; and secondary or recycled materials gained from quarry and waste operations.

2.2.2 The British Geological Survey (BGS) was commissioned to provide further detail on the mineral resource within Herefordshire and its viability for use. This information has been used in preparing minerals policy of the MWLP.

2.2.3 Using the currently available information, the commercially exploitable minerals available for extraction from within Herefordshire include sand, gravel, crushed rock and sandstone.

- Sand and gravel:
  - River terrace deposits are mainly found in the river valleys of the Wye, Lugg and Arrow; and
  - Glacial deposits are present in the north and west of Herefordshire.
- Crushed rock:
  - Silurian limestone is found on the western side of the Malvern Hills and Ledbury, the Woolhope dome and in the north-west of the county in the Presteigne/Aymestrey areas;
  - Carboniferous limestone is present to the south-west of Ross-on-Wye in the northern flanks of the Forest of Dean; and
  - Igneous and metamorphic rock occurs in the Malvern Hills.

- Sandstone occurs extensively throughout much of Herefordshire and several operational quarries exist in the north, west and south of the county. The output is of particular importance for heritage restoration and in creating authentic character for new-build properties.

2.2.4 Secondary and recycled materials have an important role to play in the overall supply of aggregates. Secondary aggregates are minerals that are produced as a by-product of other mining or quarrying activities or as a by-product of an industrial process. Recycled aggregates arise from several sources, notably from the demolition of buildings or from civil engineering works such as asphalt planings from road resurfacing and railway track ballast. Recycling aggregates usually involves the removal of unwanted or inappropriate material such as fines, wood, plastic and metal, and some form of treatment (crushing, washing and/or screening) to reach industry standards for its re-use.

2.2.5 Coal was formerly worked in two locations:

- the southern tip of the Wyre Forest Coalfield, which extended into the north of the county, near the boundary with Worcestershire and Shropshire; and
- a small outlier site of the Forest of Dean Coalfield which extends into southern Herefordshire.

2.2.6 In 1999, the BGS[9] reported that the hydrocarbon prospectivity of the county was low. Wells drilled to test the oil and gas potential of sandstones in the Worcestershire Basin and rocks in the Woolhope Inlier had failed to discover hydrocarbons.

2.2.7 Coalbed methane is believed to lie in the south of the county, within a reserve that also lies in Gloucestershire. At the time of writing there was no publicly stated intention to work the reserve.

2.2.8 Table 2.1 presents the currently known information about quarries in Herefordshire, these are presented graphically in Figure 2.1.

2.2.9 Moreton on Lugg Quarry (see Table 2.1 of the MNA 2017) has been renamed Upper Lyde Quarry in Table 2.1 of this Update.

2.2.10 This data has been collated for information and should not be relied upon for commercial purposes.

[9] Mineral Resource Information for Development Plans: Phase One Herefordshire and Worcestershire: Resources and Constraints, BGS and the Department of the Environment Transport and the Regions, 1999

Table 2.1 Identified mineral sites, Herefordshire

Quarry name	Status	Planning history	Operational requirements
Sand and gravel			
Stretton Sugwas Quarry (Hereford Quarry)	Closed	Approval in June 2004 for extraction of sand and gravel.	
Lugg Bridge Quarry	Closed	Approval in 2005 for restoration of redundant sand and gravel quarry. Permission in October 2013 for change of use from sand and gravel and ancillary ready mixed concrete plant to stand alone ready mixed concrete plant.	
Upper Lyde Quarry	Permitted but not operational		Requires highway improvements.
Shobdon Quarry	Inactive	Review of Old Mineral Permission (ROMP) approved July 2005.	
Wellington Quarry	Active	Permission in February 2013 to extend operational area for sand and gravel extraction.	Winning and working to cease by 31 December 2026.
St Donat's Quarry	Restored	Approval in January 1997 for extraction of sand and gravel. Permission granted in September 2004 to vary condition 1, required works to commence within 5 years. Consent not implemented and now lapsed.	
Limestone			
Leinthall Quarry	Active	Permission in November 2009 for continuation of operations.	Reclamation by August 2027.
Loxter Ashbed Quarry	Restored	Permission in January 2000 for restoration of part of quarry to woodland. Permission in July 2001 for temporary haul road for quarry.	
Nash Scar Quarry	Mothballed	Permission in January 2011 to extend deadline for scheme submission to August 2026.	
Perton Quarry	Active	Permission in May 2000 for continued extraction and processing of limestone. Refusal in January 2002 for extension of hours for lorry movements.	All extraction and restoration to cease by February 2042.

Quarry name	Status	Planning history	Operational requirements
Sandstone			
Brakes Farm Delve	Abandoned	Permission given in October 2008 for the winning, working and preparation of Downton Castle stone.	Maximum of 4 vehicle movements in 24 hrs Development, including restoration, will cease no more than 15 years from commencement date. Commencement must begin within 3 years of the permission date.
Callow Delve	Active	Permission given in August 2013 for extension of existing approved mineral extraction to excavate area of 0.075 hectares. Officer report describes sand and gravel quarry as ceased.	The maximum volume of aggregate to be exported from the site shall not exceed 15% of the total export of building stone from the site, averaged over a 3-year period. Sufficient building stone for hand working shall be made available during the life of the quarry to supply the reasonable demand for such stone in the local area.
Black Hill Delve (formerly Coed Major Delve)	Active	Planning approval given in October 1999 for extension to small sandstone quarry.	
High House Delve	Unsuccessful, never exploited	Approval in August 2002 for extraction of sandstone using low tech tools and limited use of farm size machinery.	
Hunters Post Delve	Closed, naturally regenerated	Listed by the BGS and Historic England's Heritage's Strategic Stone Study[10] as active in 2014.	
Llandraw Delve	Active	Permission in January 2014 for reopening of disused delve.	Maximum of 3 vehicle outbound movements per day and maximum of 12 per week. Cessation of workings by 7 years from permission (January 2014).
Pennsylvani Delves	Active	Approval in July 2000 for surface quarrying of flagstones, roofing tiles and building stone.	

[10] http://www.bgs.ac.uk/mineralsuk/buildingStones/StrategicStoneStudy/EH_atlases.html

Quarry name	Status	Planning history	Operational requirements
Sunnybank Delve	Active	Permission in August 2002 for extraction of building stone using chisels, hammer and limited use of farm size machinery.	
Tybubach Delve	Abandoned, to be restored	Permission in December 2010 for time extension.	Maximum of 3 vehicle movements in a day and maximum of 12 per week. All development, including restoration, is to take place within 15 years of commencement of activity. Activity is to commence within 5 years of the permission.
Westonhill Wood Delves	Active	Permission in March 2014 to extend life of existing quarry and alter site areas for good access to quality stone.	Maximum of 6 outbound vehicles per day and maximum of 25 per week. Development, including restoration, to cease not later than 25 years from date of permission (March 2014).
Coal			
Howle Hill Quarry	Restored	Permission refused in October 2004 for infill with inert material and restoration to agricultural use.	

Herefordshire Minerals and Waste Local Plan

Figure 2.1
Identified mineral sites, Herefordshire

ID	Name	Mineral	Status	Postcode
1	Stretton Sugwas Quarry (Hereford Quarry)	Sand and gravel	Closed	HR4 7QD
2	Lugg Bridge Quarry	Sand and gravel	Closed	HR1 3LZ
3	Upper Lyde Quarry	Sand and gravel	Inactive	HR4 8AH
4	Shobdon Quarry	Sand and gravel	Inactive	HR6 9LA
5	Wellington Quarry	Sand and gravel	Active	HR4 8BY
6	St Donat's Quarry	Sand and gravel	Restored	HR4 8NQ
7	Leinthall Quarry	Limestone	Active	HR6 9TR
8	Loxter Ashbed Quarry	Limestone	Restored	HR8 1NU
9	Nash Scar Quarry	Limestone	Mothballed	LD8 2LE
10	Perton Quarry	Limestone	Active	HR1 4ED
11	Brakes Farm Delve	Sandstone	Abandoned	SY8 2LF
12	Callow Delve	Sandstone	Active	NP25 5RL
13	Black Hill Delve (formerly Coed Major Delve)	Sandstone	Active	HR2 0PX
14	High House Delve	Sandstone	Closed	HR2 0ND
15	Hunters Post Delve	Sandstone	Closed	NP25 5RW
16	Llandraw Delve	Sandstone	Active	HR2 0PW
17	Pennsylvani Delves	Sandstone	Active	HR2 0PU
18	Sunnybank Delve	Sandstone	Active	HR2 0LA
19	Tybubach Delve	Sandstone	Closed	HR2 0PH
20	Westonhill Wood Delves	Sandstone	Active	HR3 6DD
21	Howle Hill Quarry	Coal	Restored	HR9 5SH

Legend

Minerals Facilities

Type

- Coal
- Limestone
- Sand and gravel
- Sandstone

Status

- Active
- Restored
- Uncertain
- Inactive/Closed
- Herefordshire County Boundary

N

0 5 10 15

Kilometres

SCALE 1:250,000 @ A3

DATE 01/04/2018

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3. Aggregates, Baseline

3.1 Introduction

3.1.1 This section of the MNA Update 2018 deals with aggregates, consisting of sand and gravel, crushed rock, marine aggregates and secondary and recycled aggregates. It aims to identify the current level of supply of aggregates, assessed in terms of sales, and compare this with the existing and likely future demand for aggregates over the lifetime of the MWLP.

3.2 Supply of sand and gravel

3.2.1 There are three sand and gravel quarries permitted within Herefordshire:

- Upper Lyde Quarry;
- Shobdon Quarry; and
- Wellington Quarry.

3.2.2 However, only Wellington Quarry is operational at the time of writing. Due, in large part, to the openness of that operator, it is possible to understand a reasonable level of detail about sand and gravel reserves, supply and potential demand within Herefordshire.

LAA 2018

3.2.3 Despite the fact that there is only one producer of sand and gravel in the county, the operator has agreed that the data can be made public.

3.2.4 The LAA 2018 reports that there were 2,602,000 tonnes of permitted reserves of sand and gravel in the county at 31 December 2017 and 133,000 tonnes sold during that year. A ten year historic average annual sales figure of 111,000 tonnes, gives a landbank of 23.4 years.

West Midlands Aggregate Working Party Annual Monitoring Report

3.2.5 The West Midlands AMR 2016 provides information on sand and gravel permitted reserves and sales from 2007 to 2016, this is represented in Table 3.1 below. However, there are known to be some errors in relation to sand and gravel data in the currently published version of the West Midlands AMR 2016, for example Table 3 of that report indicates that all sales of sand and gravel during years 2012 and 2013 were from Herefordshire, which is not correct. Table 3.1 is provided for completeness, but is not relied upon further within this Update.

Table 3.1 Sand and gravel sales and permitted reserves, Herefordshire and Worcestershire, 2005 to 2016

Year	Permitted reserves[11]		Sales[12]	
	Herefordshire	Worcestershire	Herefordshire	Worcestershire
	Million tonnes			
2007	5.1	4.1	0.19	0.81
2008	6.148	3.021	0.18	0.76
2009	5.15	3.65	0.13	0.52
2010	2.92	4.49	0.11	0.62
2011	2.87	3.85	0.07	0.63
2012	6.57		0.62	no data
2013	6.01		0.66	no data
2014	2.76	2.50	0.10	0.52
2015	2.66	0.54	0.10	0.54
2016	2.54	4.29	0.13	0.39
Total 10 year sales			1.25	5.99
Average 10 year sales			0.13	0.60

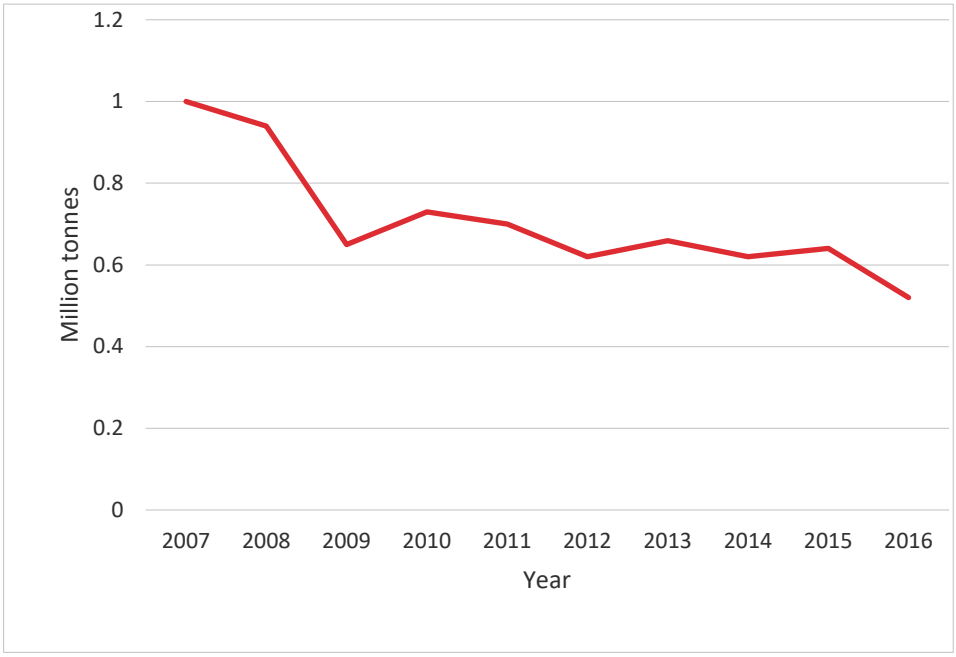
3.2.6 Table 5 of the West Midlands AMR 2016 identifies a 20.26 years landbank for sand and gravel in Herefordshire. Recognising the lack of detail available for minerals data, the difference between this landbank and that identified in the LAA 2018 is not considered to be significant. The LAA 2018 uses more up to date information and consequently is relied upon within this Update.

3.2.7 Figure 3.1 graphically presents the combined sand and gravel sales data for Herefordshire and Worcestershire. Using the data as combined provides useful context to historical sand and gravel sales across the two authorities.

[11] Table 4, West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016

[12] Table 3, West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016

Figure 3.1 Sand and gravel sales, Herefordshire and Worcestershire, 2007 to 2016



3.2.8 The data shows that sales fell significantly in 2008-09, had a brief recovery in 2010, but have since continued to decline over time, notably from 2015. Looking back to 2005, indicates that minerals sales have historically shown some volatility. However, it is likely that the global recession and consequent financial uncertainties has affected sales.

Aggregate Minerals Survey

3.2.9 The supply and destination of sand and gravel from Herefordshire is documented in the MHCLG AMS 2005, 2009 and 2014. Sales of aggregates from Herefordshire in each year and their principal destinations are set out in Table 3.2.

Table 3.2 Sales and principal destination of land-won sand and gravel from Herefordshire, 2005, 2009 and 2014

Destination	2005	2009	2014
	Tonnes		
Herefordshire	156,000	111,000	69,000
Elsewhere in West Midlands	49,000	5,000	24,000
Elsewhere	11,000	6,000	4,000
Unknown	19,000	0	0

3.2.10 The MHCLG AMS 2005, 2009 and 2014 also provide data on the level of import of sand and gravel into the county and consumption within Herefordshire, reproduced in Table 3.3.

Table 3.3 Import and consumption of sand and gravel in Herefordshire, 2005, 2009 and 2014

Year	2005	2009	2014
	Tonnes		
Imports			
Land-won sand and gravel	121,000	63,000	83,000
Marine sand and gravel	12,000	4,000	1,000
Consumption			
Land-won sand and gravel	603,000	174,000	153,000
Marine sand and gravel	12,000	4,000	1,000

3.2.11 Tables 3.2 and 3.3 show a significant drop in sales, import and consumption in 2009 compared to 2005. A significant drop in sales is seen again at 2014, with a limited drop in consumption, but import has slightly increased.

3.2.12 The initial drop in these factors can be explained by the economic recession which began around 2008 and led to a significant reduction in construction and other economic activity. A change of 20,000 tonnes between the 2009 and 2014 data may be due to data inaccuracies and is not considered material; the level of import and consumption can reasonably be considered to be fairly constant. However, the successive drop in sales is more relevant to plan making and may indicate the need for greater robustness in sand and gravel supply.

3.2.13 The figures also show that about half of Herefordshire's consumption is met by imports of sand and gravel from outside of the county. The need for mineral operators to obtain the correct specification for market products, such as ready-mix concrete, can dictate some of this movement where such materials are not available from local deposits.

3.2.14 Herefordshire has no marine reserves, but a small amount is imported into the county, constituting about 1% of total sand and gravel consumption in 2014. Marine aggregates can have special qualities which meet particular specifications.

3.2.15 Annex A presents the BGS prepared consumption of total sand and gravel (land-won and marine-dredged) for aggregate in 2014 identifying for each sub-region the principal supplying Mineral Planning Authorities. This data has not been verified by the BGS, but is the only such available data set. It indicates that Herefordshire was 40% to 50% self-sufficient in sand and gravel provision in 2014, which is also reflected in Table 3.2 and 3.3 above. Sand and gravel is primarily (over 10%) imported from Staffordshire (30% to 40%) and Worcestershire (10% to 20%). The primary export destination is Worcestershire (10% to 20%).

Historic ten year average sales

3.2.16 The LAA 2018 provides historic annual data on sales of sand and gravel in Herefordshire for most of a ten year period. For two of those years (2012 and 2013) the sales data is only available combined with sales in Worcestershire, thus providing significantly higher figures for those years. For these two years, the LAA 2018 assumes that Herefordshire sales of sand and gravel were 13% of the sales in the two counties combined, to enable a ten year average to be calculated.

3.2.17 Table 3.4 gives the current ten years' worth of sales and annual average sales for that ten year period for Herefordshire.

Table 3.4 Ten year sales of sand and gravel in Herefordshire

Year	Sales (Million tonnes)
2007	0.19
2008	0.177
2009	0.125
2010	0.111
2011	0.07
2012	0.081
2013	0.086
2014	0.098
2015	0.102
2016	0.13
2017	0.133
Ten year average	**0.111**

3.2.18 The NPPF seeks a minimum landbank of seven years for sand and gravel provision. With permitted reserves in Herefordshire standing at 2,602,000 tonnes in 2017, a ten year average annual sales figure of 111,000 tonnes gives a landbank of 23.4 years for sand and gravel under current conditions.

3.3 Supply of crushed rock

3.3.1 The picture for crushed rock permitted reserve and sales is unclear due to commercial sensitivities and because of a sequence of discontinuities in the time series data for sales. This is due to changes in the amalgamation of sales data across several different groupings of counties over the ten year period.

LAA 2018

3.3.2 There are only two producers of crushed rock in Herefordshire. Data for reserves and sales of crushed rock from quarries within Herefordshire therefore remains confidential.

3.3.3 Consequently, the LAA 2018 provides data on sales and permitted reserves in 2017 for Herefordshire, Staffordshire, Warwickshire and Worcestershire combined. This is shown in Table 3.5 along with data for previous years from the LAA 2018, which corresponds with data from the West Midlands AMR 2016.

West Midlands Aggregate Working Party Annual Monitoring Report

3.3.4 The West Midlands AMR 2016 provides information on crushed rock permitted reserves and sales from 2007 to 2016, this is represented in Table 3.5 below.

3.3.5 There is recognised to be an error in the currently published version of the West Midlands AMR 2016, such that:

- the ten year total for the combined authorities including Herefordshire should be 9.75mt, not 9.24mt; and
- in Table 5, the landbank should consequently be 206.3 years across the combined authorities (202.14/0.98 = 206.3 years, not 219.72).

Table 3.5 Crushed rock sales and permitted reserves in Herefordshire, Staffordshire, Warwickshire and Worcestershire, 2008 to 2017

Year	Permitted reserves in Herefordshire[13]	Total sales combined [14]
	Million tonnes	
2007	14.60	1.76*
2008	14.40	1.15*
2009	15.00	1.2*
2010	12.20	0.8*
2011	11.00	0.81*
2012	11.79	0.71*
2013	11.54	0.82*
2014	197.92*	0.66*
2015	200.27*	0.61*
2016	202.14*	1.23*
2017	104.21*	1.27*
Total 10 year sales		9.26*
Average 10 year sales		0.93*

* Figures are for Herefordshire, Staffordshire, Warwickshire and Worcestershire combined

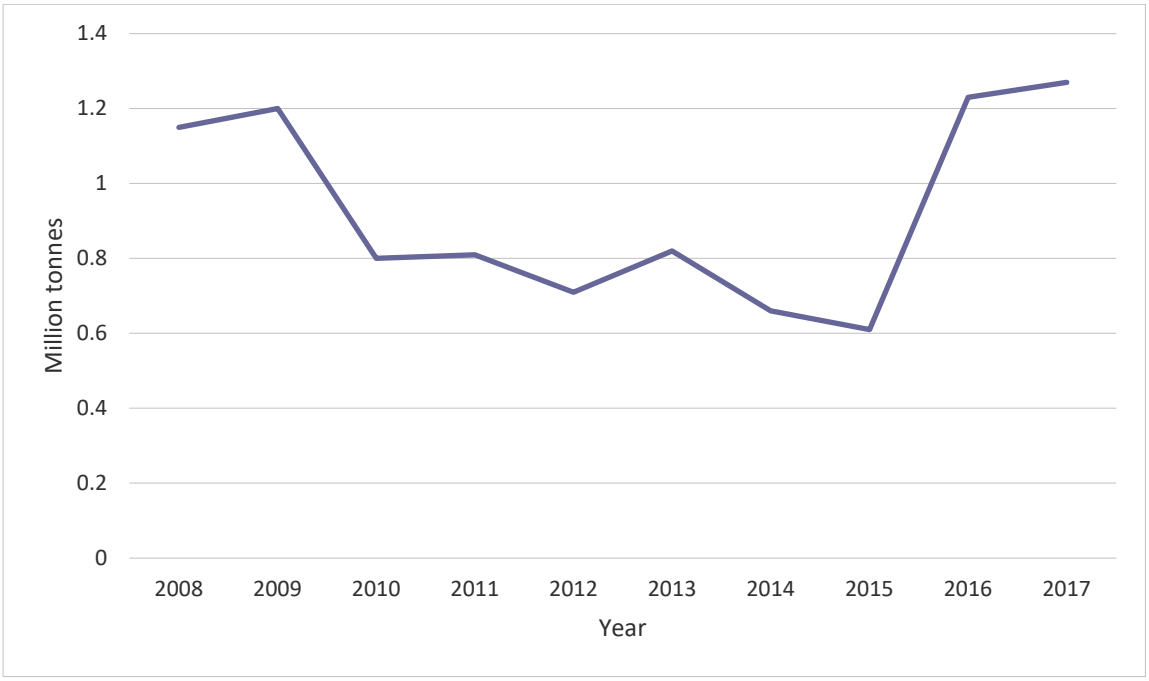
3.3.6 Figure 3.2 shows the above sales data graphically, indicating a period of significant decline from 2009 to 2010 which can be attributed to the economic recession. Sales have continued to decline more gradually, with a slight recovery in 2013 followed by the lowest level of sales over the past 10 years in 2015. In 2016 significant growth was seen and this level of sales was

[13] Table 4, West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016

[14] Table 3, West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016

maintained in 2017. Whilst Figure 3.2 indicates great volatility over the past ten years, over a 5 year period (between 2010 and 2015) the data indicates that sales of crushed rock remained within a variable of about 200,000 tonnes; this would indicate that sales are reasonably consistent and the market had plateaued somewhat. Recent data seems to indicate a recovery from that period toward pre-recession levels.

Figure 3.2 Crushed rock sales in Herefordshire, Staffordshire, Warwickshire and Worcestershire, 2008 to 2017



3.3.7 The NPPF seeks a minimum landbank of ten years for crushed rock provision. Permitted reserves data is presented separately from the other counties only up to 2013, with the preceding years showing some interesting fluctuations. Some disaggregation of this data is required in order to determine a landbank to use for Herefordshire crushed rock reserves.

3.3.8 One method would be to consider the proportion of crushed rock contributed by Herefordshire in 2013 (the most recent year available) to the combined authorities' total in that year.

- Herefordshire crushed rock, 2013: 11.54 million tonnes
- Staffordshire, Warwickshire and Worcestershire crushed rock, 2013 = 188.61 million tonnes[15]
- Total reserve across all counties = 200.15 million tonnes
- Herefordshire proportion = 5.77%

3.3.9 The combined reserve in 2017 is 104.21 million tonnes, 5.77% of which is 6.01 million tonnes, which indicates current crushed rock reserve in Herefordshire.

[15] Table 4, West Midlands Aggregate Working Party, Annual Monitoring Report 2016, incorporating data from January – December 2016

3.3.10 In order to test this approach, and in the absence of other publicly available data to rely upon, a more arbitrary approach has also been used, which seeks also to balance out some of the vagaries present in the data. This approach assumes that, in 2008, there was 14 million tonnes of permitted crushed rock reserve in Herefordshire, and that this has been worked at one million tonnes per year. This is presented in Table 3.6.

Table 3.6 Identifying crushed rock reserve, Herefordshire, 2017

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	Million tonnes									
WM AMR 2016	14.40	15.00	12.20	11.00	11.79	11.54	Not available for Herefordshire only			
Assumed reserve	14.00	13.00	12.00	11.00	10.00	9.00	8.00	7.00	6.00	5.00

3.3.11 This approach presents some alignment with the data of the West Midlands AMR and LAA 2018, but also indicates sales greater than those seen across the combined authorities. It results in a permitted reserve of 5 million tonnes of crushed rock in Herefordshire in 2017.

3.3.12 If sales were really happening at this rate, it would mean that Herefordshire would only have five years of reserve remaining, below the minimum sought in the NPPF. At the site visits both sites were observed to be substantially worked out and both operators indicated a need for extensions in the foreseeable future.

3.3.13 Staffordshire, Warwickshire and Worcestershire County Councils have all used data on crushed rock for combined groupings of counties in their respective Local Aggregate Assessments. In Staffordshire,[16] figures are presented for the landbank for Staffordshire, Herefordshire, Warwickshire, and Worcestershire combined; while in Warwickshire,[17] figures are presented for the landbank for Warwickshire based on the former sub-regional apportionment. The Worcestershire Local Aggregate Assessment[18] states that there are no permitted reserves in Worcestershire.

3.3.14 Herefordshire could take the same approach as Staffordshire and conclude that, as part of a grouping of combined authorities, there is more than sufficient crushed rock reserve for the plan period. However, due to the observation that both quarries within Herefordshire are substantially worked out, this is not a robust approach to take.

3.3.15 It is not possible to report annual sales for crushed rock. Reference to the proportioned approach indicated a landbank of 6.01 million tonnes (or just under 6.5 years) whilst the arbitrary approach would indicate a landbank of 5 years.

3.3.16 This Update relies upon the proportioned approach, identifying 6.01 million tonnes of crushed rock reserve within Herefordshire. This is a more widely recognised and used approach and would appear to be not unrealistic when compared against the arbitrary calculations presented in Table 3.6.

[16] Local Aggregate Assessment, Staffordshire County Council, October 2017

[17] Warwickshire Draft Local Aggregate Assessment 2016, Warwickshire County Council, October 2016

[18] Worcestershire Local Aggregate Assessment, Worcestershire County Council, July 2018

3.3.17 Even if sales of 1 million tonnes per year were occurring (which does not appear to be the case looking at the data from the WM AMR 2016) this would mean that the proportion approach under-estimated Herefordshire's current landbank by just 1 million tonnes, or one and a half years. Recognising the lack of detail available for minerals data, the difference between these two conclusions is not considered to be significant.

Aggregate Minerals Survey

3.3.18 Sales of crushed rock from Herefordshire are confidential due to the small number of operators in the county. However, the DCLG AMS 2005, 2009 and 2014 do provide data for imports and consumption of crushed rock for Herefordshire. These are reproduced in Table 3.7.

Table 3.7 Imports and consumption of crushed rock in Herefordshire

Year	2005	2009	2014
	Tonnes		
Import of crushed rock	1,522,000	421,000	533,000
Consumption of crushed rock	1,691,000	435,000	700,000

3.3.19 The data shows a significant drop in both imports and consumption in 2009 compared to 2005. This can be accounted for by the economic recession which began around 2008 and led to a significant reduction in construction activity. Consumption in 2014 significantly increased, indicating some growth, and whilst imports also increased, this was by a lesser factor, indicating that Herefordshire may have decreased its reliance on crushed rock from elsewhere.

3.3.20 Nevertheless, the data indicates that Herefordshire remains a significant net importer of crushed rock. The need for mineral operators to obtain the correct specification for market products such as ready-mix concrete can dictate some of this movement where such materials are not available from local deposits.

3.3.21 Annex B presents the BGS prepared Consumption of crushed rock for aggregate use in 2014 identifying for each sub-region the principal supplying Mineral Planning Authorities. Again this has not been verified by the BGS, but is the only such available data set. It indicates that Herefordshire was 20% to 30% self-sufficient in crushed rock provision in 2014, which is reflected in Table 3.7 above. Crushed rock is overwhelmingly imported from Powys (40% to 50%) but also from Somerset (10% to 20%).

3.3.22 This indicates that crushed rock travels very much further than sand and gravel, indeed the rail head at Wellington Quarry is used to transport crushed rock from Tarmac quarries in Wales to the south east of England, primarily London. Again, the primary export destination is Worcestershire (10% to 20%) which is known to have little crushed rock reserve.

4. Aggregates, Future Demand

4.1.1 Sections 3.2 and 3.3 indicates that within Herefordshire, under current operations and market conditions, there is an appropriate landbank of sand and gravel, but a potential shortfall of crushed rock.

4.1.2 Looking forward, demand for aggregates can be estimated in a number of different ways. The methods most commonly used are:

- Gross Value Added forecasts;
- population projections;
- household or housing projections; and/or
- Core Strategy infrastructure requirements.

4.1.3 Each of these methods are considered for sand and gravel. It should be remembered that aggregate is more than just sand and gravel, but current information does not enable the same level of analysis to be undertaken for crushed rock.

4.1.4 National policy seeks to promote the use of alternatives to primary aggregates by encouraging the use of recycled aggregates as a substitute. The principal source of recycled aggregates is waste arising from construction and demolition activities. In parallel with this MNA Update 2018, an assessment of the need for waste infrastructure has been undertaken. The WNA Update 2018 has, inter alia, made forecast estimates for the amount of construction and demolition waste arising in Herefordshire annually up to 2031 (and 2035) and these forecasts are reproduced in section 4.4.

Gross Value Added forecasts

4.1.5 Overall growth in the economy can be measured through projected growth in Gross Value Added (GVA). Projected change in GVA could be applied to the most recent sand and gravel annual sales data in order to estimate the potential change in demand for sand and gravel on the basis that it is changes in levels of economic wealth that drive demand for construction of buildings and infrastructure.

4.1.6 Herefordshire's GVA in 2015 was £3,880 million (provisional figure).[19] However, there is little data available on projected GVA for Herefordshire over the timeframe of the Minerals and Waste Local Plan.

4.1.7 Discussions with the Marches Local Enterprise Partnership (LEP)[20] revealed that whilst the LEP had commissioned some work to produce GVA forecasts for the Marches area, no conclusions had been made to inform this Update.

4.1.8 A briefing paper[21] on regional and country economic indicators produced by the House of Commons Library shows the GVA of the West Midlands region in 2016 to be £127 billion. It forecasts that this will grow at an annual average of 1.8% over the period 2018-2028. This

[19] https://factsandfigures.herefordshire.gov.uk/about-a-topic/economy/productivity-and-gross-value-added.aspx

[20] Jacqui Casey, Marches LEP Partnership Manager, 20 January 2017 and Kathryn Jones, 09 April 2018

[21] Regional and Country Economic Indicators: Briefing Paper number 06924, House of Commons Library, October 2018, https://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06924#fullreport

percentage growth rate could be applied to 2017 aggregate sales to estimate the potential demand for aggregates arising from growth in the economy.

4.1.9 The Office for Budget Responsibility (OBR) publishes an economic and fiscal outlook at the national level, the most recent of which [22] was published in March 2018. This produces a range of forecasts for real Gross Domestic Product (GDP) growth from 2017 to 2021.

4.1.10 The OBR outlook reports a central forecast and four higher and four lower forecasts, representing probability bands based on past official forecast errors. Risks to the central forecast include: uncertainties in future changes in levels of private consumption; uncertainty over policies to replace EU policies; risks associated with the large current account deficit; an uncertain outlook for productivity growth; uncertainty over risks to the global economy; and the possibility of recession.

4.1.11 Table 4.1 shows the central GDP growth forecast (50% column) and also a range of eight other growth forecasts for each year, four higher and four lower than the central forecast, to allow for differing degrees of uncertainty in the forecasting.

Table 4.1 Projected annual percentage change in GDP by probability bands

Year	Percentage probability bands								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
2017					1.7				
2018	0.4	0.8	1.1	1.3	1.5	1.8	2.1	2.4	2.9
2019	-1.0	-0.2	0.4	0.8	1.3	1.7	2.1	2.5	3.1
2020	-1.2	-0.3	0.3	0.8	1.3	1.7	2.1	2.6	3.1
2021	-1.3	-0.3	0.3	0.9	1.4	1.8	2.3	2.7	3.3
2022	-1.3	-0.3	0.4	0.9	1.5	1.9	2.4	2.9	3.5

4.1.12 There are other forecasts of economic growth available, notably those produced independently by the information services company Experian. Experian has produced national, regional and county-level forecasts which show projected growth in the whole economy and the construction sector to 2036, which fully incorporate the Minerals and Waste Local Plan plan period. Unfortunately, data for Herefordshire is combined with Worcestershire and is not available separately.

4.1.13 GVA forecasts specific to Herefordshire and Worcestershire were obtained from Experian for the MNA 2017 and have been used again for this Update. The Experian forecast shows projected national GVA over the same period to be lower than compared to their pre-referendum outlook given post-Brexit uncertainties.

[22] Economic and Fiscal Outlook, Office for Budget Responsibility, March 2018, https://obr.uk/efo/economic-fiscal-outlook-march-2018/

4.1.14 Table 4.2 shows the Experian annual forecast growth for Herefordshire and Worcestershire up to 2036, for the whole economy and for the construction sector separately. It also gives five year average growth forecasts for each.

4.1.15 The Experian forecasts to 2025 for the West Midlands are very similar to those forecast by the House of Commons Library briefing paper to 2028 and slightly lower than the central forecast of the Office for Budget Responsibility for national growth to 2022.

4.1.16 The latest forecast from the Construction Products Association[23] is that construction output nationally is forecast to remain flat over the whole of 2018 before accelerating to 2.7% in 2019 and 1.9% in 2020. These figures are very much lower than the Associations' 2016 forecast (referenced in the MNA 2017) and are now closer to the Experian short-term forecast for the sector in Herefordshire and Worcestershire.

4.1.17 There is a relatively wide range of GVA growth forecasts which may be used to calculate future sand and gravel demand.

4.1.18 The OBR outlook is not considered appropriate for two reasons. First, the forecast is for the UK as a whole and therefore gives no localised definition to growth forecasts. Second, the forecast is to 2022 only and provides no indication of how this could be extrapolated up to 2031.

4.1.19 The Construction Products Association forecast is also not pursued further as it is fairly close to the Experian forecast (which has been prepared specifically for Herefordshire and Worcestershire) and there is no indication of how to extrapolate it beyond 2020.

[23] ttps://www.constructionproducts.org.uk/news-media-events/news/2018/april/construction-output-forecast-to-flatline-in-2018/

Table 4.2 Experian forecasts of economic growth for Herefordshire and Worcestershire, 2016 to 2036

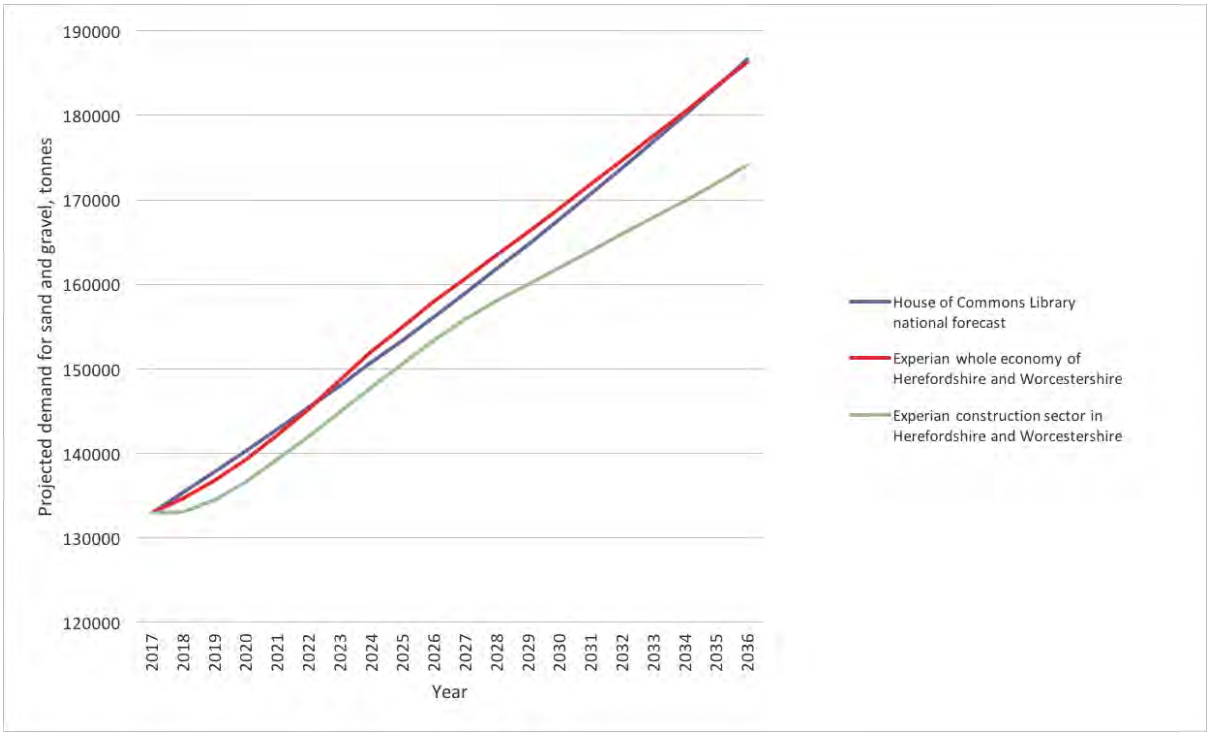
Year	Whole economy	Construction sector
2016	1.4%	-1.5%
2017	0.8%	-0.4%
2018	1.3%	0.0%
2019	1.5%	1.0%
2020	1.9%	1.7%
2021	2.0%	1.9%
2017-21 avg	1.5%	0.9%
2022	2.2%	2.0%
2023	2.4%	2.0%
2024	2.2%	1.9%
2025	2.0%	2.0%
2026	1.9%	1.8%
2022-26 avg	2.2%	2.0%
2027	1.8%	1.6%
2028	1.7%	1.4%
2029	1.6%	1.2%
2030	1.7%	1.2%
2031	1.7%	1.2%
2027-31 avg	1.8%	1.4%
2032	1.7%	1.2%
2033	1.7%	1.2%
2034	1.6%	1.2%
2035	1.6%	1.2%
2036	1.6%	1.3%
2032-36 avg	1.7%	1.2%

4.1.21 The three most relevant forecasts of GVA on which to derive a range of scenarios for future demand for aggregates are:

- The House of Commons Library briefing paper forecast of 1.8% per annum, extrapolated at the same annual growth rate from 2028 to 2036;
- The Experian forecast for the whole economy of Herefordshire and Worcestershire to 2036;
- The Experian forecast for the construction sector in Herefordshire and Worcestershire to 2036.

4.1.22 These growth rates have the benefit of being independent of any one industry, locally focused, but also providing a national comparator. The demand calculated from these GVA forecasts is shown in Figure 4.1.

Figure 4.1 Projected demand for sand and gravel in Herefordshire based on selected GVA forecasts



4.1.23 Using this method, it is calculated that, at 2031, demand for sand and gravel would be between 164,000 to 172,000 tonnes per annum, equating to a ten year annual average in 2031 of between 154,000 and 159,000 tonnes. These figures are slightly higher than those reported in the MNA 2017.

4.1.24 If demand for sand and gravel should rise in line with forecasts for GVA and no additional reserves are permitted, reserves will have fallen to 468,000 tonnes in 2031 if the House of Commons Library national forecast is used (the highest GVA forecast in the near term). A predicted ten year average annual sales figure of 158,000 tonnes in 2031 using this forecast gives a landbank of 3.0 years for sand and gravel. Again, the sales figure is slightly higher than that reported in the MNA 2017 and the reserves figure lower.

4.1.25 The figures in the above two paragraphs are based on the assumption that Herefordshire would continue to be reliant on imports of sand and gravel to meet 54% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in sand and gravel production, then in 2031 demand for sand and gravel would be between 358,000 and 375,000 tonnes and the landbank would have fallen to zero in 2026 (with the House of Commons forecast) if no new reserves are permitted.

4.1.26 This indicates a need for 4,459,000 tonnes of sand and gravel to be permitted throughout the plan period, in order to retain a seven year landbank at 2031, if the House of Commons Library national forecast is used.

4.1.27 It is not possible to generate a forecast for crushed rock using GVA forecasts, because data is not available on current sales to which to apply the GVA multipliers.

Population projections

4.1.28 The (undated) publication Planning 4 Minerals: A Guide on Aggregates, published by the Quarry Products Association, the British Marine Aggregate Producers Association, the BGS and Entec UK Ltd (hereafter referred to as Planning 4 Minerals) suggests that demand for aggregates in the UK is equivalent to a little under 4 tonnes per head per annum. Population projections data can therefore be used to assess the possible implications of population changes for future demand for aggregate.

4.1.29 The latest sub-national population projections were published by the Office for National Statistics (ONS) in May 2018. However, the most recent consumption data is gained from the DCLG AMS 2005, 2009 and 2014. Applying the consumption data provided in these data sets and mid-year population estimates from the ONS for 2005, 2009 and 2014 gives the per capita consumption of aggregates as 13.1 tonnes, 3.4 tonnes and 4.6 tonnes respectively. This calls into question the reliability of applying such multipliers regardless of geography or levels of economic activity.

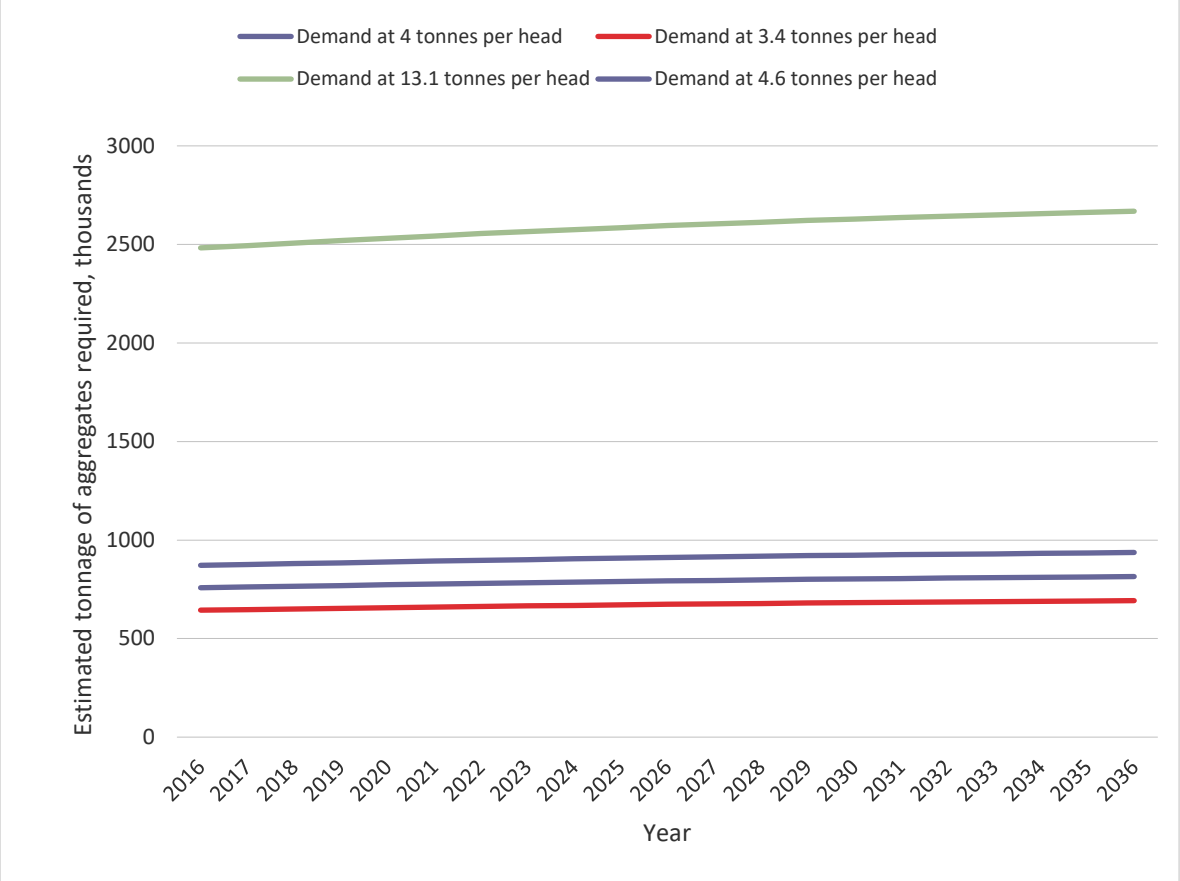
4.1.30 Table 4.3 presents the population projections for Herefordshire by year and the calculated consequent demand for aggregates using each of the rates identified. The assumptions of 4 tonnes, 4.6 tonnes and 3.4 tonnes per head per annum are reasonably consistent; consequently, Table 4.3 includes demand based on 13.1 tonnes per head per annum, as derived from the DCLG AMS 2005. These multipliers have limitations in that the 2009 and 2014 figures take no account of the possibility of an increase in economic vitality in Herefordshire over the period to 2039, while the 2005 figure may overestimate economic vitality in the short to medium term. For each, their long-term accuracy is very unclear.

Table 4.3 Projected population and associated demand

Year	Population (thousands)	Demand at			
		4 tonnes per head	4.6 tonnes per head	3.4 tonnes per head	13.1 tonnes per head
2016	189.5	756.8	870.32	643.3	2478.5
2017	190.4	761.2	875.38	647.0	2492.9
2018	191.3	765.2	879.98	650.4	2506.0
2019	192.3	769.2	884.58	653.8	2519.1
2020	193.2	773.6	889.64	657.6	2533.5
2021	194.1	773.6	894.24	661.0	2546.6
2022	195.0	781.6	898.84	664.4	2559.7
2023	195.8	785.6	903.44	667.8	2572.8
2024	196.6	789.6	908.04	671.2	2585.9
2025	197.3	793.6	912.64	674.6	2599.0
2026	198.1	797.2	916.78	677.6	2610.8
2027	198.8	800.8	920.92	680.7	2622.6
2028	199.4	804.4	925.06	683.7	2634.4
2029	200.1	807.6	928.74	686.8	2644.9
2030	200.6	810.8	932.42	689.2	2655.4
2031	201.2	814.0	936.1	691.9	2665.9
2032	201.7	816.8	939.32	694.3	2675.0
2033	202.2	819.6	942.54	696.7	2684.2
2034	202.7	822.4	945.76	699.0	2693.4
2035	203.2	825.2	948.98	701.4	2702.5
2036	203.7	827.6	951.74	703.5	2710.4
2037	204.1	830.0	954.5	705.5	2718.3
2038	204.6	832.4	957.26	707.5	2726.1
2039	205.0	834.8	960.02	709.6	2734.0

4.1.31 Figure 4.2 presents the four population-based forecasts for aggregate demand. It should be noted that this is total aggregate demand arising from population growth within Herefordshire. This can be met through supply of sand and gravel, crushed rock, and secondary, recycled and marine aggregates, and, continuing a long running trend, this could be from supply outside the county.

Figure 4.2 Estimated tonnages of aggregates required in Herefordshire based on population projections



4.1.32 Using this method, it is calculated that at 2031 an aggregate demand of between 684,000 and 2,636,000 tonnes per annum would be sought, equating to a ten year annual average in 2031 of between 679,000 and 2,615,000 tonnes. Demand would be little different at 2036.

4.1.33 It is considered that the forecast on the basis of 13.1 tonnes of aggregate per head is unrealistically high. The forecast is derived on the basis of pre-recession levels of per capita demand, a time when national GDP growth was as high as 6.7% per annum in the fourth quarter of 2005.[24] Current forecasts indicate that growth over the lifetime of the MWLP is unlikely to return to such high levels and therefore this forecast has been ruled out of further consideration.

4.1.34 Using the forecast on the basis of 4.6 tonnes per head of aggregate, being the highest of the remaining forecasts, the annual aggregate demand in 2031 would be 926,000 tonnes. Assuming 28% of this demand would be met by secondary and recycled aggregates (see paragraph 3.7.1) 666,000 tonnes of primary aggregate would be required to meet this level of demand.

4.1.35 Taking the most recent (2014) data for the proportion of demand met by land-won sand and gravel (18%) and by crushed rock (82%) (see Tables 3.3 and 3.7) 120,000 tonnes of this would be demand for land-won sand and gravel and 546,000 would be demand for crushed rock.

[24] https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/ihyo/ukea

Tables 3.3 and 3.7 further show that 46% of land-won sand and gravel demand and 24% of crushed rock demand was met by production within Herefordshire, which suggests 55,000 tonnes of sand and gravel and 131,000 tonnes of crushed rock would need to be mined within Herefordshire to meet demand assuming levels of import remain the same as currently. These figures are significantly different from those reported in the MNA 2017.

4.1.36 With permitted reserves for sand and gravel in Herefordshire standing at 2,602,000 tonnes in 2017 and sales in 2017 of 133,000 tonnes, the current landbank is 23.4 years for sand and gravel. This would ensure sufficient supply up to 2040 if demand were to stay at current levels. If demand arose in line with population projections, to 55,000 tonnes per annum as estimated in the above paragraph, and no additional reserves are permitted, reserves will have fallen to 1,847,000 tonnes in 2031 (using the forecast based on 4.6 tonnes per head of aggregate demand). A predicted ten year average annual sales figure of 54,000 tonnes in 2031 using this forecast gives a landbank of 34.0 years for sand and gravel.

4.1.37 The figures in the above paragraph are based on the assumption that Herefordshire would continue to be reliant on imports of sand and gravel to meet 54% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in sand and gravel production, then in 2031 demand for sand and gravel would be 120,000 tonnes and the landbank would have fallen to 8.1 years if no new reserves are permitted.

4.1.38 This scenario indicates that no new sand and gravel reserve is required to maintain the seven year landbank at 2031, but it will have fallen to four years by 2035.

4.1.39 Although the current level of supply of crushed rock within Herefordshire is unknown, the total forecast demand for 2018-2031 on the basis of 4.6 tonnes of aggregate demand per head is 1,795,000 tonnes. This figure is substantially higher than that reported in the MNA 2017. Nevertheless, it is significantly below the 11.54 million tonnes of permitted reserves data for 2013, the most recent year for which figures were available for Herefordshire separately from other counties (see Table 3.5) and 6.01 million tonnes assumed reserve for 2017 (see paragraph 3.3.9).

4.1.40 The figures in the above paragraph are based on the assumption that Herefordshire would continue to be reliant on imports of crushed rock to meet 76% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in crushed rock production, and assuming a 6.01 million tonne reserve in 2017, then total forecast demand for 2018-2031 for crushed rock would be 7,479,000 tonnes and the landbank would have fallen to 0 years in 2029 if no new reserves are permitted.

Household projections

4.1.41 Planning 4 Minerals indicates that 60 tonnes of aggregate is required to build a typical house, with around 400 tonnes in total being required when associated infrastructure is taken into account. Household projections data can therefore be used to assess the possible implications of household changes for future demand for aggregate.

4.1.42 The ONS predicts household projections at local authority level, with the most recent published in September 2018[25]. Table 4.4 shows estimated demand on the basis of 400

[25] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/householdprojectionsforengland

tonnes of aggregate required for both housing and associated infrastructure for the increase in households predicted by ONS.

Table 4.4 Household projections and associated demand for aggregates

Year	ONS household projections	Aggregates required (thousand tonnes)
2017	81.570	187.2
2018	82.047	190.8
2019	82.538	196.4
2020	82.989	180.4
2021	83.408	167.6
2022	84.010	240.8
2023	84.589	231.6
2024	85.183	237.6
2025	85.742	223.6
2026	86.277	214.0
2027	86.820	217.2
2028	87.359	215.6
2029	87.877	207.2
2030	88.362	194.0
2031	88.852	196.0
2032	89.323	188.4
2033	89.795	188.8
2034	90.232	174.8
2035	90.668	174.4
2036	91.115	178.8
2037	91.531	166.4
2038	91.943	164.8
2039	92.331	155.2

4.1.43 However, this approach has limitations, in that it takes no account of variations in household type, either between local authority areas or over time in any one authority, both of which can affect the type of housing required, the associated infrastructure and the consequent level of demand for aggregates. Furthermore, it does not allow for changes in construction practices and materials or improvements in resource efficiency in house construction.

4.1.44 An alternative approach would be to look at the housing trajectory set out in the Herefordshire Local Plan Core Strategy 2011-2031 (the Core Strategy) and compare this to historic housing completion rates, available from DCLG statistical tables[26],[27] and Herefordshire's Annual Monitoring Reports (presented in Table 4.5).[28] This comparison can be used to derive a percentage multiplier that can then be applied to the most recent ten year average annual aggregates sales figure in order to project aggregate requirements over the period of the Core Strategy.

Table 4.5 Past housing completions

Year	DCLG statistical tables	Herefordshire AMR
	Number of houses	
2006-07	550	840
2007-08	470	829
2008-09	510	689
2009-10	n/a	547
2010-11	n/a	547
2011-12	260	341
2012-13	160	202
2013-14	280	331
2014-15	310	724
2015-16	250	327
2016-17	190	405
2017-18	340	n/a

4.1.45 This approach is also problematic in Herefordshire, primarily because the past housing completion figures from both Herefordshire and DCLG which correspond to the ten year average annual sales figure are incomplete. Also, this forecast again predicts demand for all aggregates, not just sand and gravel; as is explained in Section 3.3, it has not been possible to derive a figure for the ten year average annual sales for crushed rock for Herefordshire.

4.1.46 In the absence of a percentage multiplier for historic sales data, the Planning 4 Minerals figure of 400 tonnes of aggregate needed for a typical house and associated infrastructure can be applied to the Core Strategy housing trajectory, shown in Table 4.6.

[26] https://www.gov.uk/government/statistical-data-sets/live-tables-on-house-building

[27] It is recognised that managing housing statistics has moved from DCLG/MHCLG to the Office for National Statistics (ONS), and that the ONS has revised both past and forecast housing numbers. This change occurred just as this Update was being finalised. The difference in housing numbers is considered insignificant and unlikely to change the outcome of this Update. Not least as demonstrated in the WNA Update 2018, the most change is likely to be a decrease of demand. This Update continues to rely upon the DCLG data.

[28] https://www.herefordshire.gov.uk/info/200185/local_plan/142/authority_monitoring_reports

4.1.47 Construction accounts for a relatively small percentage of aggregate consumption overall, estimated to be 15% by the Construction Products Association.[29] Other uses include infrastructure, manufacturing and the oil and gas industries. Consequently, Table 4.6 has been prepared to present an estimate for 100% of aggregate demand on the basis of construction accounting for 15% of requirements.

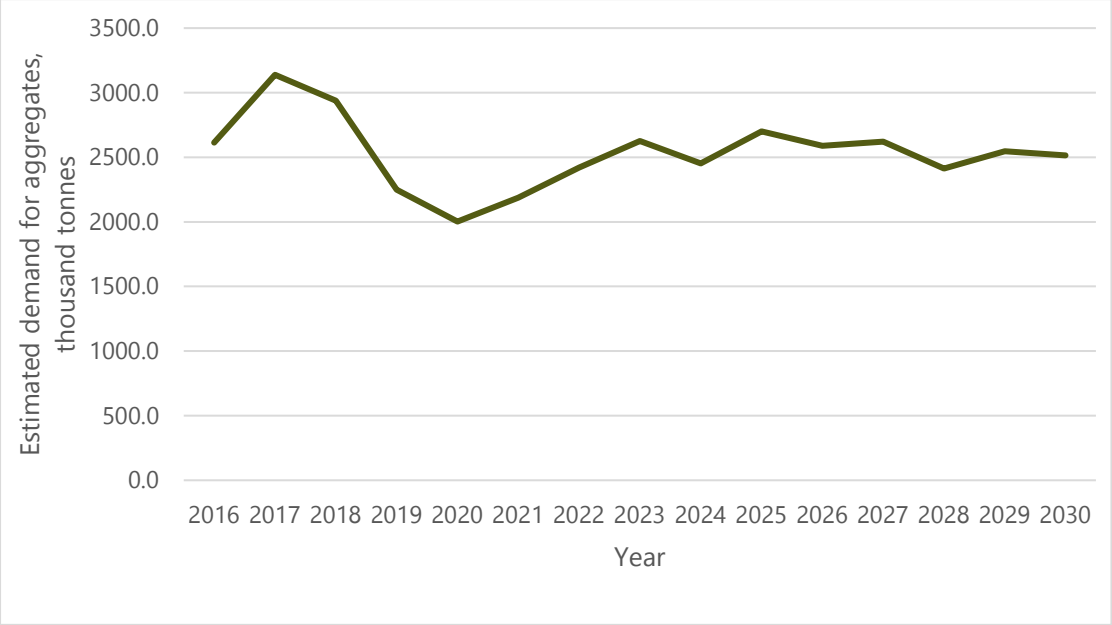
Table 4.6 Herefordshire Core Strategy housing trajectory and associated aggregates demand, 2016/17 to 2030/31

Year	Core Strategy housing trajectory	Construction aggregates demand (15%)	Total aggregates demand (100%)
		Thousand tonnes	
2016/17	980	392.0	2,613.3
2017/18	1177	470.8	3,138.7
2018/19	1102	440.8	2,938.7
2019/20	844	337.6	2,250.7
2020/21	751	300.4	2,002.7
2021/22	820	328.0	2,186.7
2022/23	908	363.2	2,421.3
2023/24	985	394.0	2,626.7
2024/25	920	368.0	2,453.3
2025/26	1013	405.2	2,701.3
2026/27	971	388.4	2,589.3
2027/28	983	393.2	2,621.3
2028/29	905	362.0	2,413.3
2029/30	955	382.0	2,546.7
2030/31	943	377.2	2,514.7

4.1.48 Figure 4.3 shows the projected total aggregate demand in Herefordshire calculated on the basis of the Core Strategy housing trajectory. This analysis can only go to year 2030/31 as this is the plan period for the Core Strategy.

[29] Construction Products Association Press Release 14 April 2014

Figure 4.3 Estimated demand for aggregates in Herefordshire based on Core Strategy housing trajectory



4.1.49 Using this method, it is calculated that in 2030/31 an aggregate demand of 2,515,000 tonnes per annum would be sought, equating to a ten year annual average in 2030/31 of 2,507,000 tonnes.

4.1.50 Assuming 28% of this demand would be met by secondary and recycled aggregates (see paragraph 3.7.1) 1,811,000 tonnes of primary aggregate would be required to meet this level of demand. Taking the most recent (2014) data for the proportion of demand met by land-won sand and gravel (18%) and by crushed rock (82%) (see Tables 3.3 and 3.7) 326,000 tonnes of this would be demand for land-won sand and gravel and 1,485,000 would be demand for crushed rock.

4.1.51 Tables 3.3 and 3.7 further show that 46% of land-won sand and gravel demand and 24% of crushed rock demand was met by production within Herefordshire, which suggests 150,000 tonnes of sand and gravel and 356,000 tonnes of crushed rock would need to be mined within Herefordshire to meet demand. These figures are significantly different from those reported in the MNA 2017.

4.1.52 With permitted reserves for sand and gravel in Herefordshire standing at 2,602,000 tonnes in 2017 and sales in 2017 of 133,000 tonnes, the current landbank is 23.4 years for sand and gravel, which would ensure sufficient supply up to 2040 if demand were to stay at current levels. If demand rose in line with the Core Strategy housing trajectory projections to 150,000 tonnes per annum as estimated in the above paragraph, and no additional reserves are permitted, reserves will have fallen to 678,000 by 2030/31 (the last year of the housing trajectory projections) less than is required for a seven year landbank.

4.1.53 The figures in the above paragraph are based on the assumption that Herefordshire would continue to be reliant on imports of sand and gravel to meet 54% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in sand and gravel production,

then in 2031 demand for sand and gravel would be 326,000 tonnes and the landbank would have fallen to zero by 2026 if no new reserves are permitted.

4.1.54 This indicates a need for 3,855,000 tonnes of sand and gravel to be permitted throughout the plan period, in order to retain a seven year landbank at 2031.

4.1.55 Although the current level of supply of crushed rock within Herefordshire is unknown, the total forecast demand for 2018/19-2030/31 on the basis of the Core Strategy housing trajectory is 4,572,000 tonnes, higher than the same figure reported in the MNA 2017, but still significantly below the 11.54 million tonnes of permitted reserves data for 2013, the most recent year for which figures were available for Herefordshire separately from other counties (see Table 3.5) and 6.01 million tonnes assumed reserve for 2016 (see paragraph 3.3.9).

4.1.56 The figures in the above paragraph are based on the assumption that Herefordshire would continue to be reliant on imports of crushed rock to meet 76% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in crushed rock production and assuming a 6.01 million tonne reserve in 2016, then total forecast demand for 2017-2031 for crushed rock would be 19,050,000 tonnes and the landbank would have fallen to zero in 2022.

Core Strategy Infrastructure Requirements

4.1.57 The infrastructure requirements arising from policies in the Core Strategy have been examined, with reference to Appendix 5, which lists the necessary infrastructure for strategic sites, as well as to the text of the Core Strategy itself. The main infrastructure proposals which could have a significant demand for aggregates within the period of the MWLP have been identified and these are listed in Table 4.7.

4.1.58 Table 4.7 also shows the main infrastructure proposals that were planned by the earlier Herefordshire Unitary Development Plan[30] for comparative purposes.

4.1.59 No data is available to enable estimates to be made of the likely demand for aggregates arising from the construction of the development. However, Table 4.7 shows that the infrastructure needs arising from the Core Strategy are similar in nature and scale to those arising from the Unitary Development Plan. There is therefore no indication to suppose that there will be a significant change in the demand for aggregates over the life of the Core Strategy when compared to the period since the adoption of the Unitary Development Plan.

[30] Herefordshire Unitary Development Plan, Herefordshire Council, March 2007

Table 4.7 Planned infrastructure in Herefordshire with a potentially significant aggregate requirement

Unitary Development Plan 1996-2011	Core Strategy 2011-2031
12,200 dwellings over plan period (813 dpa) 800 dpa 2001-2007 600 dpa from 2008 onwards	16,500 dwellings over plan period (825 dpa) 600 dpa 2011-2016 850 dpa 2016-2021 900 dpa 2021-2026 950 dpa 2026-2031
100 ha of Part B employment land	148 ha of employment land
14-16,000m^2 of retail floorspace	
11-15,000m^2 of retail warehouse floorspace	
12-14,000m^2 of office floorspace	
Edgar Street Grid: A new canal basin (residential, commercial, leisure, bars, hotel) A new civic quarter (public offices, library, retail, leisure, visitor amenities) Modernisation and relocation of Hereford United FC Multiplex cinema	New urban village in Eign Gate and Edgar Street regeneration areas including: canal basin leisure and recreation facilities Redevelopment of Hereford United FC New police headquarters Divisional Fire Brigade headquarters
Public transport interchange	Purpose-built transport hub
New road link between Edgar Street and Commercial Road Extension of Canal Road to provide a new route between the station and city centre Downgrade inner ring road New road link A49 to B4399 Extending Roman Road improvements from A480 to A438 Improvements to eastern section of Roman Road New road link across northern half of Edgar Street regeneration area Leominster Enterprise Park access roads Ledbury bypass extension	Western Hereford Relief Road with second river crossing Upgrade to inner ring road Leominster southern link road New road infrastructure for lower Bullingham New roundabout for Rotherwas Access Road Road link in Leominster linking B4361 to A44 New roundabout and road link on periphery of development at Bromyard
Park and ride schemes will be permitted	3 park and ride facilities
Land for enhancing capacity of rail network will be safeguarded	Additional capacity on rail through passing loops or double track on Hereford to Great Malvern section
Cycling and pedestrian links	Cycling and pedestrian links

4.2 Conclusions for sand and gravel

4.2.1 Section 4.1 sets out a number of forecasts for future sand and gravel demand using a range of forecasts based on GVA growth, on population projections and on the Core Strategy housing trajectory. Table 4.8 summarises the estimates calculated on the basis of a selection of these forecasts.

Table 4.8 Main findings from selected forecasts of sand and gravel demand, assuming current level of import

Current level of import Scenario	At year 2031			Tonnage required to maintain 7 year landbank
	Demand (tonnes)	Permitted reserve (tonnes)	Landbank	
GVA growth (House of Commons forecast)	171,000	468,000	3.0 years	636,000
Population growth, demand at 4.6 tonnes of aggregate per head	55,000	1,847,000	34.0 years	0
Core Strategy housing trajectory	150,000	678,000	4.5 years	368,000
Current level of import Scenario	**At year 2035**			**Tonnage required to maintain 7 year landbank**
	Demand (tonnes)	**Permitted reserve (tonnes)**	**Landbank**	
GVA growth (highest)	183,000	0	0 years	1,432,000
Population growth, demand at 4.6 tonnes of aggregate per head	56,000	1,625,000	29.5 years	0
Core Strategy housing trajectory	n/a	n/a	n/a	n/a

4.2.2 Table 4.8 shows that, depending on the forecast method used, there may be sufficient permitted reserves of sand and gravel remaining for the lifetime of the MWLP, or there may be an insufficient landbank remaining at the end of the plan period. By 2035, if the highest GVA growth projection is used, the landbank will have fallen to zero. Using population growth as the basis for a forecast, the landbank would still be sufficient in 2035.

4.2.3 The figures in Table 4.8 are calculated based on the assumption that Herefordshire would continue to be reliant on imports of sand and gravel to meet 54% of its needs, a figure taken from the AMS 2014. If Herefordshire were to be self-sufficient in sand and gravel production, the projections would be as set out in Table 4.9.

Table 4.9 Main findings from selected forecasts of future sand and gravel demand, assuming self-sufficiency in sand and gravel production

Self-sufficient Scenario	At year 2031			Tonnage required to maintain 7 year landbank
	Demand (tonnes)	Permitted reserve (tonnes)	Landbank	
GVA growth (highest)	372,000	0	0 years	4,459,000
Population growth, demand at 4.6 tonnes of aggregate per head	120,000	960,000	8.1 years	0
Core Strategy housing trajectory	326,000	0	0 years	3,855,000
Self-sufficient Scenario	**At year 2035**			**Tonnage required to maintain 7 year landbank**
	Demand (tonnes)	**Permitted reserve (tonnes)**	**Landbank**	
GVA growth (highest)	400,000	0	0 years	6,195,000
Population growth, demand at 4.6 tonnes of aggregate per head	121,000	476,000	4.0 years	360,000
Core Strategy housing trajectory	n/a	n/a	n/a	n/a

4.2.4 If Herefordshire was to be self-sufficient in sand and gravel, Table 3.16 shows that only the forecast using population growth as a basis predicts a sufficient landbank for sand and gravel in 2031 if no new reserves are permitted, and this will fall below the minimum 7 year requirement by 2035.

4.2.5 It is acknowledged that these forecasts have been produced using a number of assumptions, some based on data for single years and some on data now a few years old. However, if during the course of the development of the MWLP better data becomes available, as has been found since the MNA 2017, this can be used to improve the forecasts produced wherever appropriate.

4.2.6 There is one active sand and gravel quarry in Herefordshire with permitted reserves constituting over half the total permitted reserves within the county. Current planning conditions require that the winning and working of minerals must cease by 31 December 2026. Therefore, regardless of which forecast most closely represents the real outcome for sand and gravel over the lifetime of the MWLP there will be a need for additional reserves of sand and gravel to become operational to meet demand from 2027 onwards.

4.3 Conclusions for crushed rock

4.3.1 There is, generally, a lack of data in relation to crushed rock within Herefordshire.

4.3.2 Two methods have been considered for forecasting the potential future demand. These have produced widely varying forecasts of demand for 2017-2031. Calculations have been made for two different scenarios, on the basis of whether Herefordshire continues to rely on imports of crushed rock to meet 76% of its needs, and on the basis of Herefordshire being self-sufficient in crushed rock production. The forecasts are set out in Table 4.10.

Table 4.10 Main findings from selected forecasts of future crushed rock demand, assuming current level of import and self-sufficiency

Scenario	Assuming imports at current level		Assuming self-sufficiency	
	Demand 2018-2031	Demand 2018-2035	Demand 2018-2031	Demand 2018-2035
Population growth, demand at 4.6 tonnes of aggregate per head	1,795,000	2,323,000	7,479,000	9,678,000
Core Strategy housing trajectory	4,572,000	n/a	19,050,000	n/a

4.3.4 Table 4.10 shows that, depending on the forecast used, demand for crushed rock could exceed even the 11.54 million tonnes of permitted reserves data for 2013, the most recent year for which figures were available for Herefordshire separately from other counties (see Table 3.5).

4.3.5 It is acknowledged that these forecasts have been produced using a number of assumptions, some based on data for single years and some on data now a few years old. However, if during the course of the development of the MWLP better data becomes available, as has been found since the MNA 2017, this can be used to improve the forecasts produced wherever appropriate.

4.3.6 Of the two operational quarries for crushed rock in Herefordshire, one is required to cease operations by 2027, and therefore could not, currently, contribute to meeting demand after that date. The other can continue operations until 2042. There may therefore be a need for additional reserves of crushed rock to become operational during the lifetime of the MWLP.

4.4 Secondary and recycled aggregates

4.4.1 The Mineral Products Association[31] estimates that secondary and recycled aggregates constitute 28% of total aggregate consumption in GB in 2015.

4.4.2 There are currently no industrial processes in Herefordshire which are known to produce secondary aggregates.[32] With technical improvements, there may be potential for some provision of secondary aggregates from existing quarrying operations. Although technology is moving apace in this field, at present however, none is proposed. It is also understood, from the site visits, that some hard rock dust from quarries in Wales is used in concrete block manufacture within Herefordshire.

4.4.3 Recycled aggregates are currently being produced within Herefordshire, principally at the CD&E waste recovery facility at Former Lugg Bridge Quarry.

4.4.4 The WNA Update 2018 (paragraph 4.4.25) has produced two forecasts for arisings of CD&E waste in Herefordshire based on the forecast change in GVA for the construction sector in Herefordshire and Worcestershire produced by Experian. The two forecasts are:

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

4.4.5 The forecasts were broken down into the key elements of the CD&E waste stream (non-hazardous construction and demolition waste, hazardous construction and demolition waste and dredging and excavation spoils) based on relative proportions estimated in 2014 and assuming that these remain constant. In this way, two forecasts for arisings of non-hazardous construction and demolition waste have been made, this being the particular element of the CD&E waste stream likely to be a source of recycled aggregates.

4.4.6 However, not necessarily all of the arisings will be recovered for recycling. The latest figures from Defra[33] shows that 91.4% of non-hazardous construction and demolition waste was recovered in England in 2014 and 89.9% for the UK as a whole. Therefore, in considering this data for minerals purposes the arisings forecast by the WNA Update 2018 have been reduced in accordance with these rates. The adjusted forecasts are set out in Table 4.11 and presented in Figure 4.4.

[31] The Mineral Products Industry At A Glance: 2016 Edition, Mineral Products Association, 2016, http://www.mineralproducts.org/documents/Mineral_Products_Industry_At_A_Glance_2016.pdf

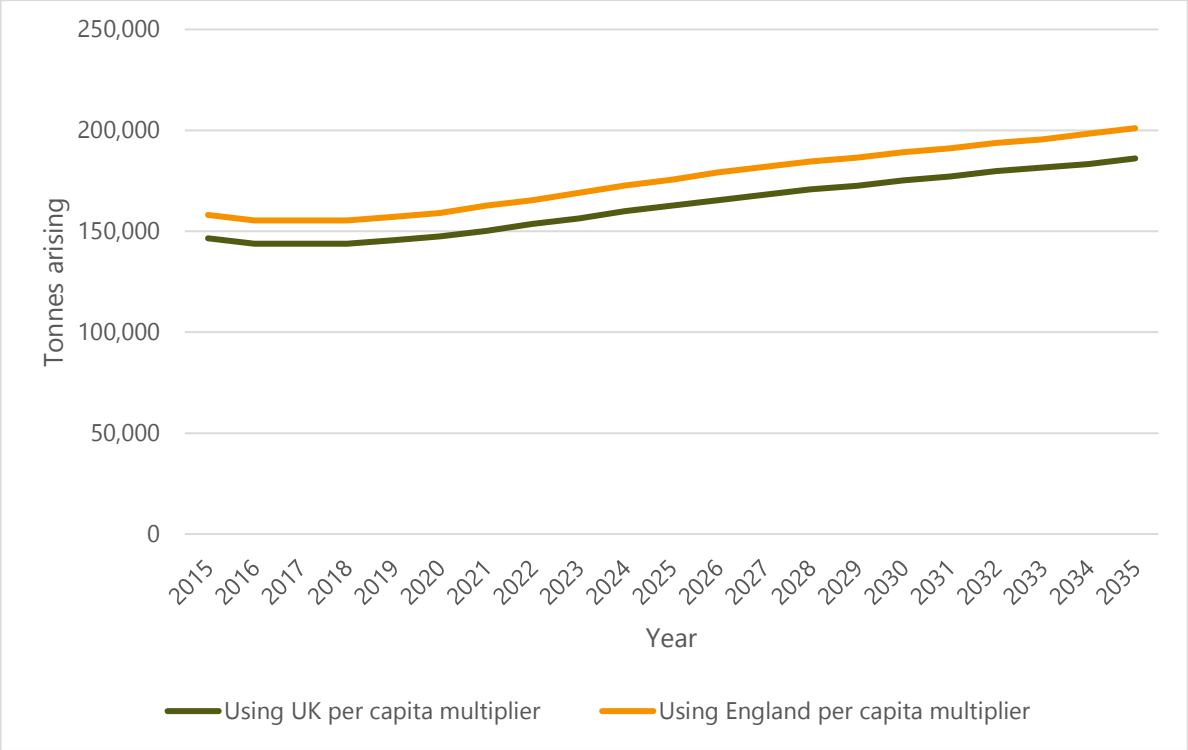
[32] Herefordshire Local Aggregates Assessment December 2014 v.1.3 draft, Herefordshire Council, December 2014

[33] Statistics on Waste Notice: Non-Hazardous Construction and Demolition Waste UK and England 2010-2014, Defra, December 2016

Table 4.11 Forecast arisings of recovered non-hazardous construction and demolition waste, Herefordshire, 2015 to 2035

Year	Using a UK per capita multiplier	Using an England per capita multiplier
2015	146,537	158,122
2016	143,840	155,380
2017	143,840	155,380
2018	143,840	155,380
2019	145,638	157,208
2020	147,436	159,036
2021	150,133	162,692
2022	153,729	165,434
2023	156,426	169,090
2024	160,022	172,746
2025	162,719	175,488
2026	165,416	179,144
2027	168,113	181,886
2028	170,810	184,628
2029	172,608	186,456
2030	175,305	189,198
2031	177,103	191,026
2032	179,800	193,768
2033	181,598	195,596
2034	183,396	198,338
2035	186,093	201,080

Figure 4.4 Forecast arisings of recycled aggregates, Herefordshire, 2015 to 2035



4.4.7 The forecasts indicate that up to 200,000 tonnes of recycled aggregates could be gained from non-hazardous construction and demolition waste in Herefordshire by 2035. In simple terms, i.e. not considering all the different recycled aggregates produced, this could be provided by the proposed extensions to the operations undertaken at the Former Lugg Bridge site.

5. Other Minerals

5.1 Building Stone

5.1.1 The Annual Raised Enquiry prepared by the ONS provides data for building stone sales from Herefordshire. The last four years of data are reproduced in Table 5.1. Prior to 2011, data on building stone was only provided at the regional level.

Table 5.1 Sales of building stone, Herefordshire, 2011 to 2014

Year	Building stone sales (tonnes)
2014	2,000
2013	2,000
2012	2,000
2011	2,000*

* Figure for Herefordshire and Worcestershire combined

5.1.2 The figures indicate a small and stable market for the sale of building stone from Herefordshire.

5.1.3 There are several active quarries for building stone within Herefordshire. Some of these have planning conditions imposed which require operations to cease within the lifetime of the MWLP. Llandraw Delve is required to cease working by 2021 and Tybubach Delve by 2030 at the latest (this site already appears to have ceased working). Westonhill Wood Delves are required to cease working by 2039, beyond the plan period. Therefore, with the closure of some quarries before the end of the plan period, there may be a need to facilitate new permissions, or extended time periods, for the winning and working of building stone.

5.2 Conventional and Unconventional Hydrocarbons

5.2.1 Herefordshire has two areas that have been worked in the past for coal. However, such conventional extraction of hydrocarbons has ceased in Herefordshire and shows little sign of recommencing. In 1999, the BGS reported that the hydrocarbon prospectivity of the area was low.

5.2.2 Recently, new technologies have been developed for extracting hydrocarbons in an unconventional way, which may allow the extraction of resources from deposits which were previously considered uneconomic.

5.2.3 The UK has a long history of onshore gas exploration, and has developed a robust regulatory system to ensure that any such operations will be carried out to the highest standards of safety and environmental protection. The 14th Onshore Oil and Gas Licensing Round was launched on 28 July 2014 and applications were received from 47 companies covering 295 Ordnance Survey Blocks.

5.2.4 A Petroleum Exploration and Development Licence (PEDL) does not itself give any direct permission for operations to begin, but grants the licensee exclusivity over an area of land for

onshore hydrocarbon exploration, appraisal and extraction. The exclusivity applies to both conventional and unconventional operations.

5.2.5 The PEDL are issued for an identified block of land, one of which, referred to as SO51a, included a small part of the south of Herefordshire around Whitchurch, Welsh Newton, Goodrich, Kerne Bridge, Hope Mansell and Marstow. The PEDL for block SO51a is classified as coalbed methane, although the licence is for any hydrocarbon and is not limited to this classification. It was offered to South West Energy Limited, but the Oil and Gas Authority has confirmed that the licence was not taken up, and therefore no PEDL was awarded in this area. It is possible that the block could be subject to future licensing rounds, although the Oil and Gas Authority has not been able to provide any timeframe for that.[34]

5.2.6 Activities related to hydrocarbon exploration or extraction will therefore not take place in Herefordshire, at least in the short term. It is therefore still possible, although perhaps unlikely, that hydrocarbon operations will take place in Herefordshire within the plan period, although this may depend on future developments in technology that could make the deposits more attractive.

[34] Email exchange with OGA, March 2018

6. Conclusions

6.1 Overview

6.1.1 The previous sections have collated and analysed the available additional data on supply of and demand for minerals in Herefordshire and combined these with the data already used, where appropriate. In many instances, data is unavailable and estimates have had to be made using assumptions based on information from other sources or from several years ago. While every attempt has been made to use reliable data, the figures derived can only be an indication of the actual position regarding supply of minerals, except in the cases of sand and gravel and building stone where actual figures are available.

6.1.2 When making projections of future demand, especially over a 15 to 20 year time-frame, estimates are by their nature uncertain and the true outcome is uncertain. A range of forecasts have been made to show the possible variation in outcome

6.1.3 On the basis of the estimates derived for supply and demand, it is possible to draw some conclusions about the balance between supply and demand for minerals. These conclusions have changed considerably from the MNA 2017, reflecting the incorporation of new and updated information.

6.2 Aggregates

Sand and gravel

6.2.1 Clear data is held on the supply of sand and gravel and permitted reserves remaining.

6.2.2 In most of the scenarios considered, additional sand and gravel reserve is required to maintain a seven year landbank at 2031 and 2035.

6.2.3 Regardless of the demand forecast used, the single active quarry must cease operations by the end of 2026 under current planning conditions. This quarry's permitted reserves constitute over half of the total permitted reserves within the county. There is therefore a need for additional reserves of sand and gravel to become operational before the end of the MWLP.

Crushed rock

6.2.4 Poor data is held on the supply of crushed rock and permitted reserves remaining.

6.2.5 Two methods have been provided for forecasting the potential future demand for crushed rock. These have produced widely varying forecasts of demand for 2017-2031. However, in both cases the forecast is significantly below the tonnes of permitted reserves data for 2013, the most recent year for which figures were available for Herefordshire separately from other counties. This assumes that Herefordshire continues to rely on imports of crushed rock at current levels.

6.2.6 If Herefordshire were to be self-sufficient in crushed rock production, then under one forecast demand would outstrip the available permitted reserves extant in 2013.

6.2.7 Of the two operational quarries for crushed rock in Herefordshire, one is required to cease operations by 2027. There may therefore be a need for additional reserves of crushed rock to be permitted during the lifetime of the Minerals and Waste Local Plan, but as the picture on

reserves and sales within the county is unclear, it is not possible to know with any degree of certainty how important it will be to secure additional permitted reserves through new policy.

Recycled aggregates

6.2.8 Herefordshire is a net importer of aggregates, and overwhelmingly so for crushed rock. As discussed above, there is an identified need to secure more permitted reserves for both sand and gravel and crushed rock reserves. Recycled aggregates could have an increasingly important role to play in reducing the reliance on imports of aggregates.

6.2.9 Forecasts have been made for the potential arisings of recycled aggregates over the plan period. These have been calculated using a baseline of per capita arisings in Herefordshire and assumed to change over the Plan period in line with forecasts for the change in GVA for the construction sector in Herefordshire and Worcestershire.

6.2.10 This gives a baseline for arisings of recycled aggregates in 2015 of between 147,000 tonnes and 158,000 tonnes, rising to between 177,000 tonnes and 191,000 tonnes by 2031. While a useful contribution to the supply of aggregates, these figures fall well short of the predicted tonnages required to meet the estimated demand calculated by reference to the Core Strategy housing trajectory.

6.3 Building stone

6.3.1 Clear data is held on the supply of building stone and permitted reserves remaining.

6.3.2 There is a small and stable market for the sale of building stone from Herefordshire. This is important for retaining the local character of buildings and also has a market for quality construction in other parts of the country.

6.3.3 Some of the active delves for building stone within Herefordshire are required to cease operations within the lifetime of the Minerals and Waste Local Plan. Therefore there may be a need for policy to address the winning and working of building stone to enable supply to continue to meet demand.

6.4 Hydrocarbons

6.4.1 There will not be any activities relating to the exploration or extraction of hydrocarbons within Herefordshire in the short term.

6.4.2 In the medium to long term, it is possible that this situation may change but there is no information to indicate how likely this is.

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Kirsten Berry and Hilary Livesey **authors**

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