

West Sussex Joint Minerals Local Plan

**Assessment of Need for Aggregates:
Local Aggregate Assessment 2019**

May 2020



Working in Partnership



West Sussex Joint Minerals Local Plan Assessment of Need for Aggregates Local Aggregate Assessment 2019 (May 2020)

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Executive Summary

The National Planning Policy Framework (NPPF) requires Mineral Planning Authorities (MPAs) to prepare an annual Local Aggregates Assessment (LAA)¹ which is an evidence base document that sets out the potential demand, and assessment of potential supply, of aggregates within their area. This joint LAA has been prepared by West Sussex County Council (WSCC) and the South Downs National Park Authority (SDNPA), and provides evidence to support the West Sussex Joint Minerals Local Plan (JMLP).

Chapter 1: Introduction

This chapter explains the background to the Managed Aggregate Supply System (MASS) and the requirement for MPAs to prepare an LAA. It explains how the LAA informs and supports the JMLP, which has been prepared jointly by WSCC and the SDNPA. The LAA incorporates the findings from the latest round of evidence gathering during 2019. This evidence includes that which shows how 'other relevant local information' influences the estimated demand and supply of aggregates through the life of the JMLP (to 2033).

Chapter 2: Aggregates in West Sussex

This chapter sets out the past to current demand for, and supply of, aggregates in West Sussex from each different source in turn; the key findings are set out within the 'Dashboard' below.

Chapter 3: Balance between Demand and Supply

This chapter summarises the supply of aggregates from different sources and allows for a comparison of the different supply options based on relevant local information. It concludes that:

- existing permitted reserves of land-won sharp sand and gravel exceed a forecasted demand value, which is based on 10-year average sales and local relevant information for the plan period;
- safeguarded wharves, railheads, and recycled aggregate sites will continue to be the majority sources of supplies for sharp sand and gravel;
- safeguarded wharves and railheads will continue to provide the importation infrastructure through which the supplies of crushed rock are imported;
- soft sand resources are constrained by being situated in the South Downs National Park (or its setting). Existing reserves are sufficient to supply soft sand at levels equivalent to the 10-year average sales for 7.7 years, and, taking account of relevant local information, for 6.0 years.

¹ See paragraph 207(a) of the NPPF.

West Sussex LAA Dashboard 2019

Source	2018 Sales (mt) (2017 in brackets)	Trend (previous year sales)	10-year Avg Sales (mtpa) (2009-2018)	3-year Avg Sales (mt) (2016-2018)	LAA Rate (mtpa) ²	Reserves (mt)	Landbank (years) (based on LAA Rate)	Capacity (mtpa)	Comments
Sharp Sand and Gravel	Confidential (Confidential)	↑ Up	0.023	0.084	0.036 ³	0.795	22	0.250	Incidental sales from one soft sand quarry in 2018.
Soft Sand	0.306 (0.282)	↑ Up	0.289	0.316	0.372	2.300	6.2	0.502	
Recycled/ Secondary Aggregates	0.391 (0.393)	↓ Down	0.444	0.421	0.444			0.529	Data derived from EA WDIs and reporting on 2018/19. Survey response rates too low for accurate figures.
Marine Sand and Gravel (landings)	1.319 (1.307)	↑ Up	1.106	1.293	1.737			2.070 ⁴	Headroom capacity of 0.167mtpa (using updated LAA rate).
Rock Imports by Sea	0.090 (0.164)	↓ Down	0.106	0.097	0.166			2.070 ⁴	Headroom capacity of 0.167mtpa (using updated LAA rate).
Rail Depot Sales (sand and gravel)	0.108 (0.084)	↑ Up	0.117	0.090	0.184			1.380 ⁵	Headroom capacity of 0.238mtpa (using updated LAA rate).
Rail Depot Sales (crushed rock)	0.675 (0.568)	↑ Up	0.610	0.599	0.958			1.380 ⁵	Headroom capacity of 0.238mtpa (using updated LAA rate).

² The LAA rates applied are those which show the highest theoretical requirement per annum (i.e. the 10-year average + the highest demand scenario).

³ The three-year average is more than 50% higher than the LAA rate. The landbank based on the three-year average is 9.5 years and therefore there would be a theoretical shortfall to 2033 of 0.38mt.

⁴ Maximum capacity of wharves in West Sussex.

⁵ Maximum capacity of railheads in West Sussex.

1. Introduction

1.1 The Managed Aggregate Supply System

- 1.1.1 Aggregates are used for the construction of homes, commercial development, and infrastructure (such as roads). It is therefore important that nationally there is an adequate and steady supply to ensure economic development and quality of life. The Managed Aggregate Supply System (MASS) has been the mechanism to ensure there has been an adequate supply of aggregates (sand, gravel, and crushed rock) in England for over 35 years.
- 1.1.2 Minerals can only be worked where they occur, and their extraction can potentially cause conflict through loss or changes to valued landscapes. The MASS system was developed due to the geographical imbalance of aggregates and ensures Mineral Planning Authorities (MPAs) make an appropriate contribution to the national need for aggregates as well as local supply. As part of the MASS system, each MPA is required to prepare a Local Aggregate Assessment (LAA) which assesses the demand and supply of aggregates in its area on an annual basis. LAAs can be prepared jointly by more than one authority.

1.2 What is a Local Aggregate Assessment?

- 1.2.1 The requirement for MPAs to prepare a LAA is set out in the National Planning Policy Framework (NPPF) and the national Planning Practice Guidance (PPG). Paragraph 62⁶ of the PPG states that LAA should cover the following:
- “A forecast of the demand for aggregates based on both the rolling average 10-year sales data and other relevant local information;
 - An analysis of all aggregate supply options, as indicated by landbanks, mineral plan allocations, and capacity data, e.g. marine licences for marine aggregate extraction, recycled aggregates, and the potential throughput from wharves. This analysis should be informed by planning information, the aggregate industry, and other bodies such as local enterprise partnerships; and
 - An assessment of the balance between demand and supply, and the economic and environmental opportunities and constraints that might influence the situation. It should conclude if there is a shortage or surplus of supply and, if the former, how this is being addressed.”
- 1.2.2 The national PPG, Paragraph 64⁷, states that the LAA “must also consider other relevant local information in addition to the 10-year rolling supply”, and this information may include “levels of planned construction and house building”, as well as considering average sales over the last three years to identify general trend of demand.

⁶ PPG Paragraph: 062. Reference ID: 27-062-20140306.

⁷ PPG Paragraph: 064. Reference ID: 27-064-20140306.

- 1.2.3 This LAA incorporates the findings from further evidence gathering that has considered 'other relevant local information' that may influence the demand of aggregates through the life of the Joint Minerals Local Plan (JMLP) (to 2033). This information, including anticipated levels of construction of homes and the maintenance and construction of roads, has been used to underpin a number of differing aggregate demand scenarios.
- 1.2.4 While there are many end users of aggregates, many of these can be related to housing growth which are partially driven by demographic trends. Therefore, housing trends are considered to provide a useful indicator for trends in demand for other users of aggregates. Data and evidence on the future construction of homes therefore provide a sound baseline from which to assess possible future demand scenarios. Furthermore, information on planned highways works (maintenance and improvement) have also been considered as they consume aggregates (generally crushed rock).

1.3 West Sussex Joint Minerals Local Plan

- 1.3.1 The West Sussex Joint Minerals Local Plan (JMLP) was adopted in July 2018. During the examination of the JMLP, the Planning Inspector indicated that modifications were required to the submitted Plan to address issues of 'soundness' related to the supply of soft sand. The adopted Plan includes a commitment to prepare a formal single issue review of soft sand to be begun within six months of adoption of the JMLP, and to be submitted for examination within two years of commencement of the review.
- 1.3.2 The JMLP takes account of evidence such as changes in relation to the demand and supply of minerals in West Sussex as well as government minerals planning policies (included in the NPPF) and the establishment of the South Downs National Park Authority in 2011. The Plan includes a vision; strategic objectives; a suite of strategic policies; a strategic site; and development management policies.
- 1.3.3 Previous versions of the LAA, dating back to 2014, informed the preparation of the Plan by setting out a forecast for the demand for aggregates over the Plan period and indicated what other local issues are likely to influence the ability of needs for aggregates to be met from minerals resources and facilities in West Sussex. The LAA is updated annually and provides the latest aggregates situation, to support the determination of planning applications for aggregate proposals.

1.4 National and Regional Context

National and Regional Guidelines for Aggregates Provision

- 1.4.1 LAAs are used by MPAs, including National Park Authorities, to help them plan for a steady and adequate supply of aggregates. In doing so MPAs participate in, and take the advice of, an Aggregate Working Party (AWP), a technical advisory group of MPAs and relevant organisations, which has the following role:
- to consider, scrutinise and provide advice on the LAAs of MPAs;

- to provide an assessment of the overall demand and supply for the AWP area, including whether the area is making a full contribution towards meeting national and local aggregate needs;
 - to obtain, collect, and report in data on minerals activity in their area, including annual data collected by the MPAs on sales, permissions, and reserves of aggregates (including recycled and secondary sources).
- 1.4.2 West Sussex and the South Downs National Park Authority fall within the South East England Aggregate Working Party (SEEAWP) area.
- 1.4.3 As part of the MASS, the amount of land-won aggregates to be provided by each region was set out in the [National and Regional Guidelines for Aggregates Provision in England 2005-2020](#) (June 2009). MPAs may decide, collectively, to plan for more or less than set out in the Guidelines based on their LAA but this must be supported by robust evidence and be properly justified, having regard to the local and national need.
- 1.4.4 The data used in this LAA includes that from the National Aggregate Minerals Survey, which was carried out for the year 2015. A further national survey has not taken place; therefore, information on imports and exports has not been updated.

Policy on National Parks

- 1.4.5 In West Sussex a significant proportion of the sand and gravel resources are within, or in the setting of, the South Downs National Park (SDNP), and so national policy on development in National Parks needs to be taken into account⁸.

1.5 Consultation Arrangements

- 1.5.1 In accordance with the NPPF and PPG, this LAA was subject to consideration and scrutiny by the SEEAWP in November 2019. Other bodies invited to comment on its contents include the following:
- counties that receive or provide aggregates to West Sussex;
 - the Coast to Capital Local Economic Partnership;
 - the Crown Estate;
 - the Marine Management Organisation;
 - the Local Nature Partnership;
 - Natural England.

⁸ See Paragraph 172 of the NPPF.

2. Aggregates in West Sussex

2.1 Supply Options

- 2.1.1 When planning for a steady and adequate supply of minerals, MPAs have to consider all supply options. West Sussex currently supplies aggregates from a number of sources including:
- soft sand, sharp sand, and gravel extracted at quarries in West Sussex;
 - recycled and secondary aggregate production;
 - imported aggregate (e.g. crushed rock and sand and gravel) by road, rail, and sea; and
 - sand and gravel dredged from the seabed (marine-won)
- 2.1.2 Each supply option is considered separately below including the economic and environmental opportunities and constraints that might influence the situation. This information is then used to consider the total aggregate supply picture and the balance between supply and demand.

2.2 Geology and Landscape

- 2.2.1 In broad terms, the county has a sequence of broad geological bands which run across the County from the west to east; see 'Appendix A: LAA Map'.
- 2.2.2 Soft sand is won from the Sandgate Formation and the Folkestone Formation (also known as the Folkestone Beds) which is worked in a number of locations in West Sussex. The variable grain size and low clay content mean that little or no processing is required to produce high quality construction and mortar sands.
- 2.2.3 Coarser, sharp sand and gravels lie over the chalk to the north of a line approximating to the route of the A27 and have been exploited in dry workings. Overlying the clay to the south, cleaner, better-sorted gravels have been exploited through wet working as evidenced by lakes around the eastern and southern fringes of Chichester. Sand and gravel resources are clustered around Chichester and south of the SDNP from the Funtington area in the west to Slindon in the east. The sharp sand and gravel deposits are primarily used to make concrete, concrete products, or cement.
- 2.2.4 The SDNP covers almost half the Folkestone Formation in West Sussex, and part of the sharp sand and gravel resource north of Chichester. The Chichester Harbour Area of Outstanding Natural Beauty (AONB) designation includes a small area which contains potential sharp sand and gravel. The extent of these landscape designations is shown in 'Appendix A: LAA Map'.
- 2.2.5 There are no indigenous sources of crushed rock in West Sussex, therefore, this aggregate is imported into West Sussex by rail or sea.
- 2.2.6 Much of the soft sand outside the SDNP in West Sussex has been worked or is currently being worked. The majority of the remaining

land-won soft sand resources lie within the SDNP. Stakeholder engagement carried out in 2008/09 provided some information about the quality of sand and gravel resources outside the National Park. One operator advised that after some limited investigation (drilling boreholes, etc.) of unconsolidated sand deposits, anything east of Steyning was found to be finer and 'dirtier' deposits which may make extraction uneconomic on any significant scale. There has also been no significant interest in any areas outside of the SDNP, including through the 'call for sites' processes in 2014, and more recently, for the soft sand review, during 2018.

- 2.2.7 With regard to sharp sand gravel deposits, operators commented that it becomes much thinner to the south east and therefore uneconomic to work. At the western end, it was felt that any deposit south of the A27 would also be uneconomic.
- 2.2.8 Soft sand from the Sandgate Formation and the Folkestone Formation is worked in a number of locations in West Sussex. The variable grain size and low clay content mean that little or no processing is required to produce high quality building sands for plaster and mortar. Gravel of varying quality and some sharp sand is used for concrete products, which cannot be used as a building sand for mortar.

2.3 Land-won Sand and Gravel

- 2.3.1 Past sales figures for land-won sand and gravel provide an indication of the contribution that the land-won sources of supply have made to the total supply of aggregates in West Sussex.
- 2.3.2 Annual land-won sales data over the past 10 years is presented in Table 1 and Figure 1.
- This shows that sales had fallen from 408,000 tonnes in 2008 to as low as 238,577 tonnes (2014) during the 10-year period since 2007.
 - There was an increase in sales in 2016, up to 420,000 tonnes.
 - The average annual sales figure over the 10-year period for sand and gravel is 309,206 tonnes and the average for the past three years is higher (337,597 tonnes).
- 2.3.3 It is not possible to provide sales figures for individual mineral types but the average split between the two land-won aggregate types in West Sussex over the last 10 years is 93% soft sand and 7% sharp sand and gravel. This equates to 283,306 tonnes of soft sand and 28,128 tonnes for sharp sand and gravel (10-year annual averages).
- 2.3.4 As aggregates are used in the building of homes, it is worth considering housing completion data when considering trends in aggregate sales.
- Gross dwelling completions within West Sussex fell from 3,060 in 2008/09 to 2,400 in 2012/13 (a 22% reduction) and there was a 32% drop in land-won sand and gravel sales over the same period.
 - Housing completions have recovered since 2012/13 (2,400), up to as high as 4,784 completions in 2015/16, an increase of circa 50%. Land-won sand and gravel sales increased from 0.28mt in 2012, up to a high of 0.42mt in 2016, an increase of circa 32%.

- In 2018, housing completions are almost back at the levels seen in 2015 (up to 4,675). The data suggests a link between housing completions and aggregate sales, whereby as completions have risen and fallen in West Sussex, sales of land-won sand and gravel have also risen and fallen.

2.3.5 As sand and gravel is won from both land-won and marine-won sources, it is relevant to consider all sand and gravel sales in comparison to completions. Figure 1 shows that there is some correlation between aggregate sales and housing completions in West Sussex.

- Total sand and gravel sales (land-won and marine-won) were falling during 2008 and 2009, recovering in 2010 and 2011, which was also the case in housing completions.
- In later years (2014 to 2018) housing completions have steadily increased, as have sales of aggregates.
- There is not a perfect correlation, likely due to the fact that West Sussex exports significant amounts of both land-won sand and gravel extracted in West Sussex, and marine sand and gravel landed in West Sussex.

2.3.6 The general fall in land-won aggregate sales has been replicated in neighbouring authorities, with Hampshire and Surrey also showing a downward trend in sales up until 2012; however there have been increases since. See Table 2 and Figure 2.

- In the South East, the overall trend of sales is a year-on-year general decline in sales, so that by 2017 they were 46% less than in 2007⁹. Despite the increasing levels of economic growth recorded between 2004 and 2007, sales in the South East fell 18% during the same period. This indicates that the link between sales of aggregates and economic growth is not clear cut or straightforward. Sales have increased since 2015, and in 2017 a total of 6.18mt of land-won sand and gravel were sold, the highest since 2008, and 15% higher than the 10-year average of sales.
- With regard to East Sussex, due to the very small number of sand and gravel sites, there are zero returns for over half of the 10-year period and the rest of the figures are confidential; therefore no figures are reported.

⁹ SEEAWP (2017) South East Aggregates Monitoring Report 2017.

Table 1: Sales of land-won sand and gravel in West Sussex 2009-2018

Year	Sales (tonnes)
2009	287,000
2010	301,000
2011	284,000
2012	284,000
2013	276,692
2014	238,577
2015	244,594
2016	420,000
2017	348,196
2018	430,478
3-year average (2015-2017)	399,318
10-year average	311,433 (283,306 soft sand; 28,128 sharp sand and gravel¹⁰)

Note: Sales data is based on estimates using operator returns, supplemented, where necessary, by estimates based on past rates and information from site visits. The figures for soft sand and sharp sand and gravel have been amalgamated due to reasons of confidentiality.

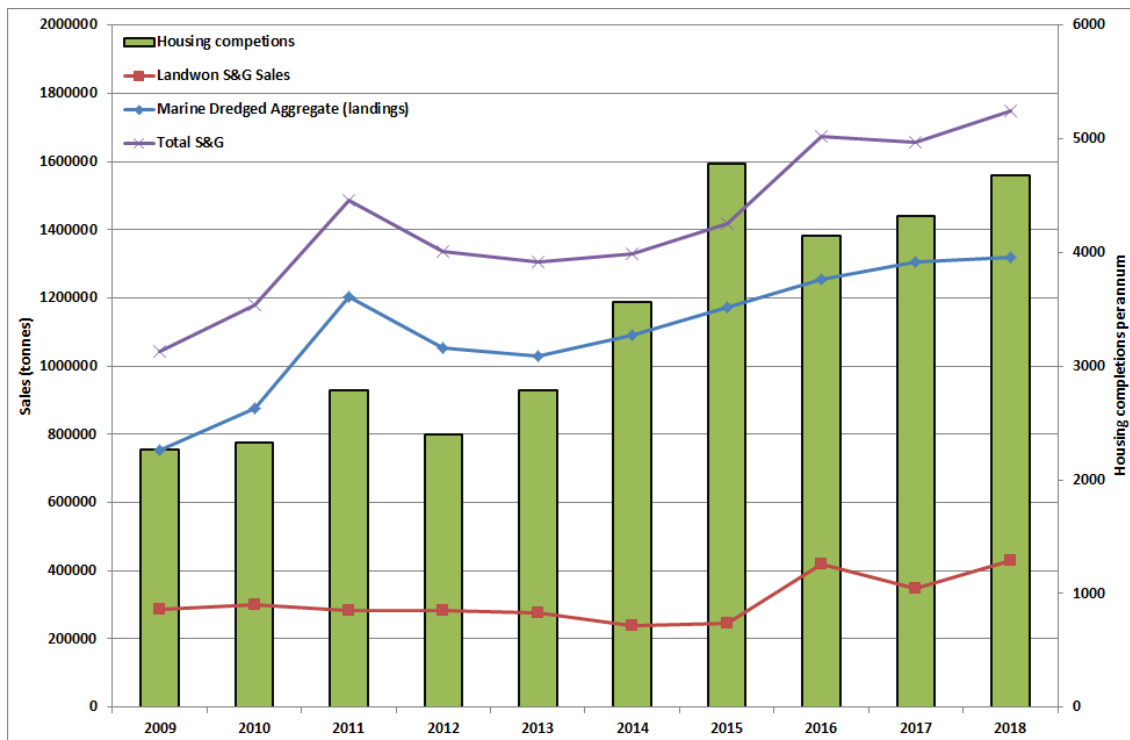


Figure 1: Sales of sand and gravel in West Sussex compared to housing completions 2009-2018

¹⁰ Figures may not add up to 93% and 7% exactly due to rounding.

Table 2: Sales of land-won sand and gravel in adjoining authorities 2009-2018

Year	Hampshire	Surrey
2009	1,050,000	850,000
2010	980,000	880,000
2011	830,000	660,000
2012	750,000	620,000
2013	850,000	790,000
2014	880,000	978,000
2015	830,000	740,000
2016	918,000	730,000
2017	963,000	799,000
2018	1,145,000	908,000
3-year average (2016-2018)	719,766	812,000
10-year average (2009-2018)	919,600	795,000

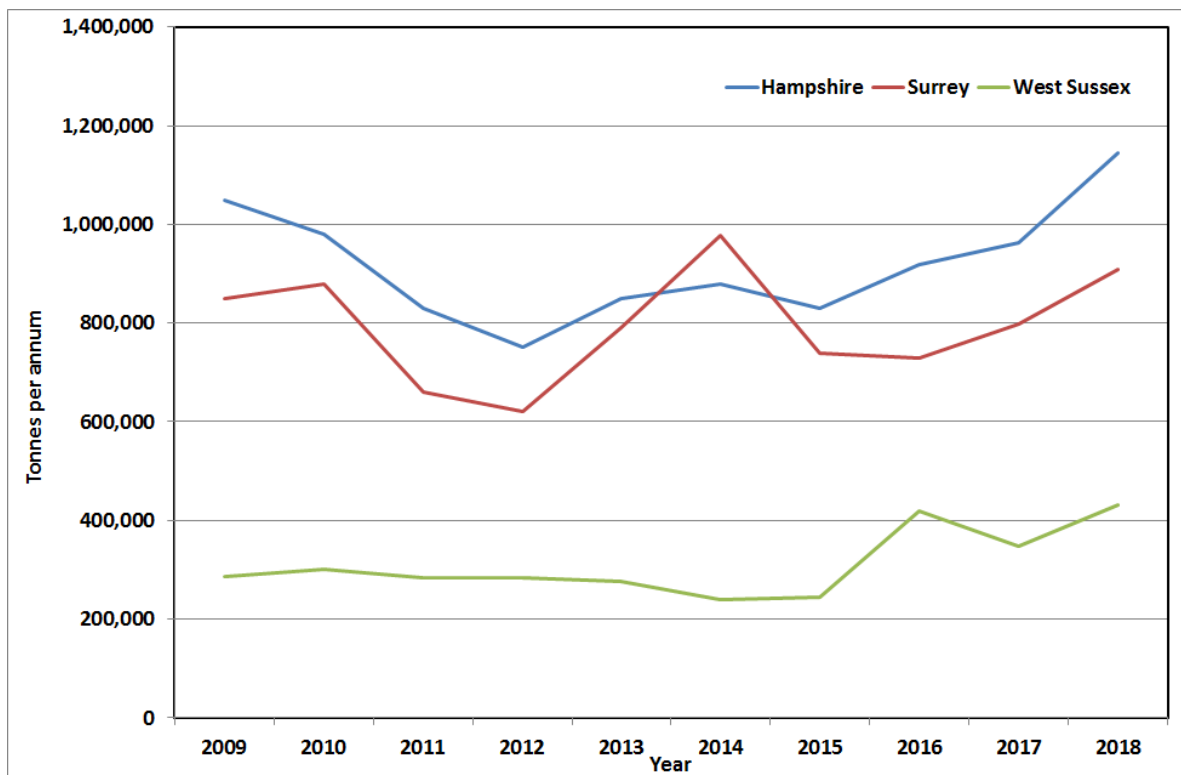


Figure 2: Sales of land-won sand and gravel in adjoining authorities 2009-2018

Other Relevant Information affecting Aggregate Supply and Demand

- 2.3.7 The Authorities have carried out an assessment of the likely demand for aggregates over the JMLP plan period based on anticipated levels of construction of homes and the maintenance and construction of roads. No other major infrastructure projects are anticipated in or near West Sussex that might influence the demand for aggregate. Scenarios were developed taking into account two growth factors (housing = 28.8%, construction of roads = 28.2%). 'Appendix B: Effect of Housing and Road Construction on Aggregate Supply and Demand' explains how these factors have been derived. This includes assumptions regarding the level of different aggregate supply related to these uses.
- 2.3.8 Sharp sand and gravel, soft sand, and crushed rock are considered separately as they are used for different purposes. This is consistent with paragraph 207 of the NPPF which states that "Minerals planning authorities should plan for a steady and adequate supply of aggregates by ... calculating and maintaining separate landbanks for any aggregate materials of a specific type or quality which have a distinct and separate market".
- 2.3.9 Further other relevant local information includes the fact that mineral resources, including soft sand, are constrained by the SDNP designation.

Sharp Sand and Gravel

- 2.3.10 Based on the 10-year average split of sales (93% soft sand and 7% sharp sand and gravel), the 10 years' annual sales data for sharp sand and gravel is 28,128 tonnes. The national PPG states that three-year average annual sales should also be factored into consideration of a sales trend. The three-year average annual sales figure for sharp sand and gravel in West Sussex is 83,758 tonnes. It must be noted that sales of sharp sand and gravel includes incidental sales from a soft sand site.
- 2.3.11 Existing reserves are provided by a single existing permission at Kingsham gravel site which has an estimated remaining yield of 795,000 tonnes.
- 2.3.12 Forecast demand scenarios have been established below based on the following assumptions using the data presented in 'Appendix B: Effect of Housing and Road Construction on Aggregate Supply and Demand'.
- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
 - Assumption 2: Spending on road maintenance/improvements is expected to increase by 28.2% in West Sussex.
 - Assumption 3: Up to 88% of sand and gravel may be used in homes.
 - Assumption 4: Up to 37% of sand and gravel may be used on road maintenance/improvements.
- 2.3.13 The annual demand values associated with each of these scenarios is set out in Table 3. The table also shows the extent of any predicted shortfall having regard to the existing reserves.

- 2.3.14 The calculated maximum average annual demand (demand forecast scenario 3) is 35,581 tonnes, which suggests that a total of 498,138 tonnes of land-won sharp sand and gravel would need to be supplied to 2033.
- The minimum calculated landbank for sharp sand and gravel, based on the current reserves against demand forecast scenario 3, is 23 years (calculated by dividing the reserve figure of 795,000 tonnes by the annual maximum demand figure of 35,581 tonnes).
 - **Therefore, using the 10-year average, there is no theoretical shortfall of land-won sharp sand and gravel reserves** in West Sussex over the remaining plan period to 2033.
- 2.3.15 However, national PPG (paragraph 064) states that, in addition to considering the 10-year average, MPAs should also consider average annual sales over the previous three years when identifying the general trend of demand.
- Using the three-year sales average of 83,758 tonnes per annum, the landbank for land-won sharp sand and gravel would be 9.5 years (that is, the reserve figure of 795,000 tonnes divided by 83,758 tonnes).
 - **Therefore, using a three-year average, the requirement would be 1,172,617 tonnes (three-year average x 14 years) resulting in a theoretical shortfall of 377,617 tonnes over the remaining plan period to 2033;** that is, the requirement of 1,172,617 tonnes less the reserve of 795,000 tonnes.
- 2.3.16 The adopted Joint Minerals Local Plan contains a criteria-based policy (Policy M1) that allows proposals for the extraction of sharp sand and gravel on unallocated sites to come forward where they are required to maintain a steady and adequate supply of land-won sharp sand and gravel and to maintain at least a seven-year landbank. In determining the need for such proposals, consideration will be given by the County Council to both the 10-year and three-year average calculations of demand.

Table 3: Sharp sand and gravel demand forecast scenarios 2019-2033 (tonnes)

Annual Demand Value	Demand Forecast Scenario 1	Demand Forecast Scenario 2	Demand Forecast Scenario 3
Assumptions applied	None (10-year average only)	1, 2, 3, and 4	1 and 2
10-year average	22,663	22,663	22,663
Additional demand for housing	n/a	5,744	6,527
Additional demand for roads	n/a	2,365	6,391
Total annual requirement	22,663	30,772	35,581
Total requirement over Plan period (2019-2033)	317,285	430,803	498,138
Current reserves	795,000	795,000	795,000
Shortfall (positive)/surplus (negative)	-477,715	-364,197	-296,862

Soft Sand

- 2.3.17 Based on the 10-year average split of sales (93% soft sand and 7% sharp sand and gravel), the 10 years annual sales data for soft sand is 288,718 tonnes. The three-year average for annual soft sand sales in West Sussex is 315,560 tonnes.
- 2.3.18 Existing reserves are provided by several sites (see Table 6) and currently amount to 2,300,437 tonnes.
- 2.3.19 Forecast demand scenarios for land-won soft sand have been established using the following key assumptions based on data presented in 'Appendix B: Effect of Housing and Road Construction on Aggregate Supply and Demand'.
- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
 - Assumption 2: Up to 88% of sand and gravel may be used in the construction of residential dwellings.
- 2.3.20 As road maintenance or improvement works do not involve the use of soft sand, these activities have been excluded from calculations of demand forecasts for soft sand. These demand forecasts build on the 10-year average of 288,718 tonnes, which are set out in Table 4.
- 2.3.21 The annual demand values associated with each of these scenarios is set out in Table 4. The table also shows the extent of any predicted shortfall having regard to the existing reserves.
- 2.3.22 Table 4 suggests that additional supplies of between 1.74mt and 2.91mt of soft sand are needed over the JMLP plan period (to 2033). The maximum landbank, based on the current reserves against the 10-year average, is eight years (calculated by dividing the reserve figure of 2,300,437 tonnes by the 10-year average of 288,718). The landbank based on the highest forecast annual demand (demand forecast option 3) is 6.2 years (2,300,437 divided by 371,869).
- 2.3.23 National PPG (paragraph 064) states that MPAs should also consider average annual sales over the previous three years, to identify the general trend of demand. Based on the three-year average of soft sand sales (315,560 tonnes), and current reserves, the landbank is currently 7.3 years. The requirement over the plan period would theoretically be 4,417,835 tonnes (three-year average x 14), and therefore the shortfall would be 2,117,398 tonnes.
- 2.3.24 At present, there are seven permitted soft sand sites in the Plan Area, as set out in Table 6. These sites have a total reserve of 2,300,437 tonnes.
- 2.3.25 In light of the estimated shortfalls in soft sand supplies it is considered appropriate to consider the possibility of permitting further reserves of soft sand if proposals come forward. The Soft Sand Review of the JMLP considers potential allocations for soft sand reserves, which has been submitted for examination on its soundness and legal and procedural compliance. Any future LAAs will replace this LAA as the latest position in terms of supply and demand of soft sand.

Table 4: Sharp sand and gravel demand scenarios 2019-2033 (tonnes)

Annual Demand Value	Demand Forecast Scenario 1	Demand Forecast Scenario 2	Demand Forecast Scenario 3
Assumptions applied	None (10-year average only)	1 and 2	1
10-year average	288,718	288,718	288,718
Additional demand for housing	n/a	73,173	83,151
Total annual requirement	288,718	361,891	371,869
Total requirement over Plan period (2019-2033)	4,042,059	5,066,478	5,206,172
Current reserves	2,300,437	2,300,437	2,300,437
Shortfall	1,741,622	2,766,041	2,905,735

Imports and Exports of Land-won Sand and Gravel

- 2.3.26 West Sussex imports and exports land-won aggregates from/to surrounding MPAs, as well as further afield, and it is important to understand the current and potential future issues affecting cross-boundary movements of land-won sand and gravel between West Sussex and other neighbouring and more distant mineral planning authorities.
- 2.3.27 A national four-yearly aggregate minerals survey is conducted by the Department of Communities and Local Government (CLG) and the British Geological Survey (BGS) which includes analysis of the movements (imports and exports) of aggregates for each MPA in England and Wales. A survey was not undertaken in 2013, and instead took place in 2014 – see [Aggregate Minerals Survey for England and Wales 2014](#). The data presented below comes from the latest national survey (2014) and from data obtained from the BGS. A further survey has not taken place; therefore the 2014 data is the best available in terms of understanding the movement of minerals.
- 2.3.28 Due to confidentiality restrictions, import and export data figures were provided by BGS as a percentage range of total supply to each MPA, to provide an indication of the relative importance of each supplying MPA. Table 5 shows that in 2014 up to 55,000 tonnes of sand and gravel were imported into West Sussex, whilst up to 275,600 tonnes of sand and gravel was exported from West Sussex. Therefore, for land-won sand and gravel, West Sussex is a net-exporter. Table 5 also shows that aggregate may be transported considerable distances to and from West Sussex.

Current Supply of Land-Won Sand and Gravel

- 2.3.29 Land-won sand and gravel is currently supplied from seven sites in West Sussex, six of which were operating before the designation of the South Downs National Park, which now forms part of the plan area and covers a substantial part of the sand and gravel mineral resource. These sites are presented in Table 6 and shown in Appendix A: LAA Map. The total permitted reserve of land-won sand and gravel in West Sussex was 3,095,437 tonnes.

Table 5: Origin/destination of land-won sand and gravel imported/exported to/from West Sussex, 2014

Origin/Destination	Imports to West Sussex (tonnes)	Exports from West Sussex (tonnes)
Berkshire	Up to 1,000	Up to 12,000
Buckinghamshire and Milton Keynes	0	7,900-79,000
East Sussex and Brighton & Hove	0	2,600-29,000
Hampshire and Isle of Wight	1,000-10,000	Up to 17,600
Oxfordshire	Up to 1,000	0
Kent and Medway	Up to 1,000	0
Surrey	10,000-20,000	7,600-84,000
South East Region Sub-total	11,000-33,000	18,100-221,600
Cambridgeshire	Up to 1,000	0
Dorset	Up to 1,000	0
Essex	30,000-40,000	0
Wilshire and Swindon	0	Up to 5,400
Unknown, in the South West	Unknown	24,300-48,600
Outside South East Region Sub-Total	30,000-42,000	24,300-54,000
Overall Total Imports/Exports (excluding West Sussex consumption)¹¹	41,000-55,000	42,400-275,600

Source: Data obtained from the British Geological Survey and was based on the 2014 Aggregate Minerals Survey.

Note: Ranges are provided due to confidentiality restrictions.

¹¹ There is also some (between 15,400 and 154,000 tonnes) of land-won sand and gravel that was consumed in the South East, however the final destination for its consumption is recorded as "unknown". It is presumed that some of this would have been consumed in West Sussex, whilst some consumed in other areas around the South East.

Table 6: Permitted sand and gravel quarries in West Sussex (2019)

Soft Sand

Location	Site	Operator	Status
SDNP	West Heath Quarry, West Harting, Petersfield	CEMEX UK Operations	Active – Sand extraction
SDNP	Heath End Quarry, Station Road, Heath End, Petworth ¹²	Dudman Group Ltd.	Active – Sand extraction.
SDNP	Minsted Sandpit, Minsted Lane, Stedham	Dudman Group Ltd.	Inactive
West Sussex	Rock Common Sandpit, Washington, Pulborough	Dudman Group Ltd.	Active – Sand extraction.
West Sussex	Sandgate Park Quarry, Water Lane, Sullington, Storrington	CEMEX UK Operations	Active – Sand extraction.
West Sussex	Washington Sand Pit, Hampers Lane, Sullington	Britaniacrest Recycling Ltd.	Active – Sand extraction.
West Sussex	Chantry Sand Pit, Chantry Lane, Storrington	Dudman Group Ltd.	Inactive

Sharp Sand and Gravel

Location	Site	Operator	Status
West Sussex	Land at Kingsham, South of Chichester, Chichester	Dudman Group Ltd.	Active – Sand and gravel extraction.

Note: In accordance with the PPG, mineral sites that are subject to a stalled review of their planning conditions have not been included in the assessment of existing reserves.

¹² Continued extraction permitted on appeal – 6 September 2016.

Potential Constraints to Future Land-won Supply

- 2.3.30 West Sussex has a number of environmental and landscape designations, including the South Downs National Park (SDNP) which is afforded the highest level of protection by national policy. These designations can restrict, and may continue to restrict, opportunities for future minerals development, particularly in regard to land-won extraction. Consideration of future supply from within the SDNP will be considered through the soft sand review of the JMLP.
- 2.3.31 In accordance with the national PPG, it is important that the effects of environmental constraints are taken into account, as 'other relevant local information', when considering options for meeting aggregate demand through the Plan period. This is especially pertinent to consideration of the future supply of soft sand as the majority of the resource in West Sussex is located within the SDNP.
- 2.3.32 Floodplains, Source Protection Zones (SPZs), secondary and principal aquifers, groundwater depth, geology, and smaller abstractions are also constraints that need to be taken into consideration when identifying suitable sites for mineral extraction.
- 2.3.33 Minerals development should not have a significant impact on communities if they are designed, managed, and located appropriately. However, concerns may still be raised about the potential impacts of noise and dust, as well as associated lorry movements, particularly at the planning application stage. Such issues need to be addressed to ensure that minerals development does not significantly impact the amenity of local communities.
- 2.3.34 Soft sand has specific applications for which concreting and other aggregate materials are unsuitable and is most commonly used in mortar. The South Downs Soft Sand Study (2012) states that the Crown Estate "believe that there is potential for marine sources to provide viable 'soft' sand as an alternative to land-based quarrying". There are sources of marine-won aggregate being used, as a replacement, or through blending, to create mortar.
- In 2014, in England and Wales, 1.05mt of marine-won aggregate was used in mortar. Of this, 72,000 tonnes were sold in the South East.
 - The SEEAWP South-East England Aggregates Monitoring Report 2017 sets out that some 50,710 tonnes of marine soft sand was sold from South East wharves (Table 8).
 - Evidence collated via the annual Aggregate Monitoring Surveys shows that during the three-year period 2016-2018, an annual average of around 39,773 tonnes of aggregate sold from West Sussex wharves was sold as soft sand. Not all of this was recorded as marine-won however, with the three-year average of marine-won soft sands being 23,278 tonnes per annum, and remainder being land-won sands.
 - Historically the aggregate available on the South Coast have not been considered to be suitable for soft sand. The West Sussex Joint

Minerals Local Plan safeguards sufficient wharf capacity in West Sussex (see Table 21 in the JMLP).

Land-Won Sand and Gravel Summary

Past to current demand:

- Sales of land-won sand and gravel have generally fallen during the last 15 years, from a high of 784,000 tonnes in 2004 to as low as 238,577 tonnes in 2014. Sales had fluctuated, with 420,000 tonnes sold in 2016, but only 348,196 tonnes sold in 2017, and an increase in 2018, up to 430,478 tonnes.
- Average sales of land-won sand and gravel over the last 10 years is **311,454 tonnes**.
- Average sales of soft sand over the last 10 years is **288,718 tonnes**.
- Average sales of sharp sand and gravel over the last 10 years are **22,663 tonnes**.

Other relevant local information:

- For sharp sand and gravel, based on the calculated maximum annual demand (demand forecast scenario 3), there are sufficient levels of permitted reserves to 2033.
- For soft sand, when applying a rolling 10-year average and other relevant local information, an additional **1.74mt to 2.91mt** are needed over the Plan period (to 2033). For soft sand, when applying the three-year average, shortfalls would be lower, at an additional 2.12mt being required over the plan period.

Imports and exports (of land-won and marine-won sand and gravel):

- In 2014 up to 0.23mt of sand and gravel was imported into West Sussex.
- In 2014, up to 1.82mt of sand and gravel was exported from West Sussex.
- As such, West Sussex is a **net exporter** of sand and gravel.

Supply:

- In 2018, the total permitted reserve of land-won sand and gravel was 3,095,437 tonnes.
- There are no allocations for sharp sand and gravel in the Joint Minerals Local Plan (2018).
- The soft sand review of the Joint Minerals Local Plan is being progressed, and the authorities are proposing the allocation of three sites, with a combined yield of circa 2.68mt.

2.4 Marine-Won Sand and Gravel

- 2.4.1 A steady and significant supply of marine-won sand and gravel is landed at wharves in West Sussex. This is a major source of primary aggregate and also a principal alternative source to land-won aggregate. Marine-won sand and gravel landed in the South East of England is primarily used as a replacement for sharp sand and gravel, and is not considered a viable substitute for soft/building sand at this time.
- 2.4.2 The Joint Minerals Local Plan (2018) safeguards wharves from development which may prevent or prejudice their operation, and to ensure that a steady and adequate supply of minerals can be maintained.
- 2.4.3 Although marine-won aggregates were landed at Littlehampton in the past, this activity ceased in 2004 when the aggregate processing plant was removed. The full potential of Railway Wharf, Littlehampton would only be realised if the operator re-established a marine aggregate processing plant, and if navigation/silting problems on the River Arun were resolved to allow continued access for small dredgers. The wharf at Littlehampton is currently used to import crushed rock by sea, for use in the adjacent Coated Roadstone Plant. This leaves Shoreham as the only port used for landing marine-won sand and gravel in the County.
- 2.4.4 National marine policy is contained within the Marine Policy Statement (MPS) which sets out a framework for preparing marine plans and taking decisions affecting the marine environment. The South Marine Plan (SMP) was adopted in July 2018 and covers an area which is the second busiest in England for marine aggregate extraction, with a total area that is licensed for aggregate extraction of 155.47km². The SMP contains policies to ensure that aggregate extraction licensed areas are protected for that use, whilst those areas with high aggregate potential are also protected.
- 2.4.5 Mineral rights for marine-won sand and gravel are owned by the Crown Estate, who issue licences for dredging activity. Marine-won sand and gravel landed in West Sussex is dredged from the channel in the 'South Coast' region which is the largest dredging region in terms of permitted tonnages. There are currently 15 production licences allowing the extraction of 8.63 million tonnes per year, and an estimate of 29 years of production permitted.

Use of Marine-Won Aggregate

- 2.4.6 Marine-won aggregates from the SMP areas are predominantly of a similar nature of sharp sand and gravel. They are used for producing concrete, transport infrastructure, replenishing beaches, and improving coastal defences, as well as being exported to neighbouring European countries¹³. As marine- and land-won aggregates are geologically similar, they can be easily substituted for one another in many uses.
- 2.4.7 A publication on marine sands in mortars and screeds from the British Marine Aggregate Producers Association (BMAPA) states that the main difference between the majority of land-based sands and marine sands

¹³ Crown Estate (2018). Marine Aggregates Extraction 2017 – 20th Annual Report

are the presence of chloride and shell. The publication states that there is occasionally resistance by specifiers and purchasers to resist the use of marine-won sands due to their potential to include low levels of chlorides but concludes that marine sands show no aesthetic problems associated with sand source¹⁴.

- 2.4.8 The Marine Sand and Gravel Resources map produced by BGS and the Crown Estate shows the current and potential marine sand and gravel resources, as well as current licensed areas; see [Offshore Mineral Resource Maps](#) on BGS' website. This indicates that there are some areas of 'fine sand' within the South Marine Plan onshore and offshore areas, but that the currently licensed areas are in areas of coarse sand and coarse aggregate. The accompanying report states that the map delineates areas within which potentially workable minerals may occur but that this takes no account of planning constraints that may limit their working and that the economic potential of individual sites can only be proved by a detailed evaluation programme¹⁵.
- 2.4.9 Research undertaken provided the Authorities anecdotal evidence that suggests mortar manufacturers in the south east may be using marine-won sand in their mortar products in place of land-won soft sand. The use of marine-won sand in mortar is commonplace in other parts of England, however there is no detailed evidence of this taking place in the south east.

Pattern of Previous Landings and Sales and Current Demand for Marine-won Aggregate

- 2.4.10 Landings of marine-won aggregate at wharves in West Sussex have increased steadily over the last 10 years with a particularly marked increase observed since 2010 (Table 7).
- 2.4.11 Landings of marine-won aggregate at wharves in West Sussex make a significant contribution to overall aggregate supplies in West Sussex and neighbouring authorities (particularly East Sussex and Brighton & Hove).

¹⁴ British Marine Aggregate Producers Association

¹⁵ British Geological Survey (2013) The Mineral Resources of the English Channel and Thames Estuary

Table 7: Landings and sales of marine-won sand and gravel at West Sussex wharves 2009-2018

Year	Landings of marine-won sand and gravel (tonnes)	Sales of marine-won sand and gravel from wharves (tonnes)
2009	755,018	872,267
2010	877,799	899,944
2011	1,203,574	1,213,356
2012	1,052,976	1,470,023
2013	1,029,108	1,616,136
2014	1,090,138	1,626,551
2015	1,173,304	1,639,146
2016	1,254,255	1,809,675
2017	1,307,447	1,340,189
2018	1,318,508	1,347,922
3-year average	1,293,403	1,499,262
10-year average	1,106,153	1,383,521

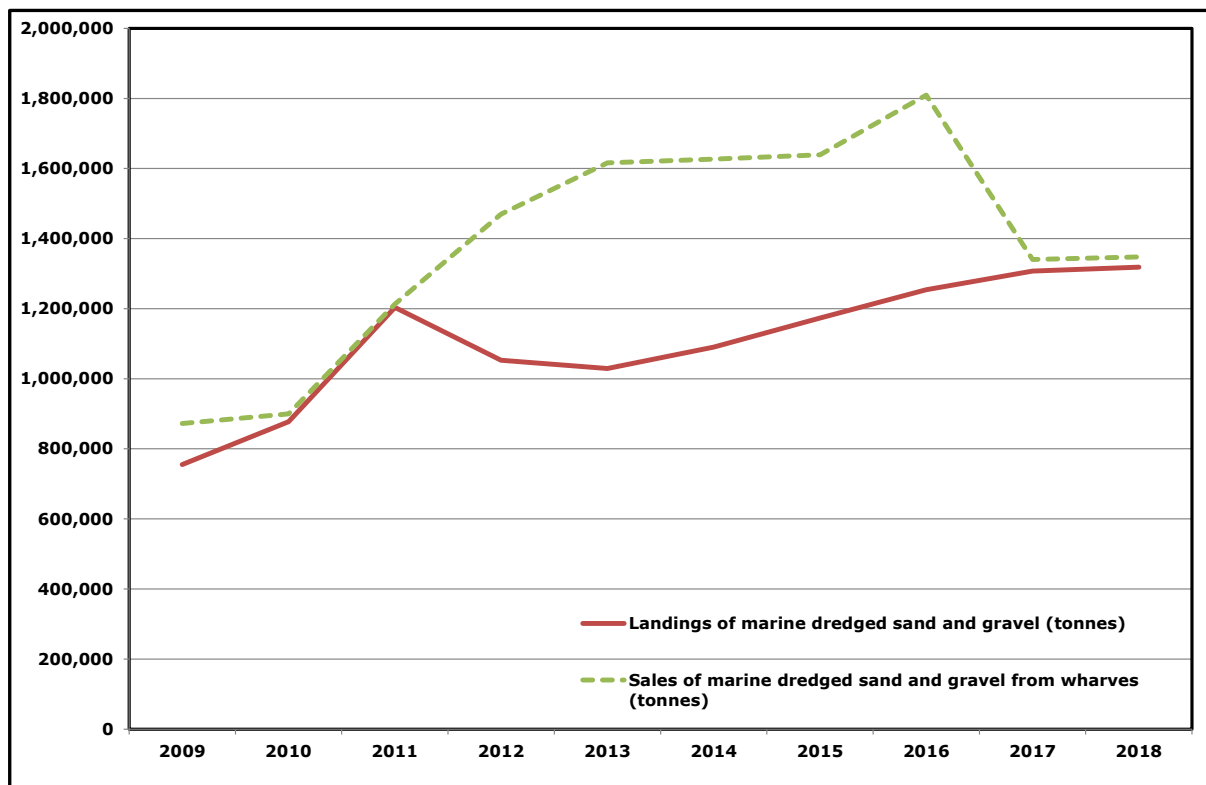


Figure 3: Landings and sales of marine-won sand and gravel at West Sussex wharves 2009-2018

Future Demand for Marine-Won Sand and Gravel

- 2.4.12 Forecasts of future demand for marine-won aggregate are based on landings data (provided by the Crown Estate) as this removes the element of double counting, whereby some operators of wharves are buying aggregate from other wharf operators and reporting their sales. Landings data therefore provides a more accurate picture of future demand.
- 2.4.13 Different scenarios on future demand have been derived based on different mixes of the following assumptions.
- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
 - Assumption 2: Spending on road maintenance/improvements is expected to increase by 28.2% in West Sussex.
 - Assumption 3: Up to 88% of sand and gravel may be used in homes.
 - Assumption 4: Up to 37% of sand and gravel may be used on road maintenance/improvements.

Other Relevant Local Information

- 2.4.14 A large amount of marine-won sand and gravel is exported to Brighton & Hove and East Sussex, where housing growth is predicted to grow by an estimated 61.75%. However, for the purposes of forecasting demand, the projected growth of housing figure for West Sussex (26.8%) has been used because it is considered more relevant, particularly when compared to other neighbouring areas, where the average is less than 30%, but the actual number of homes is considerably higher. These forecasts build on the 10-year average of annual landings (1,003,747 tonnes) and are set out in Table 8.
- 2.4.15 The demand forecast based on landings data shows that demand could be as high as 1,736,660 tonnes per annum. If this is compared to the estimated capacity at wharves in West Sussex, there would significant additional capacity available. The wharves do however also import crushed rock; therefore, total annual capacity requirements for wharves are discussed later in this report.

Table 8: Demand forecast scenarios for marine-won sand and gravel based on landings 2019–2033 (tonnes per annum)

Annual Demand Value	Demand Forecast: Scenario 1(B)	Demand Forecast: Scenario 2(B)	Demand Forecast: Scenario 3(B)
Assumptions applied	None (10-year average only)	1, 2, 3, and 4	1 and 2
10-year average	1,106,153	1,106,153	1,106,153
Additional demand for housing	n/a	280,343	318,572
Additional demand for roads	n/a	115,416	311,935
Total annual requirement	1,106,153	1,501,912	1,736,660

Imports and Exports

- 2.4.16 The East Sussex and Brighton & Hove LAA (2018) states that some 60% of the total marine sand and gravel consumed in East Sussex and Brighton & Hove in 2011 was supplied from wharves at Shoreham Harbour in West Sussex which means development in these areas is heavily dependent on landings of marine-won sand and gravel at these wharves. Imports and exports of marine-won sand and gravel also occur between West Sussex and Hampshire.

Current Supply of Marine-Won Sand and Gravel

- 2.4.17 The mineral wharves in West Sussex are primarily used for landing marine-won sand and gravel; however, they also land a modest proportion of crushed rock. The number of wharves within Shoreham Harbour has reduced in number in recent years. The JMLP safeguards a number of wharves, including one for its potential capacity. Capacity of West Sussex wharves is 2,070,000tpa, a reduction in capacity following the closure of one wharf which relocated from the Western Harbour Arm in Shoreham to the Eastern Harbour Arm (to Britannia Wharf), which falls within the Brighton & Hove authority area.

Marine-Won Sand and Gravel Summary

- The South Marine Plan areas are the busiest in England for marine aggregate extraction.
- 8.63mt of material is permitted for extraction per annum from licences within the 'South Coast Region'.

Pattern of previous landings and sales and current demand for marine-won aggregate:

- Landings and sales on marine-won sand and gravel in West Sussex have increased steadily over the last 10 years with a marked increase since 2011.
- The 10-year average of annual marine-won sales is 1,383,521 tonnes and 1,106,153 tonnes of landings.
- For the purposes of assessing demand, landings data has been used because this eliminates an element of double counting that has been identified.

Other relevant local information:

- The demand forecast based on landings data shows that demand could be as high as 1,736,660 tonnes per annum.

Imports and exports:

- Marine-won aggregates make a significant contribution to aggregate supply in West Sussex and neighbouring authorities (particularly East Sussex and Brighton & Hove) due to declining supplies from land-won sources in the area.

Wharf capacity:

- The capacity at wharves in West Sussex has fallen from 2,274,000 tonnes per annum down to 2,070,000 tonnes per annum

since the adoption of the JMLP. This is following the closure of one wharf, which has relocated to another part of Shoreham Harbour (in Brighton & Hove).

- Based on maximum landings of marine-won sand and gravel from West Sussex wharves between 2009 and 2018 (1,318,508 tonnes), there would be a theoretical minimum surplus capacity of 751,492 tonnes.
- Marine-won landings ceased in Littlehampton in 2005, although crushed rock landed at the wharf continues to serve the adjacent coated roadstone plant.

2.5 Sand and Gravel Imported by Rail

- 2.5.1 A relatively small amount of sand and gravel is imported into West Sussex by rail which could be either from marine-won or land-won sources (sharp sand and gravel, or soft sand). Evidence from stakeholder engagement in 2008/09 showed that most of the sand and gravel that came into one of the Crawley depots was bagged for builders' merchants or collected from the depot by building contractors. The vast majority of materials are delivered to fairly local destinations within a 20-mile radius due to the haulage costs.

Pattern of Previous Sales and Current Demand for Sand and Gravel Imported by Rail

- 2.5.2 Table 11 and Figure 4 show that sales of sand and gravel from railheads within West Sussex have fluctuated over the last 10-year period, peaking at 225,303 tonnes in 2009 and generally declining thereafter. There has been a steady increase since 2014, from 41,521 tonnes to 83,947 in 2017. The 10-year average annual sales of sand and gravel from railheads is 116,922 tonnes and the three-year average is 89,529 tonnes.

Table 9: Imports of sand and gravel to West Sussex railheads 2009-2018

Year	Sales of sand and gravel from railheads (tonnes)
2009	225,303
2010	195,599
2011	88,845
2012	140,466
2013	146,585
2014	41,521 ¹⁶
2015	63,019
2016	76,961
2017	83,947
2018	107,678
3-year average	89,529
10-year average	116,922

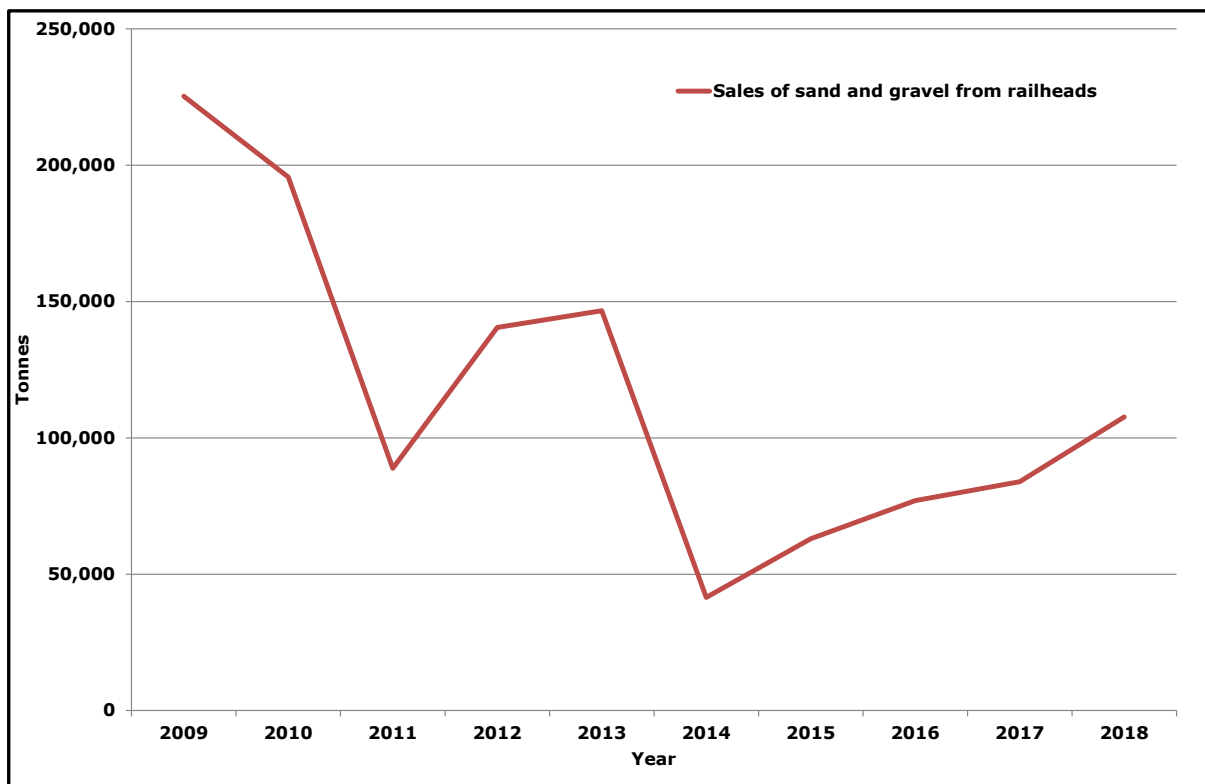


Figure 4: Imports of sand and gravel to West Sussex Railheads 2009-2018 (tonnes)

¹⁶ The fall in imports of sand and gravel in 2014 can be attributed to the fact that one railhead became inactive during 2014 and therefore reported nil returns. The imports to Chichester rail sidings were also previously reported as being sand and gravel but information provided the operator shows imports of both sand and gravel and crushed rock.

Future Demand for Sand and Gravel Imported by Rail

- 2.5.3 Two demand forecasts have been created taking account of the 10-year average of sales (116,992) and other relevant local information set out in the following assumptions.
- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
 - Assumption 2: Spending on road maintenance/improvements is expected to increase by 28.2% in West Sussex.
 - Assumption 3: Up to 88% of sand and gravel may be used in homes.
 - Assumption 4: Up to 37% of sand and gravel may be used on road maintenance/improvements.
- 2.5.4 The demand forecast scenarios are set out in Table 10.
- 2.5.5 Table 10 indicates that future demand for sand and gravel being imported by rail to West Sussex railheads may be as high at 183,678 tonnes per annum.

Table 10: Demand forecast scenarios for rail-imported sand and gravel 2019–2033 (tonnes per annum)

Annual Demand Value	Demand Forecast Scenario 1	Demand Forecast Scenario 2	Demand Forecast Scenario 3
Assumptions applied	None (10-year average only)	1, 2, 3, and 4	1 and 2
10-year average	116,992	116,992	116,992
Additional demand for housing	n/a	29,651	33,694
Additional demand for roads	n/a	12,207	32,992
Total annual requirement	116,992	158,850	183,678

Current Supply of Rail-Imported Sand and Gravel

- 2.5.6 There are five operational railheads in West Sussex, one in Chichester, one in Ardingly, and three in Crawley, all of which are safeguarded in the Joint Mineral Local Plan (2018).
- 2.5.7 The West Sussex Wharves and Railheads Study (2014) states that a total maximum capacity of 1,380,000 tonnes¹⁷. All but one of the railheads could probably improve throughput if more train pathways were available. The Rail Freight Strategy¹⁸ predicts long-term growth potential in bulk aggregate movements, reflecting new building developments (e.g. housebuilding), and large infrastructure projects (e.g. High Speed 2, road building, Crossrail 2, and new nuclear power stations). The strategy identifies that the constraint to rail freight movement will include the availability of rail freight terminals for handling bulk materials, in appropriate locations, highlighting the importance of protecting rail terminals.

Rail-Imported Sand and Gravel Summary

Pattern of previous and current demand for rail-imported sand and gravel:

- A relatively small amount (107,678 tonnes) of sand and gravel was imported into West Sussex by rail in 2018. Rail imports peaked at 225,303 tonnes in 2009.
- The 10-year average sales of sand and gravel from railheads is 116,992 tonnes.

Future demand:

- The likely demand for sand and gravel being imported by rail to West Sussex railheads to 2033 may be as high as 183,678 tonnes per annum.

Railhead capacity:

- West Sussex has five railheads with a potential total capacity of 1,380,000 tonnes.
- There is a sufficient capacity to allow for an increase in rail imports of sand and gravel, however this is addressed further in this report as crushed rock is also imported by rail.

2.6 Crushed Rock

- 2.6.1 Crushed rock is generally used for roadstone and rail ballast. West Sussex does not have any natural hard rock resources and relies on rail and sea imports of hard rock, such as limestone and granite, in order to meet local demand for this material.
- 2.6.2 There are three sites within West Sussex where crushed rock is used to make coated roadstone. These are strategically located close to rail and

¹⁷ Based on Scenario R1 in the West Sussex Wharves and Railheads Study (2014) which safeguards all five railheads.

¹⁸ Department for Transport (2016) Rail Freight Strategy: Moving Britain Ahead.

wharf infrastructure: Ardingly Rail Depot, EWS Goods Yard in Crawley, and Littlehampton Wharf, Littlehampton.

Pattern of Previous and Current Demand for Crushed Rock

- 2.6.3 Sales of crushed rock from wharves have been more variable over the 10-year period than those from railheads (Table 11) with a sudden drop experienced in 2013. The 10-year average annual sales of crushed rock from wharves is 98,532 tonnes.
- 2.6.4 Crushed rock sales from railheads have been steadily increasing since 2009 (Table 11 and Figure 5). The 10-year average sales of crushed rock from railheads is 533,528 tonnes but the three-year annual sales are substantially greater at 683,069 tonnes.

Table 11: Sales of crushed rock at West Sussex wharves and railheads 2009-2018

Year	Sales of Crushed Rock Aggregate from Wharves (tonnes)	Sales of Crushed Rock from Railheads (tonnes)	Total
2009	151,556	304,481	456,037
2010	138,927	573,222	712,149
2011	120,428	674,140	794,568
2012	123,457	702,396	825,853
2013	63,000	814,401	877,401
2014	76,670	684,271	760,941
2015	66,422	550,536	616,958
2016	61,747	555,539	617,286
2017	164,017	567,584	731,601
2018	89,986	674,770	764,756
3-year average	105,250	599,298	704,548
10-year average	105,621	610,134	715,755



Figure 5: Sales of crushed rock at West Sussex wharves and railheads 2009-2018 (tonnes)

Future Demand for Crushed Rock Imports from Wharves

2.6.5 Four demand forecast scenarios have been created which take account of the 10-year average of sales (105,621), and other relevant local information.

- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
- Assumption 2: Spending on road maintenance/improvements is expected to increase by 28.2% in West Sussex.
- Assumption 3: Up to 36% of crushed rock may be used in homes.
- Assumption 4: Up to 81% of crushed rock may be used on road maintenance/improvements.
- Assumption 5: Spending on road construction/maintenance in Brighton & Hove and East Sussex is projected to increase by 51.7% (applied to 1% of total sales to account for exports in previous years).

2.6.6 The calculations of demand are set out in Table 12, which shows that the likely demand for crushed rock being landed at West Sussex wharves may be as high as 166,371 tonnes per annum. The capacity of wharves in West Sussex is 2,070,000 tonnes per annum, therefore there is sufficient capacity to accommodate further demand for imports, however this is addressed further in this report wharves are also used for landing marine-won sand and gravel.

Future Demand for Crushed Rock Imports to Railheads

2.6.7 Two demand forecasts have been created for rail imports of crushed rock, taking account of the 10-year average of sales (610,134 tonnes) and other relevant local information set out in the following assumptions.

- Assumption 1: Housing is projected to grow by 28.8% in West Sussex.
- Assumption 2: Spending on road maintenance/improvements is expected to increase by 28.2% in West Sussex.
- Assumption 3: Up to 36% of crushed rock may be used in homes.
- Assumption 4: Up to 81% of crushed rock may be used on road maintenance/improvements.

2.6.8 Table 13 shows the calculations of demand and indicates that the likely demand for crushed rock import to West Sussex railheads may be as high as 957,910 tonnes per annum. The capacity of railheads in West Sussex is 1,380,000 tonnes per annum. As railheads are used to import both crushed rock and sand and gravel, total capacity is discussed later in this report.

Table 12: Demand forecast scenarios for marine-landed crushed rock 2019-2033 (tonnes per annum)

Annual Demand Value	Demand Forecast Scenario 1	Demand Forecast Scenario 2	Demand Forecast Scenario 3	Demand Forecast Scenario 4	Demand Forecast Scenario 5
Assumptions applied	None (10-year average only)	1-4	1 and 2	1-5	1, 2, and 5
10-year average	105,621	105,621	105,621	105,621	105,621
Additional demand for housing	n/a	10,951	30,419	10,951	30,419
Additional demand for roads	n/a	24,126	29,785	24,672	30,331
Total annual requirement	105,621	140,698	165,825	141,244	166,371

Table 13: Demand forecasts for rail-imported crushed rock 2019-2033

Annual Demand Value	Demand Forecast Scenario 1	Demand Forecast Scenario 2	Demand Forecast Scenario 3
Assumptions applied	None (10-year average only)	1, 2, 3, and 4	1 and 2
10-year average	610,134	610,134	610,134
Additional demand for housing	n/a	63,259	175,719
Additional demand for roads	n/a	139,367	172,058
Total annual requirement	610,134	812,760	957,910

Imports and Exports of Crushed Rock

- 2.6.9 The sources of crushed rock being imported into West Sussex are set out in Table 14, and are based on Aggregate Minerals Survey (2014) data provided by BGS. This is in the form of percentage ranges, due to confidentiality restrictions. The data shows that that Somerset (70-80%) is the main source of crushed rock being imported into West Sussex. Crushed rock is imported by sea to Littlehampton Port to service the adjacent coated roadstone plant. Total imports of crushed rock into West Sussex steadily rose between 2007 and 2013, after which there has been a decline from 877,401 tonnes, down to 617,286 tonnes in 2016. Sales in 2017 increased to 731,601 tonnes, and again increased, to 764,756 tonnes in 2018.

Table 14: Origin/destination of crushed rock landed in West Sussex (2014)

Origin/Destination	Imports to West Sussex (tonnes)
Outside England and Wales	76,100 to 152,200 (10-20%)
Cornwall Council	7,610 to 76,100 (1-10%)
Devon County Council	Up to 7,610 (<1%)
Dorset County Council	Up to 7,610 (<1%)
Gloucestershire County Council	Up to 7,610 (<1%)
North Somerset Council	Up to 7,610 (<1%)
Somerset County Council	532,700 to 608,800 (15-20%)
South Gloucestershire Council	Up to 7,610 (<1%)
Leicestershire County Council	7,610 to 76,100 (1-10%)
Shropshire Council	Up to 7,610 (<1%)
Northumberland National Park	Up to 7,610 (<1%)
Powys	Up to 7,610 (<1%)
Total	761,000

Current Supply of Crushed Rock

- 2.6.10 As set out earlier the wharves have a potential capacity to land 2,070,000 tonnes of aggregate imports. With regard to railheads, the West Sussex Wharves and Railheads Study (2014) states that they could have a total maximum capacity of 1,380,000 tonnes. As railheads are also used for importing sand and gravel, the total capacity requirements are considered later in this document.

Crushed Rock Summary

Pattern of previous and current demand for crushed rock:

- The vast majority of crushed rock used in West Sussex is imported via railheads, with some imports via wharves.
- Sales of crushed rock from railheads have steadily increased, from as little as 104,899 tonnes in 2004, up to a peak of 814,401 tonnes in 2013, after which there was a steady decline in sales (to 550,536 tonnes) up until 2015. Sales have increased since, with

sales of 674,770 tonnes in 2018. The 10-year annual sales average is currently 610,134 tonnes and the three-year average is 599,298 tonnes.

- Sales of crushed rock from wharves in West Sussex were steady between 2008 and 2012, after which they have fallen to between 61,000 and 76,000 tonnes, until 2017, when sales increased to 164,017 tonnes. Sales fell to 989,986 tonnes in 2018. The 10-year annual sales average is currently 105,621 tonnes and the three-year average is 105,250 tonnes.

Future demand:

- Demand for crushed rock being landed at West Sussex wharves may be as high at 166,371 tonnes per annum.
- Demand for crushed rock being imported by rail to West Sussex railheads may be as high at 957,910 tonnes per annum.

Capacity for importing crushed rock:

- West Sussex railheads have a potential capacity of 1,380,000 tonnes, indicating that there is sufficient capacity to meet future demand for imports of crushed rock.
- West Sussex wharves also have capacity to land future demand for imports of crushed rock.

2.7 Secondary/Recycled Aggregates

- 2.7.1 Aggregates sourced from waste materials can be used to substitute primary aggregates in a range of applications such as base layers for new developments and road construction. Higher quality recycled aggregates can also be used in the production of concrete for use in non-load bearing applications. Secondary and recycled aggregates can therefore reduce the demand for primary aggregates and so this LAA provides an assessment of the contribution that these materials may make to the overall supply of aggregates in the area.
- 2.7.2 Sources of secondary and recycled aggregates are provided below.

Secondary Aggregates

These come from by-products of industrial or mineral extraction processes and may be used either in raw condition or require processing. Secondary aggregates can be further sub-divided into manufactured and natural, depending on their source. Examples of manufactured secondary aggregates from industrial by-products are Incinerator Bottom Ash (IBA) which can be crushed to produce aggregate. Naturally occurring secondary aggregates generally come from mineral extraction and include china clay sand and slate aggregate. (Source: [WRAP](#).)

Recycled Aggregates

These usually comprise material derived from construction and demolition wastes, such as builders' rubble, bricks and tiles, and excavation waste (such as stone and rock). These materials generally

require processing (crushing and screening) but also include material recovered from surface dressing of highways (road planings).

- 2.7.3 While these materials come from distinct and discrete sources they are generally counted together being from non-primary sources.

Pattern of Previous and Current Demand for Recycled and Secondary Aggregate

Recycled Aggregate

- 2.7.4 The recorded sales figures between 2008 and 2018 for recycled aggregates in West Sussex are set out in Table 15. This shows that sales of recycled aggregates have been relatively stable with a peak in 2010 (630,000 tonnes) and an apparent decline since.

Table 15: Sales of recycled aggregates in West Sussex 2009-2018

Year	Sales (tonnes)
2008	622,000
2009	629,000
2010	630,000
2011	446,000 ¹⁹
2012	446,000 ²⁰
2013	261,000 ²¹
2014	377,000 ²¹
2015	393,000 ²¹
2016	456,000 ²²
2017	391,000 ²²
2018	415,136
3-year average (2016-2018)	420,712
10-year average (2009-2018)	444,414

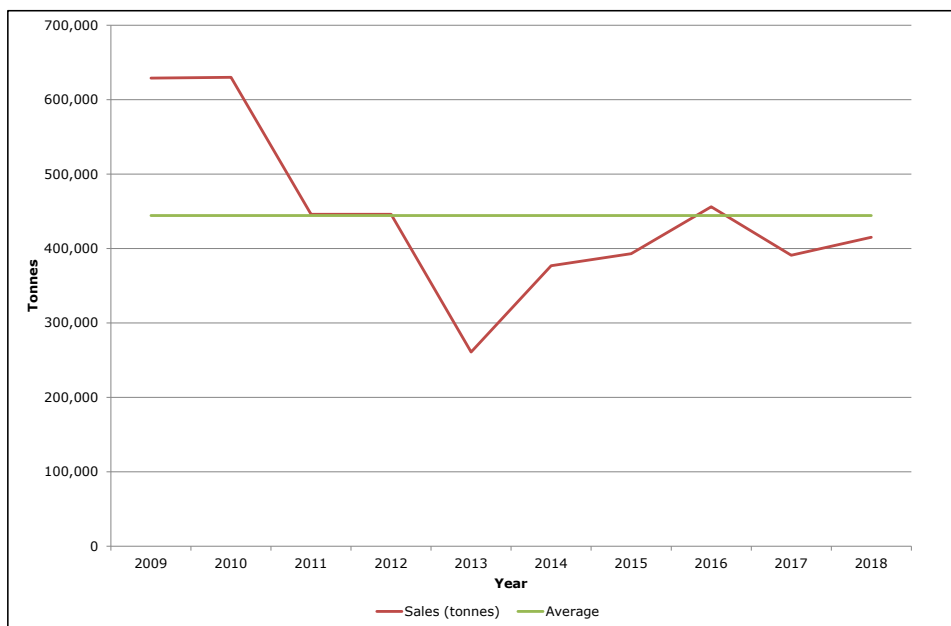


Figure 6: Sales of recycled aggregates in West Sussex 2009-2018

¹⁹ This figure was estimated as part of the work with the Waste Forecast Report (2012) for the Waste Local Plan. It provided a further breakdown of C&D waste to recycling and other management.

²⁰ Due to the lack of information from 2012 data, this is a rolled forward estimate on 2011. All the sites at the time were active and thus it is expected that recycling continued at similar levels to the previous year.

²¹ Figure was derived using a revised methodology prepared as part of the 'Review and Refresh of C&I and C&D Waste and CDEW Arisings and Projections in West Sussex' (BPP Consulting, 2016).

²² Figures derived using a revised methodology prepared as part of the Baseline for C&I and CDEW waste generated in West Sussex.

Current Capacity for Production of Recycled Aggregates

- 2.7.5 Recycled aggregate can be produced on sites at which demolition waste is produced by either using a mobile crusher and supplied directly, at intermediate temporary sites using a mobile crusher, or at a static site usually a mineral working or a waste management site. In 2018 there were estimated to be 19 static sites within West Sussex that have permission to produce recycled aggregates - capacity is provided by either dedicated CDEW recycling sites or at transfer stations. Table 16 shows that a total capacity of 529,250tpa for recycled aggregate production is permitted in West Sussex. Details of the sites can be found in the latest Annual Monitoring Report. It is important to note that since the assessment of capacity relates to consented static sites only the actual overall capacity for aggregate recycling in the County is likely to be significantly higher than that indicated above due to the contribution mobile and temporary production capacity might make.

Table 16: Permitted sites able to produce recycled aggregates

Site Type	Capacity (tpa)
Dedicated Aggregate recycling sites	276,000
Aggregate recycling at transfer stations	253,500
Total Capacity	529,500

- 2.7.6 Comparison between the difference of the 10-year average of sales (444ktpa) and estimated capacity (529,500ktpa) shows that capacity for producing recycled aggregate in the county appears to be underutilised. Demand scenarios have not been applied to this source of aggregate supply because the future availability of recycled aggregates may be constrained by availability of feedstock which is reliant on construction and demolition activity. In addition, the use of mobile processing facilities at development sites means that supply may respond to demand relatively quickly without express consent being required. Aggregate recycling sites within West Sussex are safeguarded through the Waste Local Plan (2014) to ensure continuity of supply.

Secondary Aggregates

- 2.7.7 In West Sussex, the by-products from chalk and sandstone have been used as secondary aggregates. Other sources of secondary aggregate extraction include bottom ash from thermal treatment facilities at the following sites.
- Planning permission has been granted for a waste treatment facility at Ford which includes a 140,000tpa gasification plant generating energy from waste (Ref: WSCC/096/13/F). The gasification process is estimated to produce 21,000 tonnes of residue ash each year which is to be transported off-site for recycling or concrete product manufacture.
 - The bottom ash from the 50,000tpa Energy from Waste plant at Lancing is processed into Incinerator Bottom Ash Aggregates (IBAA). In 2014, this amounted to 11,031 tonnes.

2.7.8 An estimate of the likely capacity for production of secondary aggregates has been calculated and is presented in Table 17. It presents the current capacity that exists within the County and two further scenarios that include the permitted site at Ford and a theoretical capacity which may arise if further thermal treatment plants are developed to meet the waste recovery requirements in the adopted Waste Local Plan (2014). Table 17 shows that there could be capacity for producing an estimated 56,000tpa of secondary aggregates in the County.

Recycled and Secondary Aggregates Summary

- Sales of recycled aggregates peaked at 630,000 tonnes in 2010. Data indicates that supply has been relatively steady since 2014, with sales in 2018 totalling an estimated 415,136 tonnes.
- The 10-year average production of recycled aggregate is **444,414 tonnes**.
- There is one site in West Sussex producing **11,000 tonnes** of bottom ash used as a secondary aggregate.
- A total of **529,500tpa** of capacity for recycled aggregates production is likely to be available within the County (2018 estimate) which indicates that **capacity within the county is underutilised**.
- There could be between **11,000tpa and 56,000tpa** of additional secondary aggregates production capacity in the County.

Table 17: Secondary aggregate capacity scenarios

Secondary Aggregate Recycling Capacity	Capacity Scenario 1 (Current Situation – Lancing Energy from Waste Plant) Figures in tonnes	Capacity Scenario 2 (Energy from Waste Plant + Ford Site) Figures in tonnes	Capacity Scenario 3 (Lancing Energy from Waste Plant + Ford Site + remaining capacity in WLP²³) Figures in tonnes
Lancing Energy from Waste	11,000	11,000	11,000
Ford Energy from Waste		21,000	21,000
Remaining sites in WLP			24,000 ²⁴
Total	11,000	32,000	56,000

²³ To meet the shortfall of non-inert recovery capacity of 270,000 as set out in Policy W1 of the Waste Local Plan 2014. The remaining capacity is calculated to be 130,000tpa (270,000 – 140,000 = 130,000tpa).

²⁴ An estimate of the amount of bottom ash that could be generated from the remaining WLP sites has been calculated using a conversion factor of 5.5. This is an average of the conversion factors of the Lancing and Ford Sites (4.5 and 6.6 respectively).

3. Balance between Demand and Supply

- 3.1.1 As previously stated, to be consistent with the NPPF the starting point for estimating future demand is information on sales over the previous 10 years and 'other relevant local information' (such as future demand for housing and other infrastructure). The authorities have considered 'other relevant local information' to calculate a figure for aggregate demand that factors in likely local changes in use of aggregate over the JMLP plan period, to 2033. A summary of the resulting forecasted demand (or LAA rates) is shown in Table 18. The LAA rates that are applied are those based on the highest levels of demand (i.e. 10-year average + the demand scenarios that result in largest theoretical increase in demand). Table 18 also presents the total estimated likely available supplies for aggregates and the net supply requirements.
- 3.1.2 West Sussex, and neighbouring authorities, are heavily reliant on imports to its wharves and railheads for crushed rock and marine sand and gravel. Indeed, imports of marine-won sand and gravel to the county appear to have compensated for reduced land-won sharp sand and gravel extraction. Historically soft sand in West Sussex has largely been met from land-won sources though data suggests that marine-won sand could possibly provide a source of supply in future (AM15, AM16, AM17). There is sufficient capacity in wharves and railheads to meet future demands for the importation of crushed rock and sand and gravel (see Table 18).
- 3.1.3 There are sufficient reserves of sharp sand and gravel to meet forecasted demand for this aggregate type and therefore no requirement for additional facilities are planned for through the JMLP (quarries, wharves, or railheads).
- 3.1.4 Soft sand has particular uses which are related to its particular qualities and so this is considered separately from sharp sand and gravel. As shown in Table 18, the demand for soft sand (based on average 10-year annual sales and other local relevant information) could be as high as 5,206,172 tonnes and current permitted reserves are 2,300,437. Therefore, there may be a shortfall of up to 2.91 million tonnes of soft sand to 2033. This shortfall is being address through the single issue soft sand review of the JMLP.
- 3.1.5 There is significant capacity for increasing levels of recycled and secondary aggregate production, with the 10-year annual average of production currently 444,414 tonnes, whilst the capacity is 529,500 tonnes per annum.

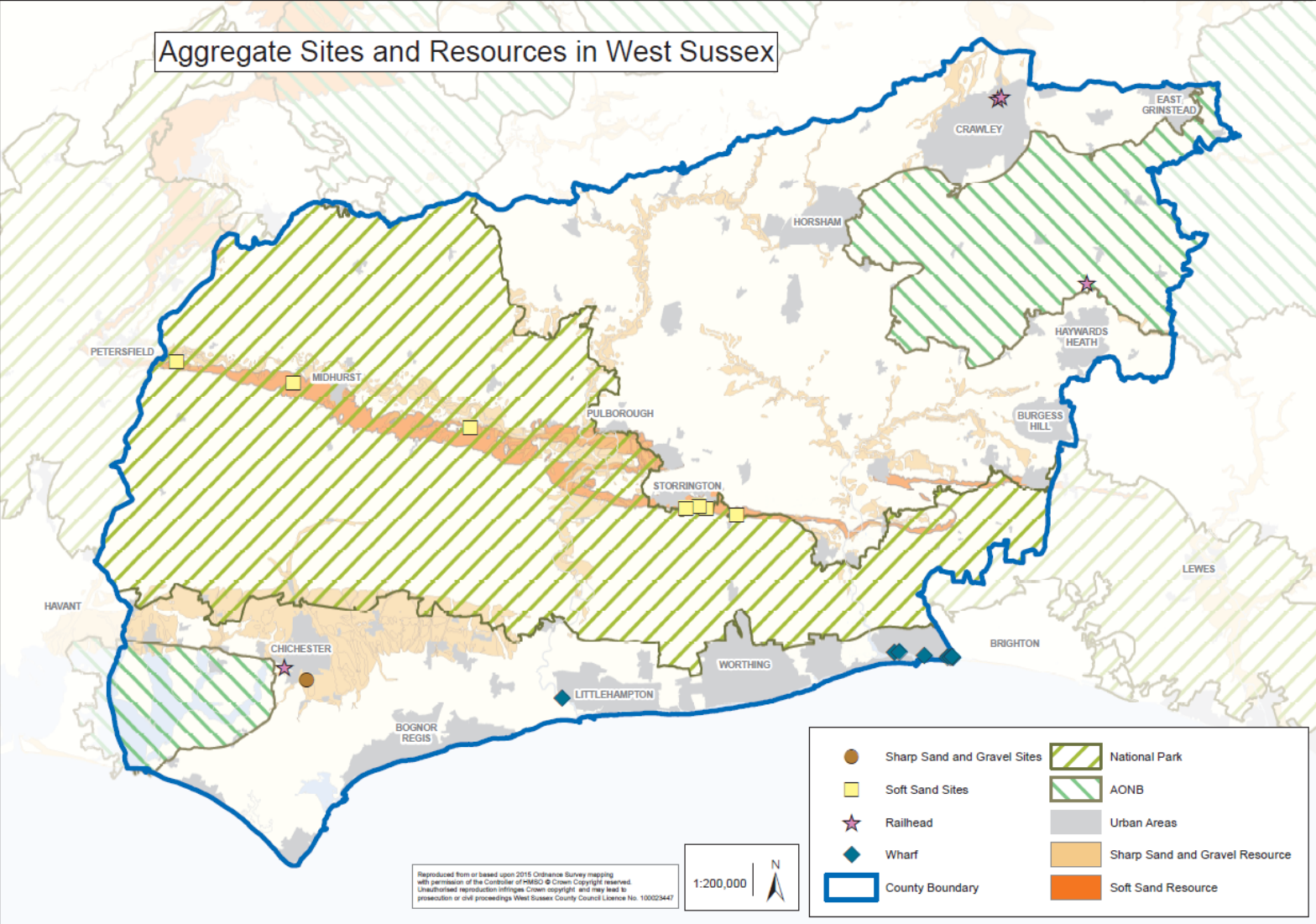
3.2 Proposed Monitoring Arrangements

- 3.2.1 Provision to meet demand for aggregate, as set out in this LAA is considered in the JMLP which was prepared jointly with the South Downs National Park Authority and adopted in July 2018. The LAA will be updated on an annual basis as part of the Annual Monitoring Report.

Table 18: Total demand for all sources of aggregate over the JMLP period (2019-2033)

Aggregate	10-year Average Sales/Landings (2009-2018) (tonnes)	Total Requirement to 2033 based on 10-year Average Sales/Landings (tonnes)	LAA Rate (Maximum Estimated Annual Requirement based on Highest Demand Forecasts)	Total Maximum Requirement to 2033 (based on LAA Rate)	Total Estimated Supply (tonnes) or Capacity	Net Additional Requirement (tonnes) (-ve values = surplus)
Sharp Sand and Gravel	22,663	317,285	35,581	498,138	795,000 (Permitted Reserves)	-296,862
Soft Sand	288,718	4,042,059	371,869	5,206,172	2,300,437 (Permitted Reserves)	+2,905,735
Marine-won Sand and Gravel	1,106,153 (landings)		1,736,660		Total annual operational capacity: 2,070,000	Annual capacity surplus: 166,969
Crushed Rock (landed at wharves)	105,621 (sales)		166,371			
Crushed Rock (rail imported)	610,134		957,910		Total annual capacity: 1,380,000	Annual capacity surplus: 238,412
Sand and Gravel (rail imported)	116,992		183,678			
Secondary and Recycled Aggregates	444,414				529,500	Annual capacity surplus: 85,086

Appendix A: LAA Map



Appendix B: Effect of Housing and Road Construction on Aggregate Supply and Demand

B1. The CLG/BGS (June 2019) Mineral Planning Factsheet: Construction Aggregates sets out an overview of aggregate supply in the UK, and its main purpose is to inform the land use planning process. Table 1 of the factsheet sets out the principal uses of primary aggregates in Great Britain, based on sales in 2014. This has been used to calculate the amounts of sand and gravel (including soft sand) and crushed rock that may be used in both housing and highways maintenance/improvements. The data indicates that:

- 88% of total sand and gravel (including soft sand) sold may be used in the construction of homes;
- 36% of total crushed rock sold may be used in the construction of homes;
- 37% of total sand and gravel (including soft sand) may be used in the construction and maintenance of roads;
- 81% of total crushed rock sold may be used in the construction and maintenance of roads.

B2. In light of this, when assessing the future demand for aggregate it is considered reasonable to assume that changes to the construction and maintenance of housing and roads will have an important effect.

B3. The LAA sets out how this has been factored into various demand scenarios for different aggregate types and this appendix shows how the relevant percentage factors applied have been derived.

Housing

B4. Housing completion data indicates that an average of 3,406 dwellings have been built annually in West Sussex over the 10-year period of 2009/10 – 2018/19. Meanwhile, planned housing, based on an analysis of existing or emerging local plans of local planning authorities within West Sussex, suggests that 4,114 dwellings will be built per annum up until 2033. This represents an increase of 20.8% when compared to the 10-year average.

B5. As aggregates are transported across administrative boundaries, future housing development in neighbouring areas may also influence the demand for aggregate and so needs to be considered. Table B1, therefore, sets out planned housing in West Sussex as well as all neighbouring areas, and shows the percentage change when compared to actual housing completions.

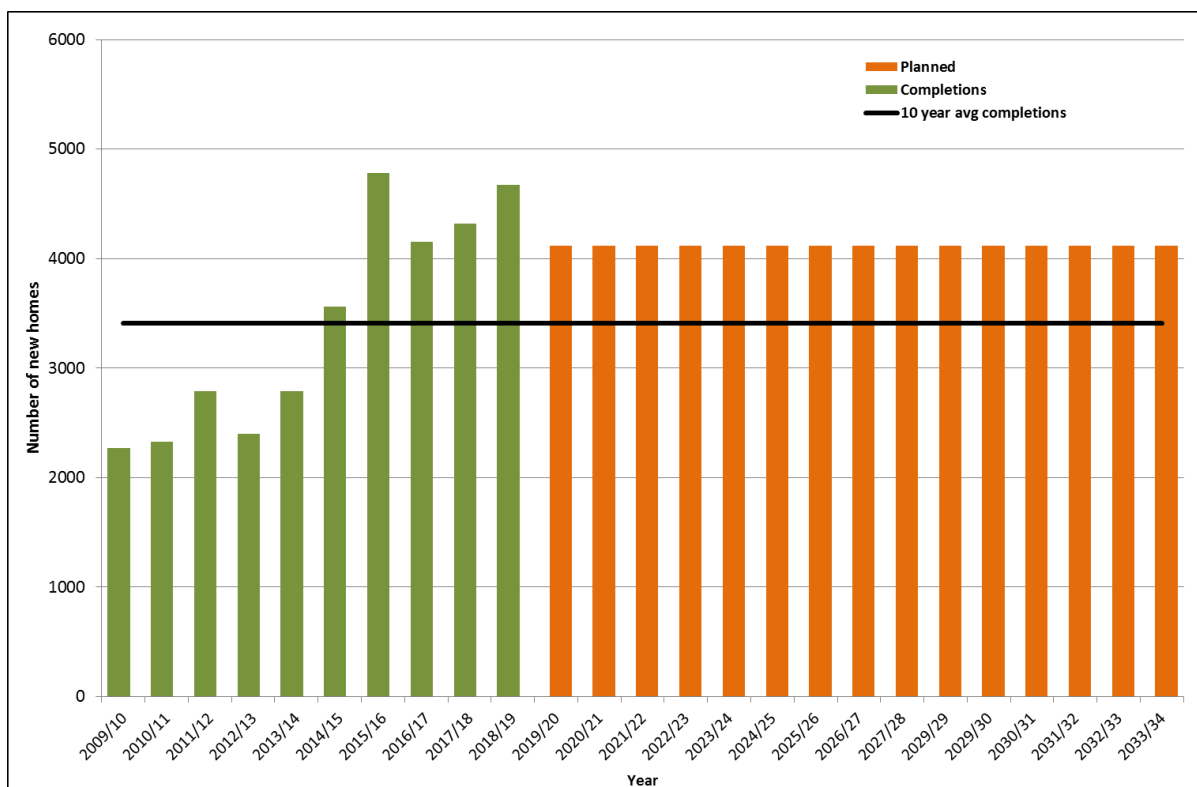


Figure B1: Planned and completed housing in West Sussex (2009/10-2033/34)

Table B1: Planned housing growth in West Sussex and Neighbouring Areas

Area	Average Completions per annum (2009/10-2018/19)	Average Planned Housing per annum (2019-2033) ²⁵	% Change
Brighton & Hove	455 ²⁶	812	78.3%
East Sussex	1,267 ²⁷	2,069	63.3%
Hampshire	5,458 ²⁸	7,008	28.4%
Surrey	2,710 ²⁹	3,118	15.1%
West Sussex	3,406	4,114	20.8%
Average for West Sussex, East Sussex, Brighton & Hove, Surrey, and Hampshire	13,296	17,121	28.8%

²⁵ Planned housing data is based on various D&B Local Plans, with data rolled forward to match JMLP plan period to give estimates of average planned housing per annum.

²⁶ Brighton & Hove City Council, Authority Monitoring Report (2017-18) covering the 10-year period 2008/09 –2017/18

²⁷ East Sussex County Council, East Sussex Figures website, and MCLG Housing Live Tables accessed October 2019

²⁸ Hampshire County Council, Land Availability Monitoring System, and MCLG Housing Live Tables accessed October 2019

²⁹ Surrey County Council, Surrey-I website, and MCLG Housing Live Tables accessed October 2019

B6. If the number of housing completions is to increase, then it might be reasonable to assume that the demand for aggregates needed to build this housing will also increase. Table B1 shows that a 20.8% increase in housing completions will occur in West Sussex, and for other neighbouring authorities, this number may be as high as 28.8%, which has been factored into the demand scenarios. During the previous 5 years, the West Sussex figure has been applied, however the average of the neighbouring authorities is considered suitable as West Sussex requirements have fallen. This is because it is known that West Sussex is a net- exporter of aggregates, therefore applying the higher figure is prudent, and has been., set out within this LAA, against the 10-year average of sales of for aggregates (where relevant).

Planned Highway Improvement (Crushed Rock)

B7. Evidence has been gathered on planned highway improvement and maintenance works, which require aggregate (generally crushed rock) use. Trunk roads are managed by Highways England, and non-trunk roads are managed by the Highways Authority (WSCC).

Non-Trunk Roads

B8. An indication of the level of non-trunk road construction and maintenance for the previous 10 years in West Sussex is provided by an analysis of the highways & transport revenue & capital expenditure. This shows an annual average spend of £44.6M during the period 2009/10 – 2018/19 (see Figure B2).



Figure B2: West Sussex highways and transport capital and revenue expenditure (2009/10-2018/19)

B9. There is limited information available on anticipated long-term highways spending, with the only information readily available relating to grants from the Local Growth Fund for the period 2015-2021. This relates to those schemes

which are named and committed, as set out in the Coast to Capital Growth Deal. West Sussex local transport funding is set out in Table B2.

Table B2: West Sussex Local Transport Funding Sources

Year	Construction (£m) ³⁰	Maintenance (£m) ³¹	Local Growth Funding (£m) ³²	Total (£m)
2011/12	4,292	10,519	n/a	14,811
2012/13	4,578	10,447	n/a	15,025
2013/14	4,578	10,610	n/a	15,188
2014/15	6,348	10,043	n/a	16,481
2015/16	3,734	13,723	1,524	18,981
2016/17	3,734	12,581	606	16,921
2017/18	3,743	12,200	2,172	18,106
2018/19	3,734	11,043	2,852	17,629
2019/20	3,734	11,043	7,866	22,643
2020/21	4,944	11,043	45,585	61,572
2021/22 ³³	4,944	11,043	36,787	52,774
2022/23 ³⁴	4,944	11,043	4,500	20,487

B10. Evidence from the Local Growth Funding, which is expected in West Sussex, suggests an average increase of £12.5M per annum³⁵. Between 2011 and 2015, the average local transport spending per annum was £16.1M, whilst the average spending between 2016 and 2023 is expected to be £28.6M per annum. This is a total increase of £12.5M during the period 2016-2023 when compared to 2011-2015. **This equates to an increase of 28.2%³⁶ when compared to previous spending levels.**

B11. Due to the fact that East Sussex and Brighton & Hove rely on crushed rock landed at wharves at Shoreham to meet demands for aggregates in highways works, an assessment of spending was considered for those areas also (Table B3).

³⁰ DfT – Integrated Transport Block Capital Grant (March 2014). Indicative figures for the period 2015/16 to 2020/21

³¹ DfT – Highways maintenance funding allocations: 2015/16 to 2020/21 (December 2014).

³² Named and committed schemes, as set out in the Coast to Capital Growth Deal, taking account of updated information on the schemes on total spending planned.

³³ The data used for construction and maintenance have been rolled forward and are therefore a best guess.

³⁴ The data used for construction and maintenance have been rolled forward and are therefore a best guess.

³⁵ The average between 2015/16 and 2022/23 from Growth Funding.

³⁶ £9.9M equates to 28.2% of the 10-year average spending on highways construction and maintenance.

Table B3: East Sussex and Brighton & Hove Local Transport Funding Sources

Year	Construction (£m) ³⁷	Maintenance (£m) ³⁸	Local Growth Funding (£m) ³⁹	Total (£m)
2011/12	12,664	6,324	n/a	18,988
2012/13	12,233	6,971	n/a	19,204
2013/14	11,318	6,744	n/a	18,062
2014/15	12,221	8,034	n/a	20,255
2015/16	5,978	12,254	13,500	32,732
2016/17	5,978	12,150	19,000	37,128
2017/18	5,978	11,783	20,000	37,761
2018/19	5,978	10,665	8,000	24,643
2019/20	5,978	10,665	8,000	24,643
2020/21	5,978	10,665	8,000	24,643

B12. The local growth funding for East Sussex and Brighton & Hove is estimated to be on average £12.75M per annum during the period 2015-2021. When compared to previous spending, it is calculated that the increase in Local Growth Funding equates to **51.7%** during at least the first five years of the Joint Minerals Local Plan's Plan period, when compared to the 10-year average spend (£21.5M).

B13. For the purposes of establishing possible future aggregate demand scenarios that may result from an increase in highways maintenance and construction, a growth factor has been applied to crushed rock sales as crushed rock is the type of aggregate used in this activity. In 2009, 199,000 tonnes of crushed rock were sold in East Sussex and Brighton & Hove of which, 1%, was imported from West Sussex. Although imports of crushed rock at East Sussex have begun at Newhaven Depot, importation of crushed rock from West Sussex is expected to continue, although there were no obtainable records from the 2014 National survey. To take account of the exports of crushed rock to East Sussex, the proportion of crushed rock coming from West Sussex (1%) has been forecast to grow by 51.7% (i.e. to 1.52%) (See marine landed crushed rock demand scenarios 4 and 5, Table 12).

Trunk Roads

B14. The average annual spend on the improvement and maintenance of trunk roads in West Sussex is difficult to ascertain due to the short term and commercial nature of the contracts between Highways England and the Area contractors. Highways England has confirmed that there will be a requirement for surfacing materials, and hence aggregates, over the lifetime of the new contract. The amount of aggregate required for trunk road improvement schemes will be dependent on future Government budget allocations, which have

³⁷ DfT – Integrated Transport Block Capital Grant (March 2014). Indicative figures for the period 2018/19 to 2020/21.

³⁸ DfT – Highways maintenance funding allocations: 2015/16 to 2020/21 (December 2014).

³⁹ Named and committed schemes, as set out in the Coast to Capital Growth Deal (July 2014)

not yet been announced. The following trunk road improvement schemes are proposed in West Sussex:

- A27 Chichester improvement;
- A27 Worthing to Lancing improvements;
- A27 Arundel bypass.

B14. As these kinds of improvement works have been undertaken in the past and are therefore reflected in data on past demand, it is considered reasonable to assume that aggregate demand for trunk road maintenance and improvements in future will not increase future demand.

Future Demand for Aggregates Use in Roads

B15. For the purposes of forecasting future demand for aggregates use in roads, the assumption being made is that, if spending on the construction and maintenance of roads is to increase by 28.2% (in West Sussex), the demand for aggregates will also increase by 28.2%. This factor has therefore been used in the demand scenarios, set out within this LAA, against the 10-year average of sales of Crushed Rock. A further two demand scenarios for marine landed crushed rock have been prepared to account for demand from East Sussex and Brighton & Hove.

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