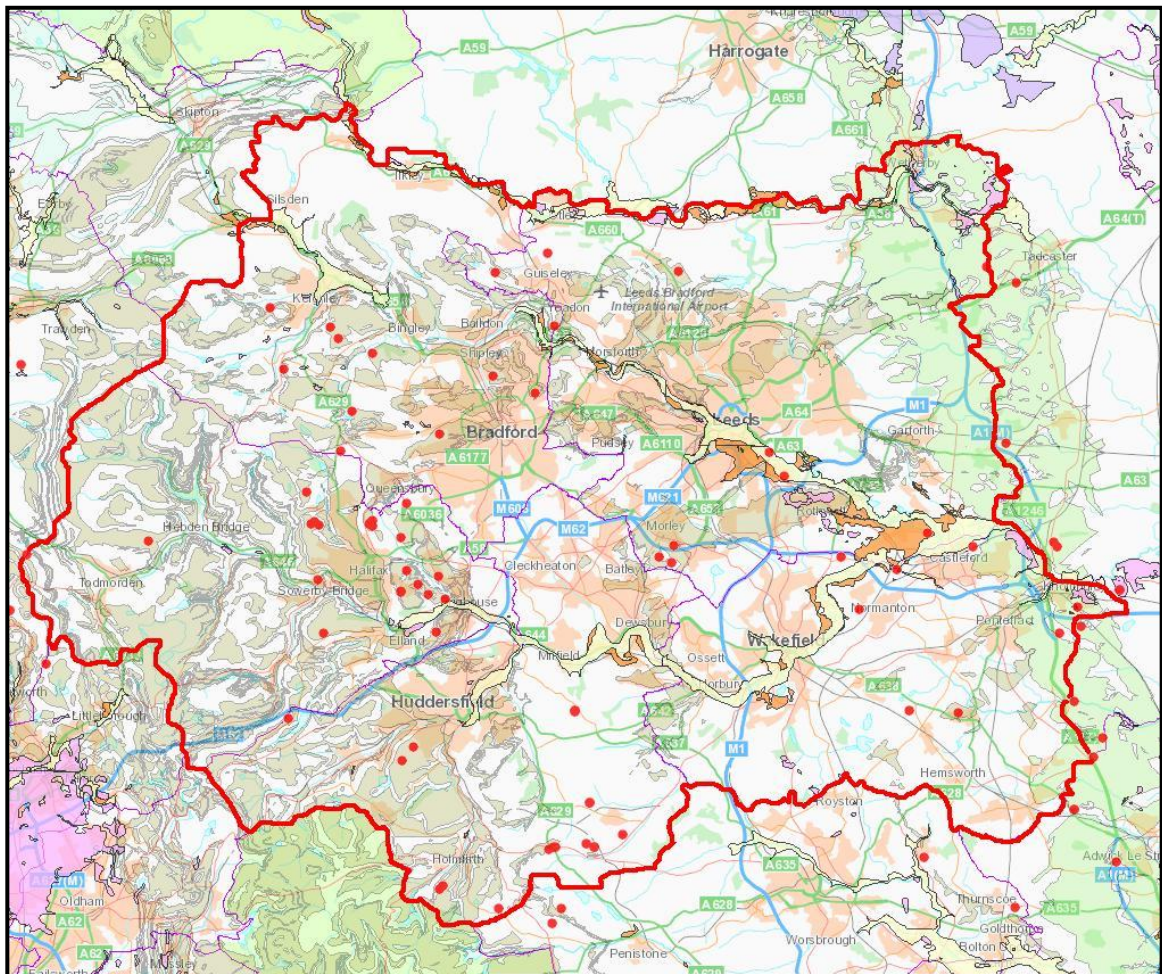




Local Aggregate Assessment for West Yorkshire 2017 (2016 Data)



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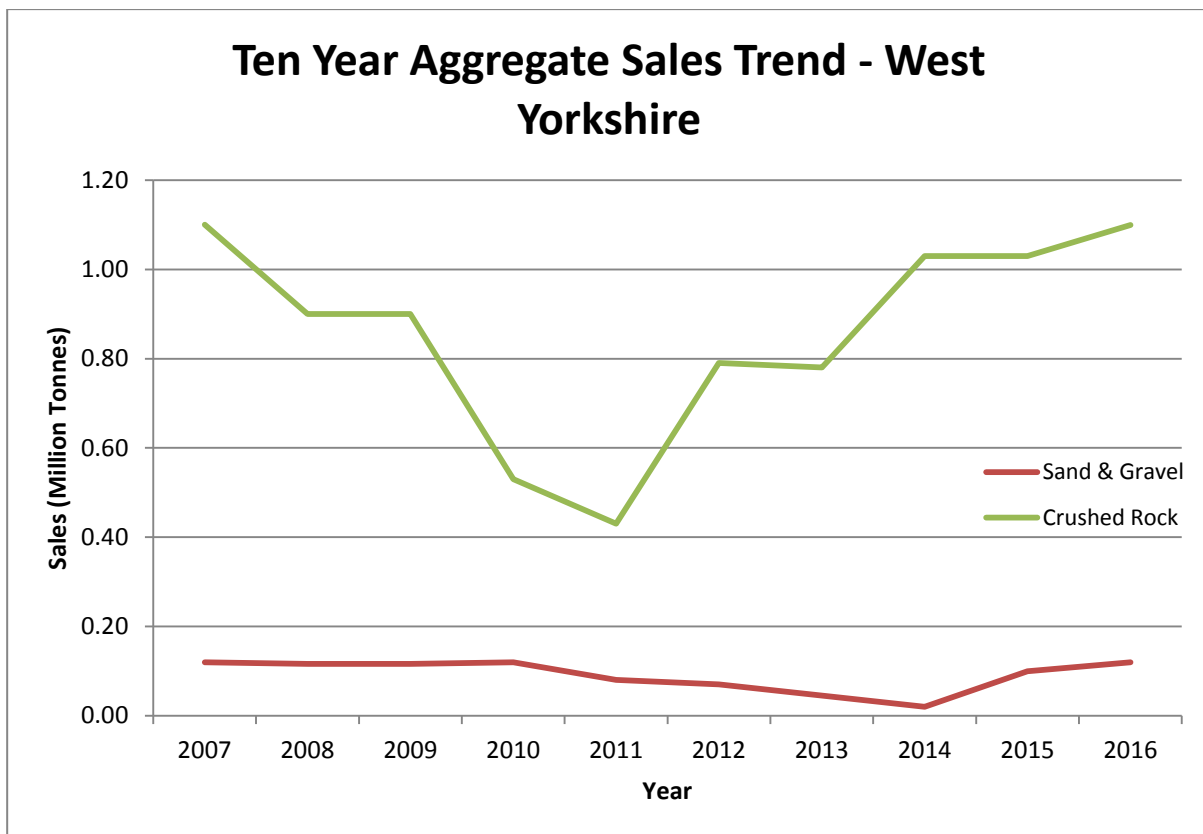
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EXECUTIVE SUMMARY

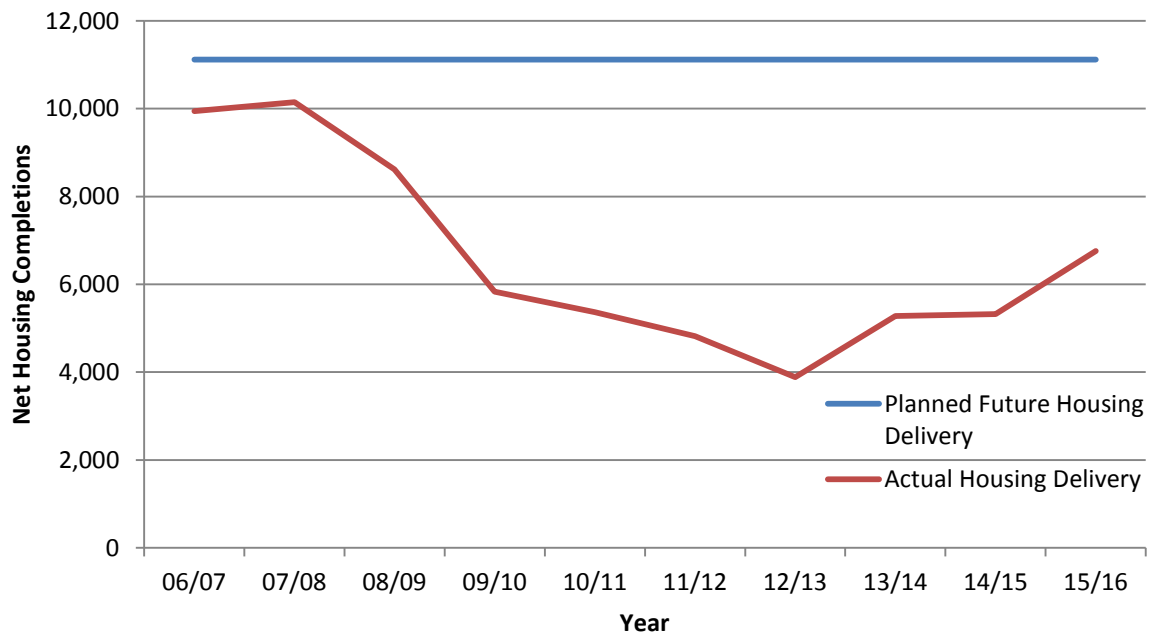
This document is the fifth of the annual Local Aggregate Assessments (LAA) undertaken by the West Yorkshire Combined Authority on behalf of the five West Yorkshire Mineral Planning Authorities of: Leeds, Bradford, Kirklees, Wakefield and Calderdale. An LAA is an annual report designed to provide evidence to support both the Minerals Industry and Mineral Planning Authorities in planning for the future provision of aggregates. The LAA should be updated annually and this document represents the Local Aggregate Assessment for West Yorkshire 2017, incorporating 2016 data.

The LAA 2017 finds that the previously identified trend of declining sand and gravel sales has continued to improve marginally; however total primary sand and gravel sales from West Yorkshire remain at a very low level relative to consumption and relative to historic supply levels. The recovery of the West Yorkshire crushed rock aggregate quarrying industry from its slump between 2008 and 2011 is also continuing with sales for 2016 reaching pre-recession levels at 1.1 million tonnes. The chart below illustrates the 10 year aggregates sales trend for West Yorkshire.

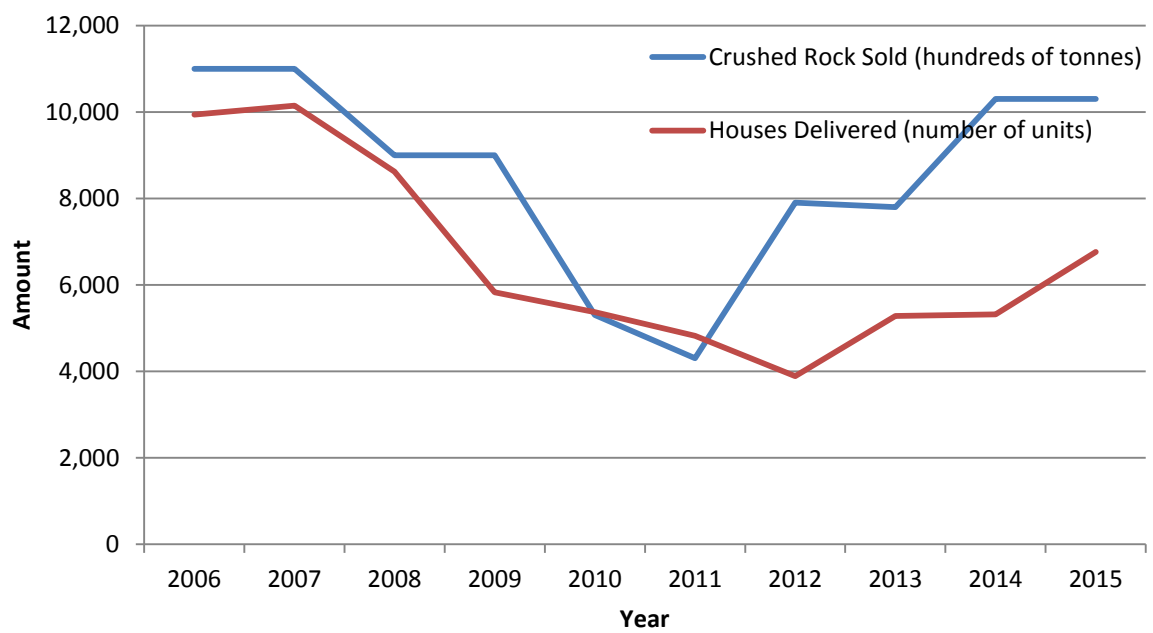


Ten year sales averages alone are not considered to be adequate to use as the basis for calculating the aggregate landbank for West Yorkshire. This is both because of the obvious effect of the recession on the sales average for crushed rock aggregates and because West Yorkshire Local Planning Authorities are planning for a significant increase in house building in the future, as illustrated in the first chart overleaf. A strong relationship is apparent between housing delivery and aggregate production, as shown in the second chart overleaf.

Historic Annual Housing Delivery vs. Planned Future Delivery in West Yorkshire



Aggregate Sales vs. Housing Delivery Trend in West Yorkshire



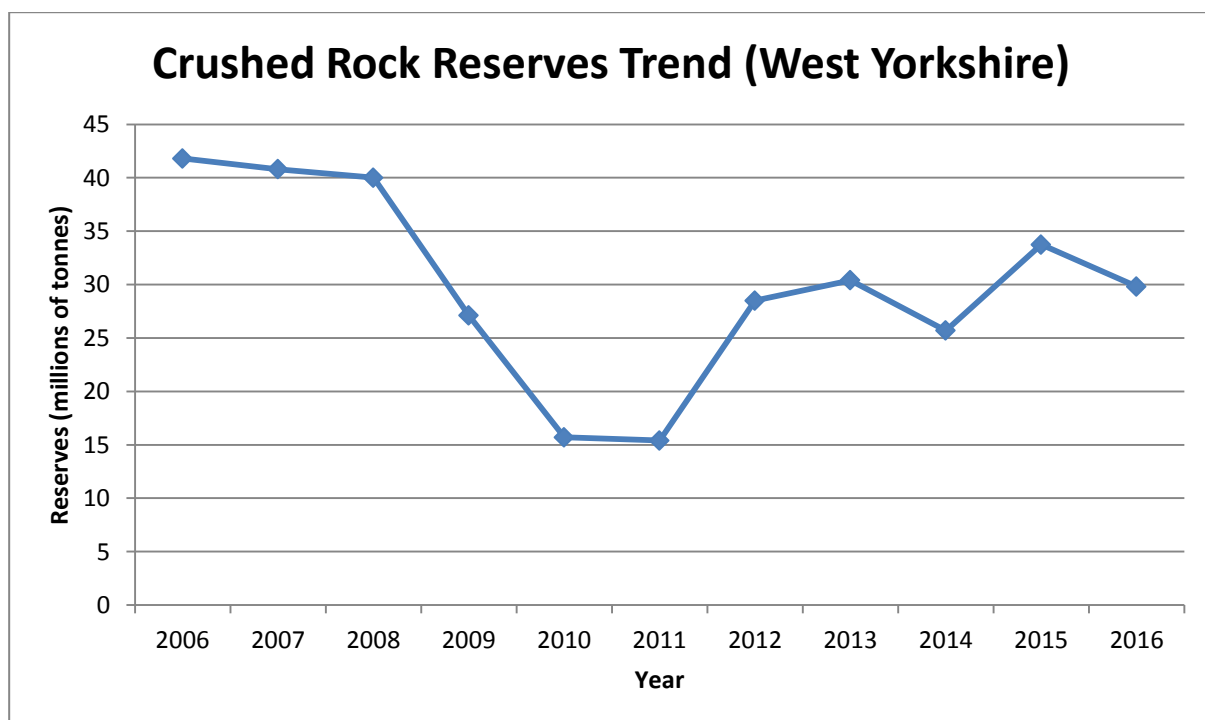
Therefore an uplift factor has been applied to the 10 year aggregate sales average for the purpose of calculating the West Yorkshire Aggregate Landbank which represents an estimate of the increase in aggregates sales which would be required to deliver on planned future housing growth and associated infrastructure demands. The calculated landbanks, adjusted in accordance with this uplift methodology, are shown in the table below.

West Yorkshire Aggregate Landbanks 2016

Note: All Figures in Tonnes Unless Otherwise Stated	Reserve	Annual Sales Average 2007-2016	35% Uplifted Aggregate Apportionment	Landbank
Sand and Gravel	770,000	90,000	120,000	6 Years 5 Months
Crushed Rock	29,820,000	860,000	1,160,000	25 Years 8 Months

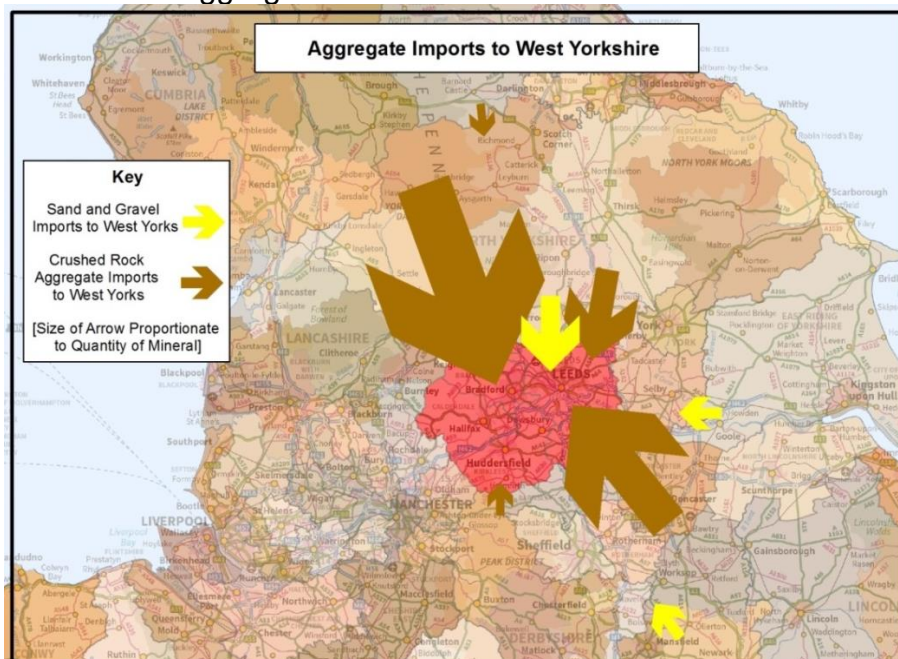
The Sand and Gravel landbank of **6 Years and 5 Months** has now fallen below the minimum landbank required by paragraph 145 of the National Planning Policy Framework (NPPF). Although the sand and gravel landbank appears to be close to meeting the minimum level required by the NPPF, this primarily reflects the sustained low level of sand and gravel extraction in West Yorkshire. The sand and gravel landbank figure should not be taken to imply in any way that supplies of the sand and gravel consumed within West Yorkshire (primarily from North Yorkshire) are secure.

The crushed rock aggregate landbank of **25 Years and 8 Months** remains significantly greater than the 10 year minimum required by the NPPF; however, as illustrated by the chart below, crushed rock reserves remain substantially below pre-recession levels and should not therefore necessarily be seen as excessive or problematic.



It should also be noted that the landbank length guidelines included within the NPPF are minimums not maximums. Mineral Planning Authorities, including West Yorkshire Authorities and those neighbouring authorities who supply significant quantities of aggregate into West Yorkshire (as illustrated by the minerals flow diagram below), should also consider other relevant information when assessing the need for the release of additional aggregate reserves. 5.12. Key Messages and relevant considerations when assessing proposals and allocations for minerals development and associated infrastructure:

- i. The unsuitability of a substantial proportion of the currently permitted reserves of crushed rock aggregate within West Yorkshire for higher specification uses, such as concrete making and roadstone.
- ii. The continuing dependence of West Yorkshire upon neighbouring authorities for the majority of its construction aggregate needs, particularly in relation to concrete and roadstone grade crushed rock aggregates and concrete grade sand and gravel.
- iii. The reliance of West Yorkshire upon high specification crushed rock sourced from the Yorkshire Dales National Park; an area where the NPPF indicates extraction should be reduced (as far as is practicable).
- iv. The relatively low contribution which West Yorkshire currently makes to the overall supply of construction aggregates within the Yorkshire and Humber Region, particularly in relation to sand and gravel.
- v. The benefits of pursuing any sustainable opportunities to contribute towards the supply of the generally lower specification aggregates produced within West Yorkshire, and continuing to provide facilities for the production of recycled aggregates, in terms of compensating for West Yorkshire’s economic dependence upon primary aggregates quarried from neighbouring authorities.
- vi. Production of sand from crushed rock and blockstone quarries as an additional/alternate source of sand.
- vii. The need to safeguard existing rail and wharf infrastructure and identify potential new locations for wharves and rail depots within West Yorkshire to facilitate the sustainable transportation of both land won and marine aggregates into West Yorkshire in the future, particularly crushed rock aggregates from the Yorkshire Dales and marine aggregates landed at the Humber Docks.



1. INTRODUCTION/ BACKGROUND

1.1. Background

- 1.1.1. Minerals are important to the local and national economy and underpin the fabric of our everyday lives. Uses of minerals range from building stones, to brick clay, to chemical and construction aggregates. Maintaining continuity of supply of aggregates is particularly vital to the economic wellbeing of the country and therefore the English planning regime provides for a specific managed aggregate supply system based upon Local Aggregate Assessments (LAAs).
- 1.1.2. All of the local authorities within England which have responsibilities for minerals planning (Minerals Planning Authorities – MPAs) are required to plan for a steady and adequate supply of aggregates by:
 - preparing an annual Local Aggregate Assessment, either individually or jointly by agreement with another or other mineral planning authorities, based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine dredged, secondary and recycled sources), and;
 - participating in the operation of an Aggregate Working Party and taking the advice of that Party into account when preparing their Local Aggregate Assessment;
- 1.1.3. Naturally occurring aggregate minerals in West Yorkshire are limestone, sandstone and sand & gravel. It is the future provision of these minerals with which this assessment is concerned. The LAA is intended to provide evidence to inform both MPAs, in exercising their forward plan making and Development Management functions, and the Minerals Industry, in planning their future investment decisions and informing planning application assessments.
- 1.1.4. National Planning Practice Guidance confirms that a Local Aggregate Assessment should contain three elements:
 - a forecast of the demand for aggregates based on both the rolling average of 10-years 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 throughputs 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 a surplus of supply and, if the former, how this is being addressed.
- 1.1.5. In addition to the government's planning practice guidance it should be noted that the Planning Officers' Society and the Mineral Products Association jointly published a Practice Guidance Document on the

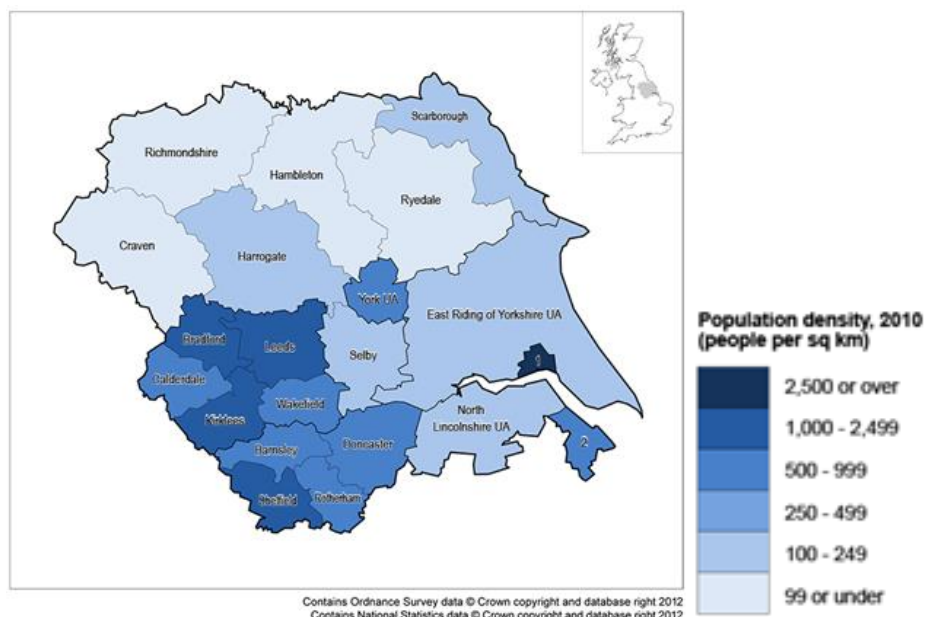
Production and Use of Local Aggregate Assessments in April 2015, updated in May 2017. Although non-statutory this document provides a very useful health check to ensure the robustness of an LAA.

- 1.1.6. This LAA document is the fifth of the annual LAAs undertaken by the West Yorkshire Combined Authority on behalf of the five West Yorkshire Local Authorities: Bradford, Leeds, Wakefield Kirklees and Calderdale, who, as Unitary Authorities, are responsible for Minerals Planning in the West Yorkshire sub-region.
- 1.1.7. The LAA will be submitted to the Yorkshire and the Humber Aggregates Working Party (AWP), an advisory body made up of MPAs across the region, the aggregates industry and other relevant expert organisations, for consideration and scrutiny. The AWP has a role in monitoring the operation of the LAA system through providing technical advice.
- 1.1.8. Following stakeholder consultation and the implementation of any necessary amendments, the West Yorkshire Local Aggregates Assessment 2017 will be presented to the West Yorkshire Combined Authority/ Leeds City Region Portfolio Holders Board for formal ratification.

1.2. Geographical Context

- 1.2.1. West Yorkshire is located in the north of England in the Yorkshire and Humber Region. West Yorkshire is heavily urbanised accommodating 42% of the 5.4 million person population of the Region within 13% of the Region’s total land area. Figure 1 below is a population density map produced by the Office of National Statistics which illustrates the high population density in West Yorkshire relative to other parts of the Region.

FIG1



- 1.2.2. South Yorkshire has many geographic similarities with West Yorkshire; however the counties of north and east Yorkshire contain much lower levels of urban development, but with consequently increased accessibility of mineral resources.
- 1.2.3. The Office of National Statistics estimates that West Yorkshire currently has a population of 2,307,000 and that by 2037 West Yorkshire's population will have increased by 222,000 to 2,529,000 people, an increase of 10% with a corresponding increase in households¹. Please note that this estimated population increase is based upon 2014 data and has been revised down by 2% from the previous estimate set out in the 2016 LAA, which was based upon 2012 data.
- 1.2.4. This population and household growth, will, in turn, create the need for new homes, employment opportunities and improvements in transportation and other infrastructure. It is crucial that the West Yorkshire authorities are able to identify a sufficiency of mineral supply to successfully accommodate these growth projections.
- 1.2.5. Given its minerals resource limitations and heavily urbanised nature West Yorkshire is not able to independently meet the high aggregate consumption requirements of the modern construction industry, particularly in terms of concreting aggregate and roadstone. Therefore minerals flows into West Yorkshire are considered to be of greater significance than indigenous production in terms of safeguarding adequate and steady supplies of the aggregates consumed by the West Yorkshire economy.

1.3. Transportation of Aggregates

- 1.3.1. The M62 motorway and trans-Pennine railway line provide east west transportation links between West Yorkshire, East Yorkshire and Manchester/ Liverpool to the West. The M1/ A1(M) and the east coast mainline provide north-south links between West Yorkshire and York, Newcastle and the wider North-West Region to the north and Sheffield, Derbyshire, Nottinghamshire, London and the South-East to the south.
- 1.3.2. Commercial canal/ waterway connectivity and associated wharf infrastructure still remains in place to the east of Leeds, allowing potential waterway commerce connections between West Yorkshire and the Humber Docks via Goole. Although the Leeds-Liverpool canal remains well used for leisure traffic the infrastructure is not currently in place to allow similar commercial waterway goods transportation between West Yorkshire and Manchester/ Liverpool to the west.
- 1.3.3. The vast majority of aggregate is distributed within or arrives in West Yorkshire by road based heavy goods vehicles. Locally, quarry vehicles can be the predominant goods vehicle on the road network at certain times of day, or can significantly add to road congestion. Issues associated with the transportation of minerals by road are frequently one of the main causes for

¹ ONS, May 2016, Subnational Population Projections for Local Authorities in England: Table 2

community concern in relation to minerals development; however alternative modes of transportation (rail or barge) frequently prove to be unviable.

- 1.3.4. This reliance on distribution of aggregates by road increased further in 2013 with the closure of the Lafarge wharf at Whitwood (Wakefield) which previously imported sand and gravel by barge from the Trent. Lafarge indicated that the closure was due to their merger with Tarmac, which gave them access to more local quarries to supply their concrete works. However an application for the development of a further new aggregate wharf at Haigh Park Road, Stourton, was approved by Leeds City Council on 02 April 2015. This new wharf is expected to distribute approximately 2,000 tonnes per week of aggregate (sand and gravel) arriving from the Humber Ports. Additionally 2 other operational wharves remain in Leeds at Fleet Lane and Knostrop.
- 1.3.5. Crushed rock limestone is also imported by train from Buxton to Stourton (Leeds) and from Dry Rigg, Acrow, Ingleton and Swinden Quarries to Cross Green (Leeds). The two aggregate offloading facilities at Cross Green are operated by Tarmac and Hanson the Stourton facility is operated by Cemex. It is also understood that some aggregate and cement is bought by rail to the Construction Materials plant at Bretton Street in Dewsbury. All these terminals also distribute aggregate by road to other local sites.
- 1.3.6. The adopted Yorkshire Dales National Park Local Plan seeks a minimum 50% reduction in road traffic from quarries in the National Park. It is therefore essential, if West Yorkshire is to rely on stone from quarries in Yorkshire Dales National Park, that the existing rail depots are retained and potential new sites are safeguarded.
- 1.3.7. Leeds City council have confirmed that the Cemex aggregate rail depot in Leeds is likely to be lost due to the impact of HS2 and that the development of additional rail aggregate offloading infrastructure in Leeds will be required to compensate for this capacity reduction. Although a site has been allocated to provide additional rail offloading capacity in Leeds, evidence indicates that there will remain a shortfall in aggregate rail offloading capacity to serve West Yorkshire.
- 1.3.8. In recognition of the importance of maintaining existing minerals rail and waterway transportation infrastructure and promoting any further opportunities to move minerals off public roads, Leeds Natural Resources and Waste Local Plan includes policies which safeguard existing and potential rail sidings and several existing and potential wharf sites. However challenges have been experienced in relation to the implementation of this policy due to competing pressures for housing development. The Leeds policy also allows for safeguarded sites to be used for alternate development if it can be demonstrated that the site is unlikely to be used for freight purposes.
- 1.3.9. In addition Policy TR6: Freight, within Bradford's Local Plan Core Strategy, which has now been adopted by Bradford Council, sets a commitment to: *Encourage the protection of rail connected land for future uses that require*

rail freight use and seek to encourage the development of intermodal interchanges and improvements to multi-modal transfer facilities.

- 1.3.10. The Calderdale Local Plan Initial Draft confirms that, given the geography and current physical infrastructure of Calderdale, alongside the nature of the local quarrying industry, it is not intended to safeguard the transport element of the minerals supply chain. However a general minerals infrastructure safeguarding policy for Calderdale is proposed through draft policy MS3.
- 1.3.11. The Kirklees Publication Draft Local Plan proposes to safeguard several specific minerals transportation facilities through proposed policy PLP 39 including: a former coal and aggregates depot and a cement depot with rail spurs in Dewsbury, a former Coal Wharf on the Calder & Hebble Navigation and former railway sidings in Huddersfield. There are currently no wharf or rail siding safeguarding policies set out in the adopted Wakefield Local Development Framework.

1.4. National Parks and Areas of Natural Beauty

- 1.4.1. The NPPF indicates that when determining planning applications, local planning authorities should, as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks. The West Yorkshire sub-region does not include a significant amount of national park land, other than a slight overlap of the Peak District National Park into the far southern periphery of Kirklees. However this small area of National Park within West Yorkshire contains no active minerals extraction sites.
- 1.4.2. Nonetheless it is known that West Yorkshire does receive significant quantities of high specification crushed rock aggregate from quarries within the Yorkshire Dales National Park (YDNP) and Nidderdale Area of Natural Beauty (AONB), some of which is transported into Leeds by rail. Recently published British Geological Survey data indicates that, of the 2.5 million tonnes of crushed rock estimated to have been consumed within West Yorkshire in 2014, in the region of 900,000 tonnes (35%) was quarries within the Yorkshire Dales National Park (see section 4.1 below).
- 1.4.3. Very significant reserves exist in the YDNP capable of continuing to supply markets at existing rates for many years. However no apportionment has been set within the North Yorkshire LAA to continue this supply of crushed rock aggregates from the Yorkshire Dales into the future. Additionally the adopted Yorkshire Dales National Park Local Plan proposes to restrict the development of new crushed rock quarries or the extension of existing quarries into areas of undisturbed land other than in exceptional circumstances.
- 1.4.4. Lesser, but still significant quantities of crushed rock aggregates are transported into West Yorkshire from limestone and gritstone quarries within the Peak District National Park. The Peak District Local Plan Core Strategy imposes a still tougher planning policy framework for new and

extended minerals workings. Policy MIN1 confirms that proposals for new mineral extraction or extensions to existing mineral operations (other than fluorspar proposals and local small-scale building and roofing stone) will not be permitted other than in exceptional circumstances. The most recent Local Aggregates Assessment covering the Peak District (2016) confirms that a number of Peak District quarries have closed within recent years.

- 1.4.5. In the longer term alternative resources may therefore be required and, if new resources are not identified, this would have implications for the maintenance of the supply of the aggregates, and in particular high specification aggregates, consumed within West Yorkshire. The high specification sandstone aggregate produced within the Yorkshire Dales National Park is of a quality which cannot be produced within West Yorkshire or any other established significant sources of supply into the West Yorkshire market. This issue is discussed further in section 1.6 below.

1.5. West Yorkshire Local Plans

- 1.5.1. The LAA should be one of the key pieces of evidence underlying policies relevant to the supply and safeguarding of minerals within Local Plans. All five West Yorkshire Local Authorities are independently responsible for minerals planning within their respective administrative areas.
- 1.5.2. The five West Yorkshire authorities are at different stages of plan making with Leeds, Wakefield and Bradford having up-to-date Local Plan documents relevant to minerals planning in place. Wakefield, who adopted their Local Plan/ Local Development Framework in 2009, are now seeking to review in 2018. Bradford Council's Local Plan Core Strategy, which includes minerals policies, was formally adopted by the Council in July 2017, with site allocations (including minerals) progressing.
- 1.5.3. Kirklees have submitted their Local Plan for examination in April this year, with the examination hearings scheduled to commence on Tuesday 10th October 2017 and the minerals elements of the plan scheduled for examination in November 2017. Calderdale Council has produced Local Plan Initial Draft (July 2017) which has recently been put out to consultation, with a consultation period of 4th August to 29th September 2017, but has not yet progressed to Examination. Having a robust Local Aggregates Assessment in place is a pre-requisite to achieving sound minerals planning policies and to facilitating the monitoring and updating of adopted plans.
- 1.5.4. Minerals policies within Local Plans are relevant to the Local Aggregates Assessment in so far as it should be acknowledged that identified minerals resources are unlikely to be released for extraction if Local Plan policies are in place which effectively restrict further extraction of that resource.
- 1.5.5. The only identified relevant restrictive policy is policy MINERALS 6 in the Leeds Natural Resources and Waste Local Plan adopted on 16th January 2013. This policy states that it is unlikely the Council will support proposals

for the extraction of sand and gravel in the Wharfe Valley in the area east of Pool. Therefore it is acknowledged that the sand and gravel resource mapped by the BGS within this area is unlikely to be released for extraction within the Leeds Local Plan period

1.6. Other Relevant Local Aggregate Assessments

- 1.6.1. West Yorkshire has historically been, and remains, reliant on aggregates imported from adjoining areas to fulfil its construction needs and therefore security of the supply patterns which fulfil West Yorkshire demand is a key issue relevant to the West Yorkshire LAA. This section will therefore summarise the findings of the LAAs produced by Mineral Planning Authorities supplying aggregate into West Yorkshire, as shown in Figure 9.
- 1.6.2. The two most significant LAAs, in terms of the minerals supplied into West Yorkshire, are the LAA relating to the North Yorkshire Sub-region (including the Yorkshire Dales National Park) and the LAA relevant to minerals producing authorities within the South Yorkshire area (the Doncaster and Rotherham LAA). However also of relevance are the LAAs of Derbyshire, Derby and the Peak District and the Humber Area.

North Yorkshire LAA

- 1.6.3. The Local Aggregate Assessment for the North Yorkshire Sub-region (NYLAA) covers the administrative areas of North Yorkshire County Council, City of York Council, and the Yorkshire Dales and North York Moors National Park Authorities. First published in January 2013 it has subsequently been updated through a 'First Review' document dated February 2015, with a Second Review document having been ratified by the Yorkshire and Humber AWP on 28 September 2016.
- 1.6.4. A significant proportion of the crushed rock aggregate derived from the North Yorkshire sub-region, including all the High Specification Aggregates (HSA), has historically been sourced from the Yorkshire Dales National Park (YDNP). The most recent statistics, included in the draft NYLAA Second Review document indicate that 47% of the 6 million tonnes of crushed rock aggregates produced in the North-Yorkshire sub-region in 2015 were extracted within the YDNP.
- 1.6.5. Recently released BGS data indicates that between 0.8 and 1 million tonnes of the 3.2 million tonnes of aggregate extracted within YDNP in 2014 was consumed within West Yorkshire, i.e. between 25% and 30% of YDNP's total aggregate production is exported to West Yorkshire. Therefore the importance of the continued supply of aggregate, particularly HSA, from the YDNP to West Yorkshire is clear.
- 1.6.6. The NYLAA does not include any apportionment for future aggregate provision from within the YDNP. Instead the annual apportionment figure is derived solely from the 10 year sales average associated within the North Yorkshire County Council Area, adjusted up to allow for planned housing growth.

- 1.6.7. The Yorkshire Dales National Park Local Plan (adopted December 2016) applies the national planning policy position in relation to the extraction of minerals in National Parks by restricting the development of new crushed rock quarries or the extension of existing quarries into areas of undisturbed land other than in exceptional circumstances. However the continuity of supplies from existing extraction sites is provided for by allowing extensions, in time, extraction area or depth, in disturbed land within the boundary of an existing active quarry, where specified criteria are met.
- 1.6.8. Consequently the NYLAA advises that ‘in practice the Yorkshire Dales National Park has a substantial landbank of crushed rock and is expected to be able to continue maintaining supply over the period to 2030 and beyond’. It is, therefore, not considered that the lack of provision within the NYLAA to either maintain aggregate supplies from the YDNP, or compensate for a reduction in these supplies with an equivalent increase in apportionments elsewhere within North Yorkshire, is a significant short/medium term threat to the future continuity of crushed rock aggregate supplies to West Yorkshire.
- 1.6.9. However, notwithstanding the substantial landbank of crushed rock within the Yorkshire Dales, the Minerals Products Association have advised that they believe the reserves of aggregate which would meet the definition of HSA are very limited. The NYLAA acknowledges this, stating that ‘unless new permissions are granted, there is potential for reserves of high PSV (Polished Stone Value) aggregate and Magnesian Limestone in particular to be significantly reduced in the mid-term.’ The North Yorkshire sub-region outside the YDNP is not in a position to make up any longer term shortfall in HSA, as suitable resources do not exist. Therefore, there is potentially a mid-term threat to the security of supply of HSA into West Yorkshire.
- 1.6.10. The North Yorkshire LAA also highlights potential near-term supply issues for sand and gravel, which could impact on West Yorkshire; however it is acknowledged that: ‘The potential for this may be influenced significantly by the outcome of a number of current planning applications for new sand and gravel reserves within the NYCC area. The potential substitutability of crushed rock for sand and gravel for concreting uses may help offset the effect of any reduced supply of sand and gravel. Similarly, in the medium term and beyond, marine aggregate may be able to play a greater role in offsetting the effects of any sand and gravel supply constraints in North Yorkshire.’
- 1.6.11. The NYLAA first and second review documents do not calculate landbanks based solely upon 10 year sales averages but instead adjust the sales average up based upon estimates of the increase in sand, gravel and crushed rock production which would be required to provide for planned housing growth. This approach addresses the negative impact of the economic downturn on the 10 year sales average and is intended to facilitate the return of aggregate supplies to a level where they could provide the raw materials necessary to deliver planned housing growth in the market area supplied by North Yorkshire.

1.6.12. Consequently the NYLAA second review document calculates future provision for sand and gravel at an overall annual rate equivalent to 2.44mt and an annual rate of 3.75mt for crushed rock for the period 2015 to 2030. These figures are around 28% and 17% higher respectively than those which would be derived using 10 year average sales from the North Yorkshire County Council administrative area, but exclude sales of crushed rock from the YDNP.

Doncaster and Rotherham LAA

1.6.13. An updated draft Local Aggregate Assessment (2017) has been produced for Doncaster and Rotherham (D&RLAA 2017), which, according to BGS figures, was the second largest supplier of crushed rock into West Yorkshire in 2014. The draft DRLAA 2017 proposes apportionments based on a continuation of historic sales figures. In relation to crushed rock (Magnesian Limestone) the draft LAA advises that the landbank currently stands at thirty years, with between 70 to 90% of the material produced in Doncaster staying within South Yorkshire and West Yorkshire.

1.6.14. The draft D&RLAA 2017 does not flag up any concerns regarding the supply of crushed rock in the short, medium or long term. However the draft LAA does identify that three year average sales (2.4Mt) are currently showing a trend for increased demand and that evidence continues to suggest crushed magnesian limestone is increasingly replacing sand and gravel for concrete manufacture.

1.6.15. In relation to sand and gravel, based on ten year average sales of 0.3 million tonnes, the landbank calculated in the draft DRLAA2017 stands at 29 years for 2016, which is well above the 7 year minimum set in the NPPF. The draft LAA confirms that the Doncaster landbank has increased significantly between 2015 and 2016 due to improved response rates from owner / operators. However only a small proportion of the remaining permitted reserve in Doncaster is suitable for use as concreting aggregate with about 2Mt (approximately 23%) of the landbank being sharp sand and gravel.

1.6.16. The draft DRLAA2017 assesses that, with the improved returns identifying additional reserves, the current landbank of sand and gravel within Doncaster may be sufficient to meet development proposals, other than in relation to sharp sand and gravel. Nonetheless South Yorkshire remains dependent on sand and gravel imports predominantly from Nottinghamshire, Lincolnshire and East Riding. The 2014 Annual Monitoring Survey identified the total imports into the South Yorkshire sub region at 0.76Mt, which is significantly greater than Doncaster's production. South Yorkshire will therefore continue to be dependent on these sources to deliver Local Plan proposals.

1.6.17. In terms of supplies of sand and gravel from Nottinghamshire the draft DRLAA 2017 advises that Nottinghamshire County Council withdrew its Minerals Local Plan in May 2017 and that the County Council are now reviewing the allocations methodology with a view to preparing a revised Minerals Local Plan. The draft LAA advises that it is not possible at this time to determine how this will affect the supply of minerals into South

Yorkshire from Nottinghamshire but the existing provision will remain unaffected in the short term.

1.6.18. The draft D&RLAA 2017 identifies that over half of the crushed rock sales within Doncaster are now for concreting aggregate. Therefore, whilst any flows of concreting sand and gravel from South Yorkshire to West Yorkshire are unlikely to be sustained into the future, the substantial remaining limestone reserves may play a role in meeting West Yorkshire's future demands both for concreting and non-concrete construction purposes. This issue is explored further in the recent WYCA report on the Magnesian Limestone, see section 2.4 below.

Derbyshire, Derby and Peak District National Park LAA

1.6.19. The Derbyshire, Derby and Peak District National Park LAA 2016 (DD&PDLAA 2016) identifies an estimated reserve of rock for aggregate use within Derbyshire and the Peak District, at active and inactive sites (excluding dormant sites), of over 820 million tonnes. This reserve comprises 726 million tonnes of limestone and 0.4 million tonnes of sandstone/ gritstone in Derbyshire and 92 million tonnes of limestone and 1.35 million tonnes of sandstone/ gritstone in the Peak District National Park. The LAA identifies that this quantity of reserves would be sufficient for over 85 years provision based on current production figures.

1.6.20. In terms of supply levels the DD&PDLAA 2016 calculates a 10 year sales average of crushed rock aggregate for Derbyshire and the Peak District of 9.22 million tonnes but confirms that supply levels have declined substantially over the last decade with the 3 year 2013-2015 sales average at 7.74 million tonnes. However a general upward trajectory in crushed rock aggregate production levels is evident in recent years. 38% of the crushed rock aggregate produced within Derbyshire and the Peak District is used for concrete manufacture, with 14% used as roadstone.

1.6.21. The DD&PDLAA 2016 identifies that Derbyshire and the Peak district National Park are significant net exporters of aggregate grade crushed rock to other areas, amounting to an average of around 8 million tonnes each year. The LAA further advises that Derbyshire has significant resources of hard rock compared to many other areas in the country and the affirms that it will be important, therefore, to maintain this level of supply in order to sustain and stimulate national economic growth.

1.6.22. The LAA identifies that in 2009 12% of the crushed rock aggregate produced in Derbyshire and 15% of the crushed rock aggregate produced in the Peak District was consumed in the Yorkshire and Humber Region. The more recent BGS data from 2014 set out in Table 14 of this report indicates that in 2014 approximately 140,000 tonnes of crushed rock aggregate extracted from Derbyshire was consumed in West Yorkshire, i.e. 2% of total annual quarry output for Derbyshire and the Peak District in 2014.

1.6.23. The DD&PDLAA 2016 broadly sets a future supply figure for crushed rock aggregates based on historic average sales levels; however with an adjustment intended to gradually reduce the proportion of aggregates produced within the Peak District National Park (PDNP). The PDNP has a

policy in its Core Strategy (Policy MIN1) which does not allow for further new quarries or extensions to existing quarries, in order to reduce progressively the amount and proportion of aggregate grade crushed rock that is quarried from within the Park in order to protect the nationally protected landscape.

- 1.6.24. Consequently the DDPDLAA reduces the future crushed rock aggregate provision apportionment to the PDNP by 10%, relative to the 10 year sales average, with an equivalent increase in the apportionment for the remainder of Derbyshire outside of the national park. Whilst this policy is intended to provide for a gradual reduction in the proportion of Derbyshire's aggregate which is supplied from sources within the PDNP, it is not intended to reduce the overall quantity of aggregate supplied from Derbyshire.
- 1.6.25. In relation to sand and gravel, reserves are located within Derby and Derbyshire (not in the National Park). Total sand and gravel reserves at the end of 2015 are calculated as 12.14 million tonnes with a landbank of 11.6 years at the proposed provision figure of 1.05 million tonnes per annum. An upward trajectory in sand and gravel production appears to be evident over the last few years but with supply levels over the period between 2006 and 2015 only fluctuating within the range of 800,000 tonnes annual production to 1,220,000 tonnes annual production. The analysis provided by the DD&PDLAA 2016 indicates that there is likely to be very limited potential for this level of production to increase substantially.
- 1.6.26. The DD&PDLAA 2016 confirms that 63% of the sand and gravel produced within Derby and Derbyshire is used for concrete making. The LAA calculates the 11.6 year landbank for sand and gravel based upon the 10 year sales average. The LAA identifies the potential for demand for sand and gravel to increase, primarily associated with planned housing growth and infrastructure projects. However the LAA suggests that adopting a provision figure based upon the 10 year sales average will allow for sufficient headroom to service this potential increase in demand. This is because the 3 year sales average is still 80,000 tonnes below the 10 year average used for the provision figure.

Humber Area LAA

- 1.6.27. The Humber Area Local Aggregate Assessment, published in April 2014, covers the East Riding of Yorkshire, Hull, North Lincolnshire and North-East Lincolnshire. An updated draft Humber Area Local Aggregate Assessment was sent out for consultation in July 2017 which is based upon 2015 data. The updated draft LAA 2017 continues to acknowledge that there are concerns about the long term supply of sand into South and West Yorkshire, in particular in the Doncaster and Leeds areas and that, as a result, it is likely that sand will have to be imported into these areas from other parts of the region or elsewhere. The LAA acknowledges that this could potentially have an impact on the level of sand and gravel that will need to be extracted in the Humber area, above and beyond what is already exported.
- 1.6.28. The draft Humber Area LAA 2017 confirms that the Humber area has 11 active sites that produce sand and/or gravel. Seven are located within the

East Riding of Yorkshire, whilst two are in North Lincolnshire. Two further sites in North Lincolnshire produce silica sand, primarily of non-aggregate or industrial use. Sand and gravel sales are assessed to have been steady between 2006 and 2009 at around 1 million tonnes, but fell to a low point in 2010. Since 2010 they have risen again to an average of 0.9 million tonnes between 2013 and 2015. The draft LAA advises that sand and gravel reserves (as of 31st December 2015) were 7.1 million tonnes and that, based on the average sales for the most recent ten year rolling period, the landbank would be 7.6 years.

- 1.6.29. In relation to crushed rock, the draft LAA 2017 indicates that The Humber area has 15 active sites, all of which produce either chalk or limestone. Ten are located in the East Riding of Yorkshire whilst five are situated in North Lincolnshire. Of these sites, five produce chalk for industrial (non-aggregate purposes) and one site is producing chalk for aggregate and non-aggregate purposes. Total reserves (as of 31st December 2015) were 13.39 million tonnes.
- 1.6.30. The draft Humber Area LAA 2017 confirms that sales of crushed rock were steady during the initial part of the ten year rolling period (2006 & 2007), with a decline in 2008 and 2009. Since 2009 they have increased, with very significant growth in 2014. The average aggregate sales for crushed rock for the most recent ten year rolling period (2006 to 2015) and three year rolling period (2013 to 2015) were 0.34 million tonnes per annum and 0.57 million tonnes per annum respectively. Based on 10 year average sales the crushed rock aggregate landbank is calculated at 39.4 years.
- 1.6.31. However the draft Humber Area LAA 2017 acknowledges the aggregate demand growth which would be associated with the realisation of planned housing growth within the area and the implementation of planning infrastructure projects. These issues are explored in detail in a separate minerals demand background paper produced as part of work on the East Riding and Hull Joint Minerals Local Plan.
- 1.6.32. Based upon the assessed aggregate supply and future demand evidence, the background paper suggests that, in the case of crushed rock, the annual aggregate apportionment for East Yorkshire should be based the 10 year sales average. For sand and gravel the suggested apportionment is based on annual average sales over the latest three year period, which uplifts the apportionment from the lower ten year sales average to factor in latest trends and make an allowance for an increase in house building.
- 1.6.33. An equivalent demand forecasting exercise has not yet been undertaken in respect of the north and north-east Lincolnshire Councils and therefore the LAA assumes that the annual apportionment for these Districts will be based upon the 10 year sales average for both sand and gravel and crushed rock. Consequently a total annual aggregate supply figure for the Humber Area of 0.31 million tonnes for crushed rock and 1.02 million tonnes for sand and gravel is proposed in the draft Humber Area LAA 2017. The calculated landbank of reserves based upon these figures is 6.96 years for sand and gravel and 43.19 years for crushed rock.

- 1.6.34. The draft Humber Area LAA 2017 adopts the 10 year average sales method to calculate landbanks for crushed rock but does note that, in order to plan appropriately to meet requirements of neighbouring authorities, discussions will need to take place in order to ascertain the level of demand for aggregates in aggregate consumer areas and the likely amount needed from the Humber area as well as when this supply would be needed. As an outcome of this a meeting has recently been held between Officers representing the Humber and the West Yorkshire Combined Authority where the cross boundary aggregate flows and issues associated with marine aggregates and associated infrastructure safeguarding requirements were discussed.
- 1.6.35. The draft Humber Area LAA 2017 concludes that the Humber Area land won sand and gravel landbank as of 31 December 2015 was close to the 7 year minimum required by the NPPF, with it either standing slightly above or below 7 years depending upon the apportionment methodology used. In terms of crushed rock the draft LAA concludes that there are significant permitted reserves of 13.39 million tonnes (for aggregate purposes), as of 31/12/2015. The crushed rock aggregate landbank based upon the 10 year annual average sales rate stands at 39.4 years.
- 1.6.36. In terms of potential alternative sources of aggregate supply the draft Humber Area LAA 2017 reports that during 2015, 1.32 million tonnes of construction aggregate was dredged off the Humber from a total permitted licensed tonnage of 4.7 million tonnes. Landings of material extracted took place at ports/wharves on the River Humber (25,561 tonnes), River Tees (245,860 tonnes) and River Tyne (287,018 tonnes) as well as at Blyth (Northumberland) (37,452 tonnes). The remainder was landed elsewhere. In previous years this has been mainland Europe, the Thames Estuary and the south coast.
- 1.6.37. The draft Humber Area LAA 2017 reports that the majority of landings that took place on the Humber were at the Humber Sand and Gravel facility at Alexandra Dock in Hull. In addition Stema Shipping brings imports of crushed rock aggregates from their coastal quarries in Norway, and sand from Denmark to Queen Elizabeth Dock/ King George Dock.
- 1.6.38. The draft LAA notes that existing planning policy in the Humber area broadly supports the envisaged increase in marine won aggregates, however it does not identify or safeguard present or future sites for the handling of marine aggregate. Safeguarding of the capacity for handling imported and marine aggregates at existing wharves is part of government policy in the NPPF. The draft LAA confirms that this will need to be given due consideration as part of emerging minerals planning policy in the Humber area.

1.7. National & Regional Guidelines for Aggregate Provision

- 1.7.1. The Government publishes guidelines for aggregate provision in England covering 16 year periods which are essentially intended to predict the

amount of aggregate required to be produced over a given period to allow industrial needs to continue to be met, taking account of growth factors and also of targets for the use of recycled aggregate.

- 1.7.2. The most recent of these guidelines was published in June 2009 as, National and regional guidelines for aggregates provision in England 2005-2020. The guideline aggregate production figures for the English Regions of the 2005-2020 period are as set out in the table below:

TAB1 - National and regional guidelines for aggregates provision in England 2005-2020

New Regions	Guidelines for land-won production		Assumptions		
	Land-won Sand & Gravel	Land-won Crushed Rock	Marine Sand & Gravel	Alternative Materials	Net Imports to England
South East England	195	25	121	130	31
London	18	0	72	95	12
East of England	236	8	14	117	7
East Midlands	174	500	0	110	0
West Midlands	165	82	0	100	23
South West	85	412	12	142	5
North West	52	154	15	117	55
Yorkshire & the Humber	78	212	5	133	3
North East	24	99	20	50	0
England	1028	1492	259	993	136

- 1.7.3. The national guidelines document indicates the above regional figures should be broken down further to sub-regional Mineral Planning Authority areas by regional planning bodies. However the regional planning body relevant to West Yorkshire, the Yorkshire and Humber Assembly, was dissolved in 2011 prior to an apportionment of the 2005-2020 guideline figures having been made.

- 1.7.4. The Regional Planning Body had used a simple methodology for sub-regionally apportioning the predecessors to the 2005-2020 aggregate guideline figures, based upon average sales figures for aggregates from each sub-region over the period 1997-2001, adjusted to provide for the level of output necessary to meet the regional apportionment. This apportionment method resulted in West Yorkshire being apportioned to supply 0.34 million tonnes of sand and gravel per year (7.5% of the Regional total) and 1.1 million tonnes of crushed rock aggregate per year (8% of the Regional total).

- 1.7.5. The Regional Planning Body delayed their sub-regional apportionment of the 2005-2020 guideline figures, pending a review of whether the apportionment methodology could be adjusted to provide for a more sustainable spatial distribution of aggregate extraction sites (increasing the

apportionments to West and South Yorkshire). To this end a series of three reports were published between 2004 and 2009; however the Yorkshire and Humber Assembly was dissolved before the review process could be completed and an apportionment methodology for the 2005-2020 guideline figures was never agreed.

- 1.7.6. Therefore, instead of calculating landbanks based upon an apportionment of the national and regional guideline figure, the Yorkshire and Humber Region Aggregates Working Party Annual Monitoring Report for 2009, published in 2011, opted to calculate aggregate landbanks based upon 7 year average sales figures. Due to the low level of output from West Yorkshire, average 7 year sales figures for sand and gravel from the sub-region could not be disclosed for commercial confidentiality reasons, therefore no separate landbank for West Yorkshire sand and gravel was included in the 2009 annual monitoring report.
- 1.7.7. Subsequent Annual Monitoring Reports for the Region, including the most recent draft Yorkshire and Humber AWP Annual Monitoring Report 2017, have not sought to provide any sub-regional apportionment of the Regional guideline figure whatsoever. Although no formal sub-regional apportionment of the 2005-2020 guideline figures has been undertaken, it is worth noting that regional sand and gravel supply apportionment was increased by 7% from the 2001-2016 apportionment. Whereas the 2005-2020 crushed rock apportionment figure for the Yorkshire and Humber Region represents a reduction in 4% from the 2001-2016 figure.
- 1.7.8. It should also be noted that, if the same apportionment methodology had been applied to the 2005-2020 figures had been previously used for the 2001-2016 figures, based upon historic 7 year average sales figures, the West Yorkshire apportionment for crushed rock would have been 1.22 million tonnes and the combined sand and gravel apportionment for West and South Yorkshire would have been 0.50 million tonnes. Table 2 below summarises the figures discussed above:

TAB2 – Theoretical West Yorkshire Apportionment of 2005-2020 Yorkshire & Humber Aggregate Guideline Figures, Based Upon 2008-2014 Annual Sales Averages

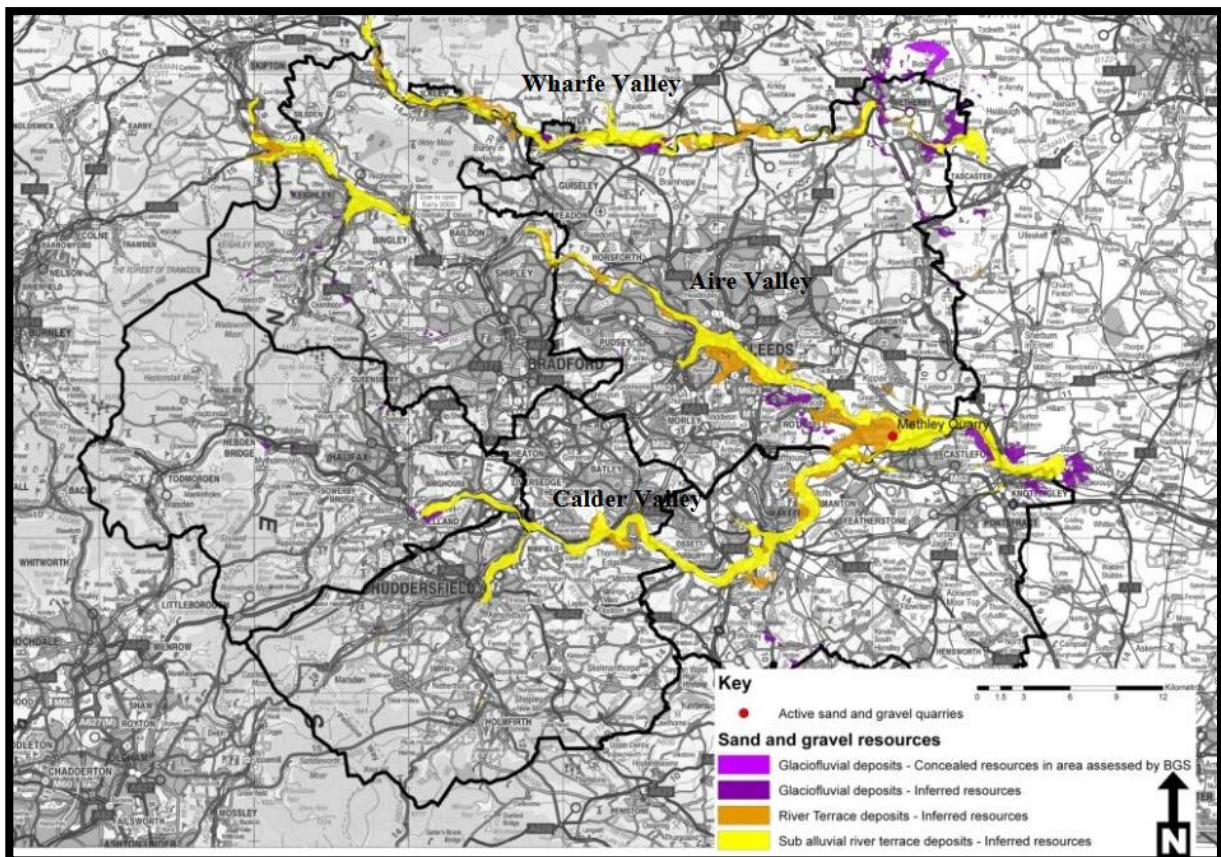
Note: All figures in millions of tonnes	Sub-regional Apportionment of 2001-2016 Regional Figure	Average Sales (2008 - 2014)	Proportion of Yorkshire and Humber Sales	Sub-regional Apportionment of 2005-2020 Figure (based on 2008-2014 sales avg)
Sand and Gravel (W & S Yorks)	1.16	0.29	10%	0.50
Crushed Rock (W Yorks Only)	1.11	0.77	9%	1.22

2. MINERAL RESOURCES

2.1. Sand and Gravel

- 2.1.1. River Terrace sand and gravel deposits are present along the river valleys of the Aire, Calder and Wharfe and some tributaries, as shown in yellow on FIG1 below. The extent and depth of deposits is variable. Only in the Wharfe is the sand and gravel suitable for making high quality concrete. The resource has been extensively worked since the 1930s and the areas are also now restrained by development and in Leeds, by the Natural Resources and Waste Development Plan Document (Local Plan) adopted in Jan 2013, which indicates through policy Minerals 6 that extraction is unlikely to be supported to the east of Pool in the Wharfe Valley.
- 2.1.2. Small localised glaciofluvial deposits are also present in many areas, as shown in purple on FIG1 below. One deposit at Oulton, Leeds, was worked dry as a borrow pit in the 1960s. There was also a small sand quarry near Boston Spa until the last decade. It is not expected that any glaciofluvial sand and gravel resources could be viably extracted.

FIG2 – West Yorkshire Sand & Gravel Resource



Source: BGS, 2009. West Yorkshire sand and gravel resources: Investigating the potential for an increased sub-regional apportionment.

- 2.1.3. As discussed in the preceding section, the Yorkshire and Humber Regional Assembly had previously considered significantly increasing West Yorkshire's sand and gravel apportionment, based upon the findings of a report which they had commissioned in 2007 by Land Use Consultants

entitled *Phase 2 Sand and Gravel Study for Yorkshire and Humber Appraisal of Apportionment Options*.

- 2.1.4. This 2007 study broadly calculated the volume of unconstrained sand and gravel resources occurring within the West Yorkshire region. The estimate was calculated using the mapped BGS sand and gravel information for West Yorkshire produced during the Phase 1 study (as shown on FIG1) which was used to calculate the total surface area for sand and gravel resources within West Yorkshire.
- 2.1.5. Resources that fell within urban areas as defined by the Office of National Statistics urban area dataset was then removed and the remaining area of unconstrained unsterilised resources was calculated. Using this area of unsterilised resources for West Yorkshire, a two-metre average resource thickness and a density of 1.75t/m³ was applied to obtain an estimate of 147 million tonnes of unsterilised resource. This was quoted as the minimum volume of resources, and if a thickness of 10m was assumed then the volume would be 735.3 million tonnes.
- 2.1.6. However it is now widely accepted that this was a very significant overestimate of the amount of sand and gravel remaining within West Yorkshire which is likely to be viable for extraction. This conclusion is supported by later BGS research in the form of the 2009 study: *West Yorkshire sand and gravel resources: Investigating the potential for an increased sub-regional apportionment*.
- 2.1.7. This 2009 BGS study was informed by a minerals industry consultation exercise and reported the following key findings:
- The industry estimate that the amount of potentially viable sand and gravel within West Yorkshire, is between 90 – 96% lower than was estimated in the phase II study.
 - Only sites containing 1-1.5 million tonnes of sand and gravel (taking up 10-25ha of land) would be likely to be economically viable. Much of the potentially viable sand and gravel resource within West Yorkshire is divided by rivers, canals, railways and roads therefore there are only likely to be a very small number of viable sites.
 - The Wharfe Valley is considered to have some of the largest areas of unworked high quality sand and gravel in the region; however the industry regard it as unviable for new extraction sites due to the proximity of landscape/ environmental designations coupled with the potential for relatively strong opposition from local communities.
 - The industry have identified 5-10 potential sites for sand and gravel extraction within West Yorkshire; however issues relating to access, environmental, hydrological, and/or planning restrictions are considered too problematic relative to the volumes and quality of reserves to merit developing any of them.

- 2.1.8. The picture of low sand and gravel West Yorkshire resource viability depicted above appears to be being borne out by the current relatively rapid contraction of the sand and gravel extraction industry within West Yorkshire, with the only extraction site which had previously remained in Leeds, at Methley, being worked out in Summer 2013 and no apparent interest in any renewed extraction in Leeds, Bradford, Wakefield or Calderdale.
- 2.1.9. West Yorkshire's remaining extraction industry is now limited to one relatively small site in the District of Kirklees. There are currently fewer productive sites than at any time since 1986 and annual output is at a recorded low.

2.2. Sandstone Aggregate

- 2.2.1. There is wide distribution of quarries producing crushed sandstone; mainly in the millstone grit series of Kirklees, Bradford and Calderdale but also in the coal measure sandstone series, notably the Thornhill Rock in Leeds. Some of the quarries are quite large such as Crosland Moor, Shepley, Bolton Woods and Howley Park, and as such can be regarded as strategically important, in terms of the availability of aggregate resources within West Yorkshire. There are no sandstone aggregate sources in Wakefield.
- 2.2.2. The sandstones are too weak and porous for the manufacture of concrete or for road building and are commonly used in low specification situations and for bulk fill. However, where investment is made in appropriate processing plant, these materials can make an important contribution and can be used to produce building sand, as well as a washed sand suitable for use in concrete products. These materials are used in large quantities in the manufacture of concrete walling and paving blocks at factories in Calderdale.
- 2.2.3. No sandstone quarry exists solely to produce aggregate; it is produced alongside the extraction of stone for the manufacture of natural stone for walling, cladding and paving. At many sites the aggregate is essentially an occasional by-product and is produced in relatively small quantities for low grade uses.

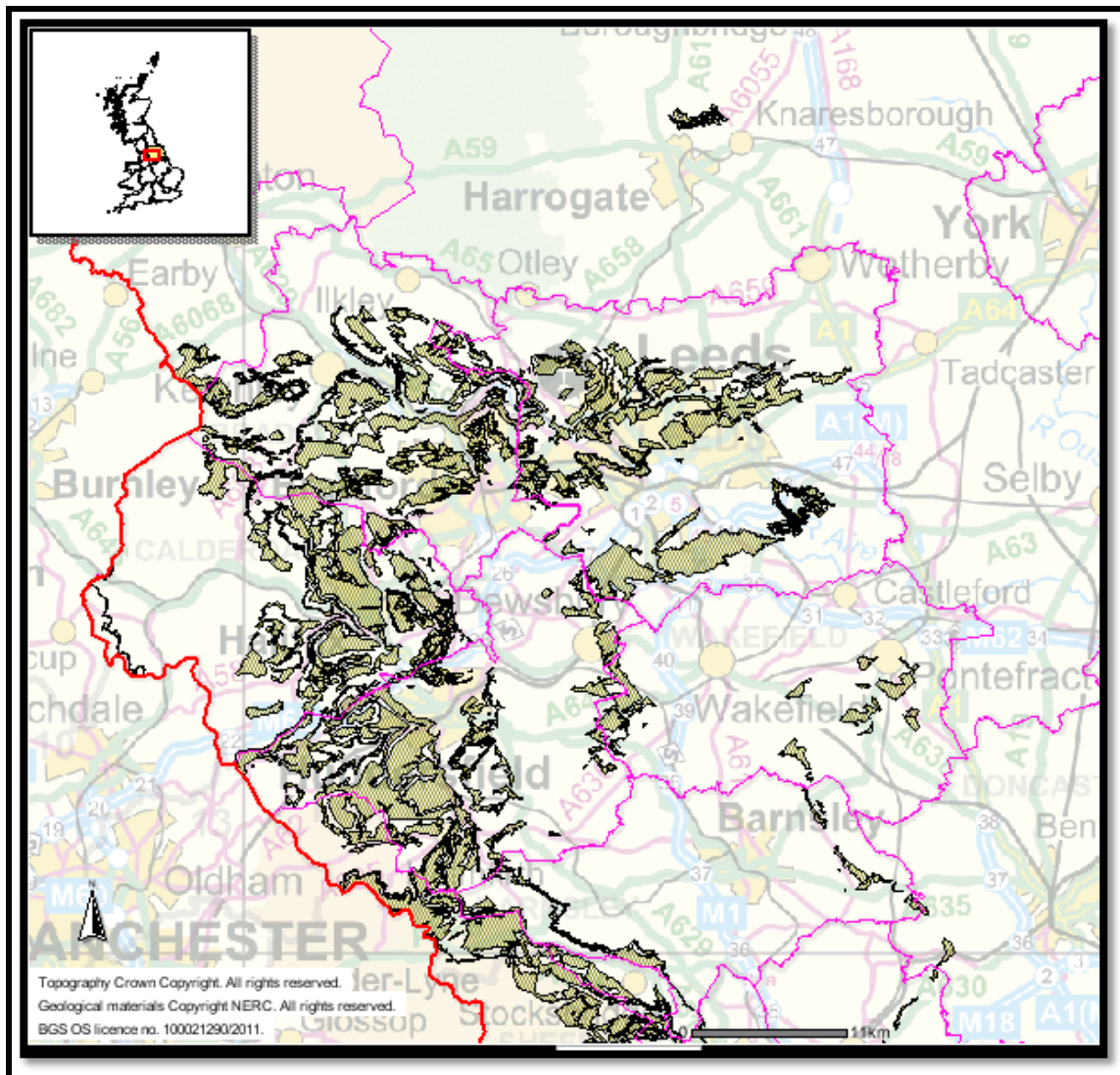
2.3. Building Sandstone

- 2.3.1. The distribution of quarries for building stone production is the same as for sandstone aggregate – in most cases they are the same. Many of the quarries are very small with a low output tonnage. Often the quarries occupy exposed locations such as Hillhouse, Elland Edge and Harden Moor. The stone is often sawn at a quarry to specific tolerances for walling, cladding and paving.

2.3.2. Much of the building stone quarried in West Yorkshire is of a high quality, particularly paving products which are of national importance, and travels widely to customers across England and into Scotland. Sandstone blocks are also traded between quarries to widen the portfolio of stone types which can be offered. Some producers of cut stone do not actually manage a quarry at all.

2.3.3. At many sites the wastage from the extraction of blocks and from sawing is crushed for aggregate/ bulk fill. Although production of crushed rock aggregates at building stone quarries is usually undertaken on an irregular basis, the annual tonnage of aggregates produced can exceed the weight of the higher value building stones. It is also notable that sandstone is crushed down to building sand at several West Yorkshire quarries, a product which can be used as a good quality alternative to sand derived from sand/ gravel pits. Many quarries have closed since 1986 and the number of active quarry sites has significantly reduced; however several of the remaining quarries have been enlarged, with their activities/ output intensifying.

FIG3 – West Yorkshire Sandstone Resource



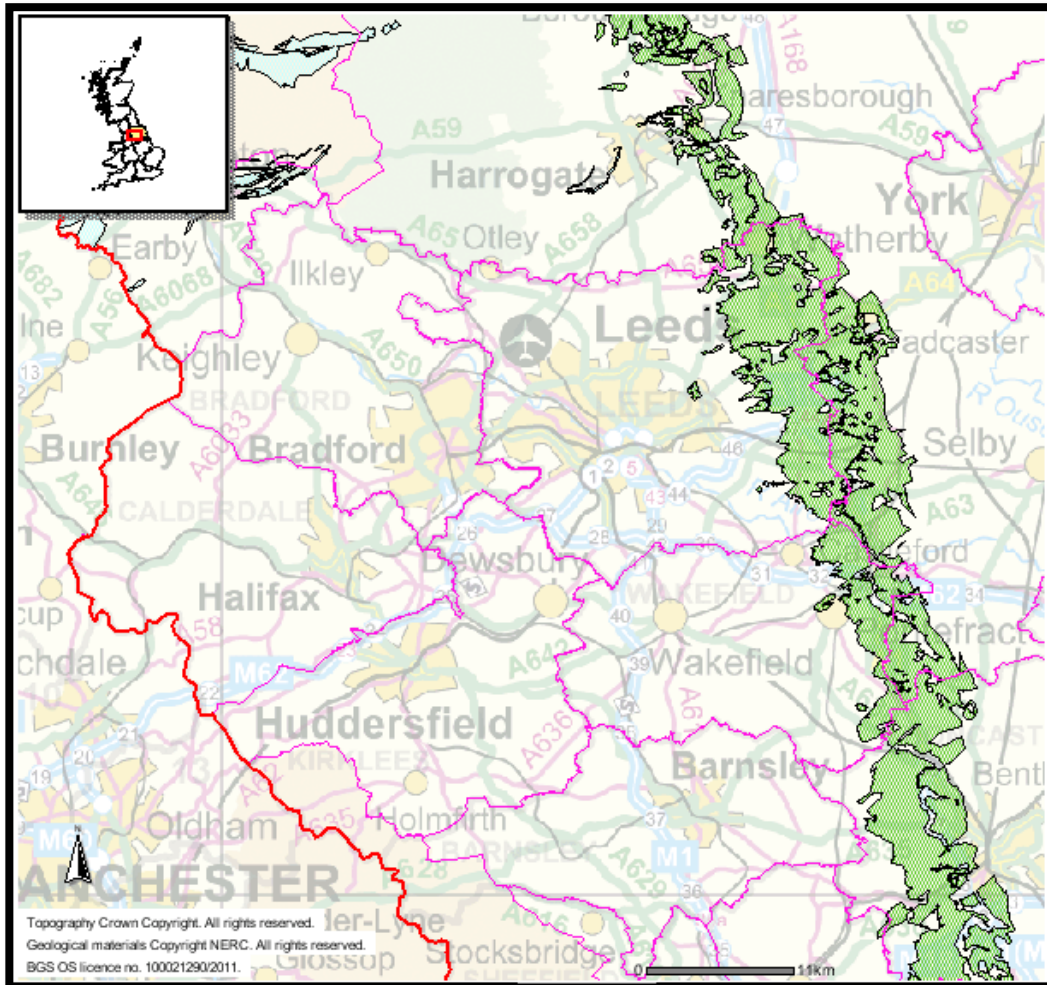
Source: BGS, 2015. Minerals Information Online
Available at: <http://www.bgs.ac.uk/mineralsuk/maps/maps.html>

2.4. Limestone Aggregate

- 2.4.1. Magnesian Limestone is the common name for a group of dolomite and dolomitic limestones running in a 200 Kilometre long, generally 8 to 12 Kilometre wide, band up the centre of northern England from Nottingham to Sunderland dating from the Permian period. The Magnesian Limestones which occur in the Yorkshire and Humber Region which comprise the Cadeby and Brotherton formations and both of these formations occur and are worked along the eastern edge of the Leeds and Wakefield Districts in West Yorkshire. These formations have historically been extensively quarried and continue to be an important source of construction aggregates, industrial minerals, building stones and agricultural lime.
- 2.4.2. Security of supply of aggregates derived from Magnesian Limestones is a particularly significant issue for South and West Yorkshire. This is because a significant proportion of the high volumes of construction aggregates consumed in the Leeds and Sheffield City Regions each year are supplied from Magnesian Limestone quarries. The BGS estimate that in 2014 50%-60% of the crushed rock aggregate consumed in South Yorkshire and 20%-30% of the crushed rock aggregate consumed in West Yorkshire was supplied from Doncaster (only Magnesian Limestone is currently worked for aggregate in Doncaster).
- 2.4.3. Magnesian Limestone aggregates are generally found to be unsuitable to produce coated roadstone (asphalt) due to its insufficient resistance to polishing, with high specification road surfacing aggregate currently primarily supplied into West Yorkshire from quarries situated within the Yorkshire Dales National Park. However approximately 40% of Magnesian Limestone quarries are thought to be capable of producing aggregates of sufficient strength to be used as a road sub-base or as a concrete aggregate.
- 2.4.4. In terms of the uses of the lower strength aggregates produced at the other 60% of quarries, these are understood to include:
- Decorative chippings
 - Bedding for permeable paving
 - Pipe Bedding
 - Capping material
 - Chippings for footpaths, driveways & flat roofs
 - Aggregate for land drainage/ filter media
 - Bulk Fill
 - Aggregate for gabion baskets
- 2.4.5. Issues associated with the supply of and demand for Magnesian Limestone Aggregates are covered more extensively in the WYCA produced 2017 report: The Quarrying of Magnesian Limestone for Aggregate in the Yorkshire and Humber Region. However in brief this report found that:
Due to the variability of the resource and the limitations of its suitability for certain high specification aggregate uses, it is

acknowledged that Magnesian Limestone aggregates will only ever supply a part of the overall market for construction aggregates. However the further exploitation of remaining Magnesian Limestone resources for aggregates is likely to be an important element of meeting the demand for aggregates into the future, with industry already reporting an increase in demand and Minerals Planning Authorities in North Yorkshire and Leeds and planning for the release of substantial additional reserves.

FIG4 – West Yorkshire Limestone Resource



Source: BGS, 2015. Minerals Information Online
Available at: <http://www.bgs.ac.uk/mineralsuk/maps/maps.html>

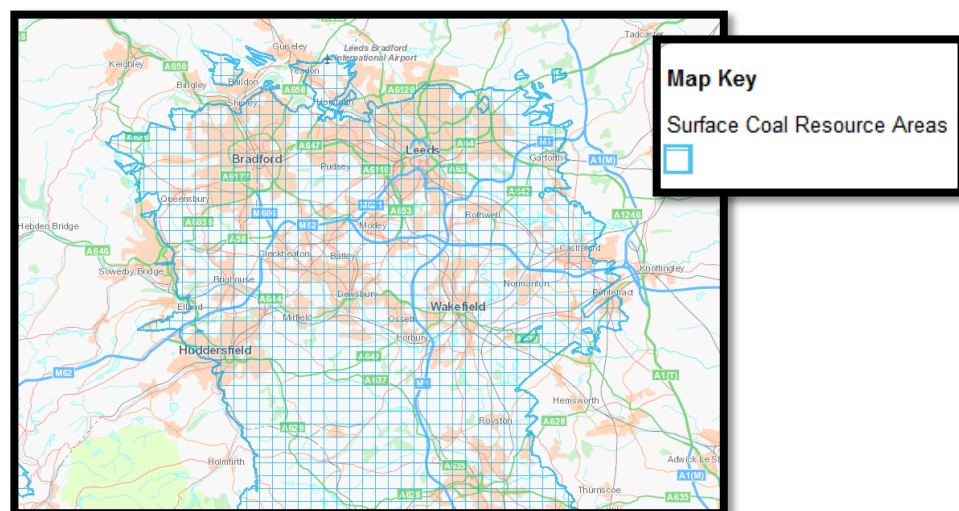
2.5. Building Limestone

2.5.1. The more uniform limestone strata has been extensively quarried on a small scale for local building stone. Currently there is one productive quarry, at Bramham in Leeds. This is a moderately sized unit supplying sawn stone across the region for construction use including elaborate carving. Interest in a further site has resulted in a Preferred Area for a new quarry in Leeds. As with sandstone this quarry is likely to produce a greater tonnage of aggregate. No quarries have opened or closed since 1986.

2.6. Coal

- 2.6.1. Deep mining: Although employing tens of thousands of miners in the past in West Yorkshire the last deep mine in West Yorkshire, Kellingley Colliery in Selby District east of Knottingley, has now closed. The small mine at Hay Royds Clayton West has now shut. The New Crofton Co-op Colliery project proposes to open a new drift coal mine just to the south of New Crofton. The mine will be owned and operated by a workers' Co-operative, New Crofton Co-op Colliery Limited. Planning permission was granted by the planning and highways committee on the 19th of June 2014. Coal mining is not a source of aggregate. Spoil can be used as bulk fill in some load bearing situations.
- 2.6.2. It should be noted that the New Crofton drift mine will not be producing until 2017 at the earliest and also that it is unlikely to produce any significant quantities of spoil, as the mining method involves backstowing of any spoil within the mine. It should also be noted that the life of the project is likely to be affected by HS2, as the site is now proposed as a carriage works. However colliery spoil sourced from spoil tips has been used historically to provide bulk fill materials for civils projects, e.g. Prince of Wales Colliery for the M62/A1 construction improvements. Some potential areas of spoil are thought to remain which would be suitable sources of fill material for major infrastructure projects.
- 2.6.3. Opencast mining: Since 1942 there has been widespread opencast coal working in all districts except Bradford and sparsely in Calderdale. The surface coalfield includes a small area of moorland west of Todmorden where there is sporadic interest. Since the mid-1990s opencast coal working has been in steep decline across the coalfield. Currently the only active coal working site is in Wakefield. Opencast coal working is not a source of aggregate.

FIG5 – West Yorkshire Coal Resource



Source: BGS/ Coal Authority, 2016. Interactive Map
Available at: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>

3. AGGREGATE RESERVES AND SALES

3.1. Sand & Gravel Reserves

- 3.1.1. Mineral resources are minerals thought to be present within given geographical areas which available geological evidence suggests may be of a quantity and quality which would be of economic interest. The sand and gravel resources within West Yorkshire of potential economic value can be found in the Calder Valley (Kirklees and Wakefield) at the confluence of the Aire and Calder (Wakefield and Leeds) and in the Wharfe valley (Leeds) There is also a small resource area with limited potential in the upper Aire valley (within Leeds) and adjacent to the river Aire in the area east of Esholt (Bradford).
- 3.1.2. Resources allocated for future extraction are minerals resources which have been identified within Local Plans as being potentially suitable for extraction within the relevant Plan Period. However release of these resources for extraction is subject to planning permission being obtained and any relevant environmental or access issues being addressed. Therefore allocated resources are not considered to constitute mineral reserves for the purposes of the LAA.
- 3.1.3. For information purposes Table 3 below indicates the extent of sand and gravel site allocations within West Yorkshire. The figure for potential total reserves is a rough estimate based upon certain broad assumptions about the extent, depth and quantity of the sand and gravel resource within the allocated sites/ areas. The release of the allocated resource for extraction would depend upon the resource being deemed to be commercially viable by the extractive industry and an environmentally acceptable development scheme being proposed.

TAB3 – West Yorkshire Sand & Gravel Allocations

Site	Type of Allocation
<i>Leeds</i>	
Midgley Farm, Otley	Allocated Site
Methley, Leeds	Extensive Area of Search
<i>Kirklees</i>	
Bradley Island (Bradley)	Area of Search
<i>Wakefield</i>	
Foxholes North of Altofts	Allocated Site
Penbank, Castleford	Allocated Site
The Wyke, Horbury	Allocated Site
Stanley Ferry, Wakefield	Allocated Site
The Strands, Horbury	Allocated Site
Potential Total Reserve	C. 7.5 Million tonnes

- 3.1.4. Mineral reserves are resources which have been granted planning permission for extraction. Certain old minerals planning permissions have been registered as dormant and therefore the reserves which these permissions cover could not be worked without further permissions being obtained.

- 3.1.5. Reserves at dormant minerals sites normally form part of the BGS standard landbank calculation methodology. However, given the low level of sand and gravel reserves and output, it is considered that the inclusion of dormant reserves would lead to the calculation of a misleadingly inflated landbank figure within West Yorkshire. Therefore reserves at dormant sand and gravel pits have not been treated as permitted reserves for the purposes of calculating the West Yorkshire sand and gravel landbank.
- 3.1.6. As of 31 December 2016 only one site remains within West Yorkshire with permitted reserves of sand and gravel. This site, located within Kirklees, began production in late 2014. The only remaining active sand and gravel extraction site located within the District of Leeds closed in July 2013 and no extraction now takes place outside of Kirklees.
- 3.1.7. The previous application to reactivate a dormant sand and gravel site within Wakefield was withdrawn some years ago. Although BGS mapping indicates that limited sand and gravel resources may remain within Calderdale and Bradford, no permitted reserves are present within either of these two Districts. The total West Yorkshire reserve of Sand and Gravel as of 31 December 2016 was 0.77 million tonnes.
- 3.1.8. Table 4 below sets out regional level sand and gravel reserves data, as presented within the draft Yorkshire and Humber Aggregate Working Party Report 2017. It is notable that total Regional sand and gravel reserves appear to have declined relatively rapidly after 2012 and in 2014 were some 20% lower than reserves in 2005. However, after 2014, Regional sand & gravel reserves have recovered well and are now at the second highest level seen for any year over the last decade.
- 3.1.9. West Yorkshire consistently provides for a relatively insignificant proportion of regional reserves, with only 2% of the 2016 Yorkshire and the Humber Sand and Gravel Reserves contained within West Yorkshire.

TAB4 – Yorkshire & Humber Sand and Gravel Reserves 2007-2016

Sub-Region	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Aggregate Sand and Gravel Sales										
North Yorkshire	20.65	20.02	18.4	17.98	16.24	19.1	18.63	16.9	19.5	20.5
South Yorkshire	10.14	10	5	5.7	5.79	5.67	5.95	2.29	4.2	8.78
West Yorkshire	-	-	0.33	0.25	0.2	0.14	0	0.88	0.99	0.77
East Riding and North Lincolnshire	-	-	14.4	9.3	11.1	9.7	8.1	7.9	7.06	7.62
Total Yorkshire and Humber	30.79	30.02	38.13	33.23	33.33	34.61	32.68	27.97	31.75	37.67

Source: Draft Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017

3.2. Sand & Gravel Sales

- 3.2.1. Sales of sand and gravel originating from West Yorkshire have steadily declined for over 20 years, consistent with the number of operating sites and their size. Sites which have closed have not been replaced. Gravel for concreting purposes is no longer produced. During 2016 only 1 sand and gravel extraction site was operational within West Yorkshire.
- 3.2.2. Table 5 below sets out regional level sand and gravel sales data, with West and South Yorkshire amalgamated for confidentiality reasons, as presented within the draft Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017.

TAB5 – Yorkshire & Humber Sand and Gravel Sales 2007-2016

Sub-Region	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Aggregate Sand and Gravel Sales										
North Yorkshire	2.7	2.3	1.7	1.6	1.7	1.6	1.5	1.7	1.7	1.7
South and West Yorkshire ¹	0.4	0.4	0.5	0.26	0.24	0.24	0.18	0.21	0.54	0.62
East Riding and North Lincolnshire	1.3	1.13	1.0	0.59	0.71	0.56	0.91	0.93	0.92	0.9
Total Yorkshire and Humber	4.4	3.83	3.2	2.45	2.65	2.4	2.59	2.83	3.16	3.22

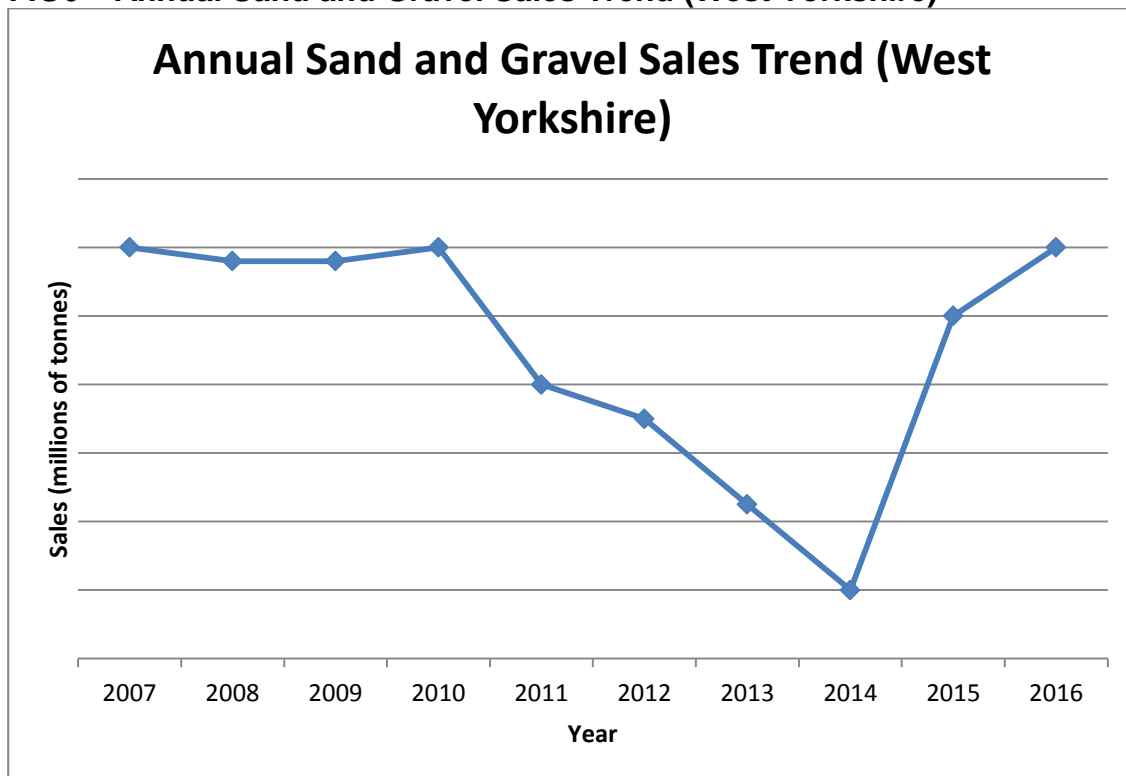
Source: Draft Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017

- 3.2.3. It is notable that West and South Yorkshire sales of Sand and Gravel comprise only 19% of the Regional Total and have now remained at a historically low level for over a decade. Furthermore total Yorkshire and Humber sales, which now appear to be on an upward trajectory following the post-recession low, have nonetheless declined by 27% between 2007 and 2016. The total annual output of sand and gravel within the Yorkshire and Humber Regional now represents only 66% of the 4.9 million tonne figure which the government estimated to be necessary to maintain adequate aggregate supplies in 2009.
- 3.2.4. The first West Yorkshire LAA, calculated a 2012 West Yorkshire sand and gravel sales figure from direct operator reporting and separated out 2004-2011 combined sales data using a % proxy. Table 6 below shows the West Yorkshire figures calculated within the first LAA and includes a 2013 figure for West Yorkshire based upon direct reporting by the relevant Planning Authorities. The 2014, 2015 and 2016 figures have been used to calculate the 10 year sales average but have been obscured within the table for commercial confidentiality reasons. Figure 6 illustrates the ten year sales trend, with the Y Axis removed for confidentiality reasons.

TAB6 – West Yorkshire Sand and Gravel Sales 2007-2016

Note: All Figures in Million Tonnes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ten Year Average
W Yorks	0.12	0.12	0.12	0.12	0.08	0.07	0.05	-	-	-	0.09

FIG6 – Annual Sand and Gravel Sales Trend (West Yorkshire)



3.2.5. Based upon the above figures a West Yorkshire 10 year annual average sand & gravel sales figure of 0.09 million tonnes can be calculated. As stated in paragraph 3.1.7 above, West Yorkshire sand and gravel reserves, as of 31 December 2016 were 0.77 million tonnes and therefore the landbank of sand and gravel within West Yorkshire, based on 10 year average sales levels, can be calculated as being:

8 years and 7 months

3.2.6. The above landbank figure represents a decrease of 2 years and 5 months from the landbank figure calculated in the West Yorkshire LAA 2016 (11 years). The decreasing landbank is due to permitted reserves being extracted and not replenished and sales continuing to increase due to higher demand. Other information relevant to setting a sand and gravel apportionment figure and deriving a more appropriate landbank is assessed in Section 4 below.

3.3. Crushed Rock Reserves

- 3.3.1. Minerals resources within West Yorkshire capable of producing crushed rock aggregates include the Carboniferous Sandstones found throughout a large proportion of West Yorkshire, but particularly prevalent in the administrative Districts of Bradford, Calderdale and Kirklees, and the Dolomitic (Magnesian) Limestones found in a strip running along the eastern boundaries of the Districts of both Leeds and Wakefield.
- 3.3.2. The characteristics of these resources are described further in Section 2 above; however it is worth reiterating that “In general, the Carboniferous sandstones in Yorkshire are too weak and porous and susceptible to frost damage for them to be used for good quality roadstone or concrete aggregate”². Nonetheless it is possible to utilise the sand which can be produced by crushing down Carboniferous Sandstones as a building and concreting sand and to produce reconstituted stone building blocks.
- 3.3.3. As of 31 December 2016 thirty-four quarries existed within West Yorkshire which either actively produce or have in the recent past produced crushed sandstone or limestone aggregates (see Appendix 1). Crushed rock aggregate is produced in all five West Yorkshire districts, sometimes in significant quantities, but more frequently in small quantities as a by-product of building stone quarrying. At some quarry sites especially in Calderdale and Bradford the amount of aggregate product is insignificant. However relatively significant quantities of crushed sandstone aggregates are incorporated into artificial stone paving and walling products. Howley Park, Shepley and Moselden quarries are also known to be major suppliers to the concrete works at Southowram.
- 3.3.4. Conversely Dolomitic Limestone, which is potentially capable of producing a higher quality concrete and road stone grade aggregate, is currently only actively produced in Wakefield, at two locations adjacent to Knottingley. At Darrington Quarry Mineral is trucked beneath the M62 to a processing plant. This aggregate is washed to remove fines, thereby achieving a higher specification for its afteruse. The total West Yorkshire reserve of Crushed Rock Aggregate as of 31 December 2016 is estimated to have been 29.82 million tonnes.
- 3.3.5. Table 7 below sets out regional level crushed rock aggregate reserve data for the 2007-2016 period. Table 8 provides the West Yorkshire reserve figures for the period 2006-2016. In terms of the degree of confidence which should be placed upon these figures it should be noted that in several instances quarry, where site operators have not provided survey returns, reserves have been estimated. There is also likely to be some variation in the accuracy of operator assessments of the proportion of reserves which are to be used for building stone vs. aggregates as this may not be apparent until the stone has been won.

² British Geological Survey, 1996. *A geological Background for Planning and Development in the City of Bradford Metropolitan District, Volume 2: A Technical Guide to Ground Conditions*. BGS: Nottingham, page 37.

TAB7 – Yorkshire & Humber Crushed Rock Reserves 2007-2016

Sub-Region	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Aggregate Crushed Rock Reserves										
North Yorkshire	225.1	220.7	210.1	204.6	202.2	191.82	189.79	185.91	178.99	170.62
South Yorkshire	60.8	58.8	63.4	62.4	61.23	60.8	59.5	57.6	56.58	52.10
West Yorkshire	40.8	40	27.14	15.74	15.44	28.5	30.4	25.7	33.74	29.82
East Riding and North Lincolnshire	-	-	1.7	5.6	10.78	10.88	12.7	12.95	13.39	13.09
Total Yorkshire and Humber	326.7	319.5	302.34	288.34	289.65	292	292.39	282.16	282.7	265.63

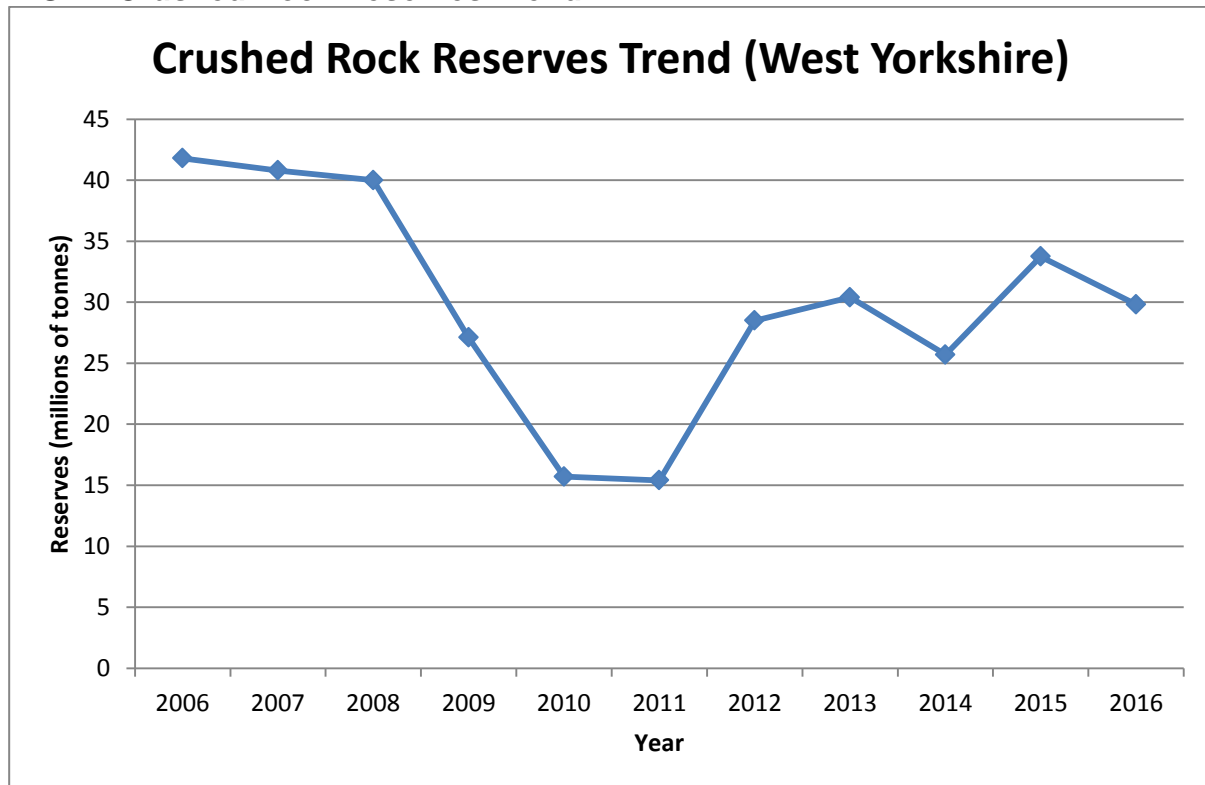
Source: Draft Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017

TAB8 – West Yorkshire Crushed Rock Reserves 2006-2016

Crushed Rock Reserves Trend (West Yorkshire)											
Note: All Figures in Million Tonnes	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
W Yorks	41.80	40.80	40.00	27.10	15.70	15.40	28.50	30.40	25.70	33.74	29.82

Note: Figures for 2006-2009 taken from RAWP Annual Monitoring Reports; figures in orange are acknowledged to be incomplete

FIG7 – Crushed Rock Reserves Trend



3.3.6. It is notable that both the Yorkshire and Humber total crushed rock aggregate reserves and the West Yorkshire reserves appear to have experienced a minor downturn in 2016 following a steady upwards trajectory from the post-recession low of 2010/ 2011. However without further data it is not possible to say whether this is likely to represent the start of another downwards trend. Part of the regional downturn appears to relate to a double counting issue, with reserves and sales for two quarries apparently attributed to two separate sub-regions over the 2013 to 2015 period. The West Yorkshire figures considered in isolation are not affected by this double counting issue.

3.3.7. It should also be noted that a substantial part of the apparent reserve decrease within West Yorkshire between 31 December 2015 and 31 December 2016 appears to relate to a Leeds Quarry operator’s significant overestimation of their reserve in 2015. It may therefore be more appropriate to look at the West Yorkshire reserve change between 2014 and 2016, which shows an upwards trajectory. It should also be borne in mind that several highly productive crushed rock quarries with large reserves dominate the totals.

3.4. Crushed Rock Sales

3.4.1. Table 9 below sets out regional level crushed rock aggregate sales data for the 2007-2016 period. Table 10 and Figure 8 provide ten year West Yorkshire sales data for the 2007-2016 period.

TAB9 – Yorkshire & Humber Crushed Rock Sales 2007-2016

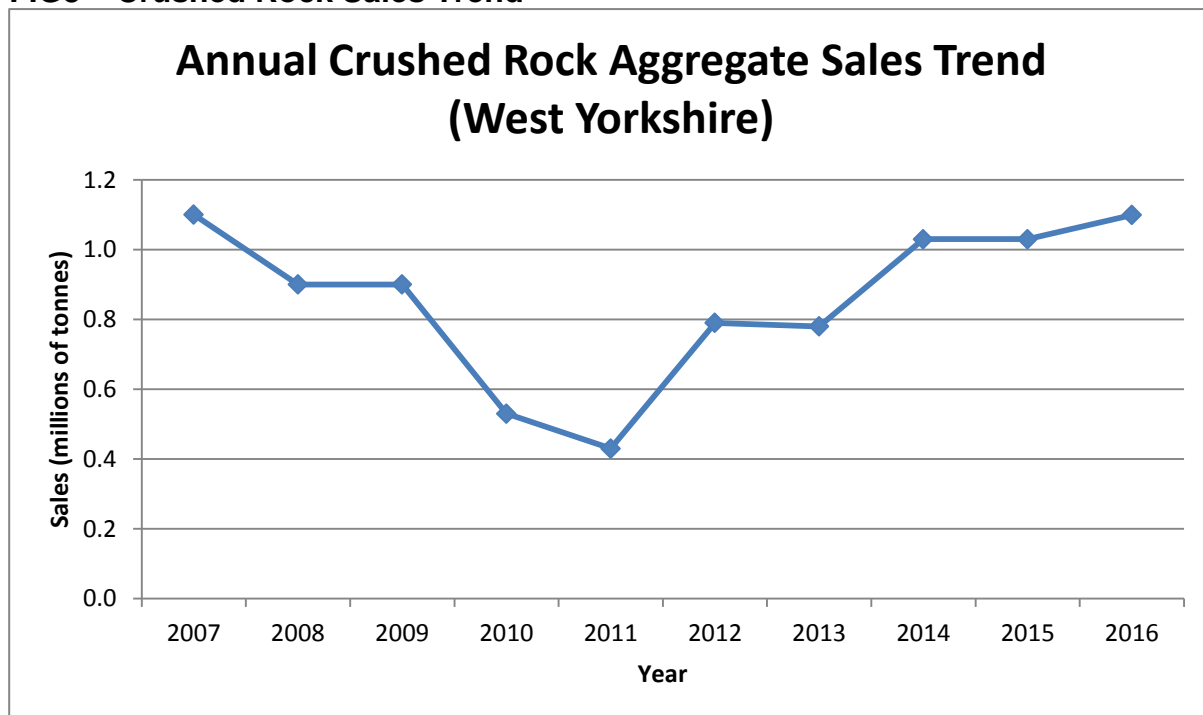
Sub-Region	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Aggregate Crushed Rock Sales										
North Yorkshire	8.3	7.7	5.3	5.51	4.45	5.33	5.65	6.49	7.04	6.67
South Yorkshire	2.3	2.2	1.4	1.1	1.05	1.14	1.27	2.25	2.4	2.6
West Yorkshire	1.1	0.9	0.9	0.53	0.43	0.79	0.78	1.03	1.03	1.10
East Riding and North Lincolnshire	0.3	0.2	0.1	0.16	0.23	0.21	0.21	0.75	0.75	0.85
Total Yorkshire and Humber	12.0	11.0	7.7	7.30	6.16	7.47	7.91	10.52	11.22	11.22

Source: Draft Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017;

TAB10 – West Yorkshire Crushed Rock Sales 2007-2016

Note: All Figures in Million Tonnes	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ten Year Average
W Yorks	1.10	0.90	0.90	0.53	0.43	0.79	0.78	1.03	1.03	1.10	0.86

FIG8 – Crushed Rock Sales Trend



3.4.2. It should be noted that, after remaining stable for a number of years at between 1.1 and 1.2 million tonnes per annum, sales of crushed rock aggregates from West Yorkshire declined relatively substantially between 2007 and 2011, before beginning to recover in 2012. The recovery of the West Yorkshire crushed rock aggregate quarrying industry appears to have continued into 2016, with sales remaining over 1 million tonnes per annum.

3.4.3. An overall significant decline in Yorkshire and Humber quarry output is also evident between 2007 and 2011. However, similarly to the West Yorkshire trend, regional quarry output has been on a generally upwards trend from its low of 2011, with a strong upward trajectory apparent between 2011 and 2015. The apparent levelling off of the upward trend in regional sales may be due to the 2013-2015 double counting issue identified in paragraph 3.3.6, above. If this double counting issue is allowed for then the upwards trend in regional crushed rock aggregate sales can be seen to have continued up to the last reserve assessment in 2016.

3.4.4. It is also worth noting that the 2016 total sales of crushed rock aggregates from the Yorkshire and Humber Region, at 11.22 million tonnes, are 12% below the 13.25 million figure which the government estimated to be necessary to maintain adequate aggregate supplies in 2009. The West Yorkshire 10 year crushed rock sales average 2007-2016 stands at 0.86 million tonnes. With reserves as of 31 December 2016 at 29.82 million tonnes the landbank of crushed rock aggregates within West Yorkshire, based on 10 year average sales levels, can therefore be calculated as being:

34 years and 8 months

- 3.4.5. This landbank figure represents a decrease of 4 years and 7 months from the landbank figure calculated in the West Yorkshire LAA 2016, which was 39 years and 3 months. This reduction can mainly be explained by an anomaly in the 2015 data returns for one of the quarries in Leeds, with the operator very substantially overestimating reserves. However, in addition to the reappraisal of Leeds' reserves the 2016 figures also indicate a substantial reduction in reserves in Calderdale, a modest reduction in reserves in Wakefield and a substantial increase in reserves in Kirklees, with the increase in Kirklees again primarily ascribed to a reappraisal exercise undertaken by a quarry operator.
- 3.4.6. The upward sales trend for aggregates in West Yorkshire is also partly responsible for the decreased landbank. As can be seen from the graph presented at Figure 17, of this report the increase in aggregate sales appears to mirror an increase in housing delivery in West Yorkshire between 2015 and 2016. Therefore the decreasing landbank could also be seen to be partly a consequence of increased construction activity associated with house building.
- 3.4.7. Notwithstanding the still very significant level of the crushed rock aggregate landbank in West Yorkshire, a substantial proportion of reserves are known to be tied up in old Building Stone quarries with low intensity/ intermittent working. Therefore parts of the apparent West Yorkshire crushed rock aggregate reserve may be unlikely to yield significant quantities of aggregate in the short/ mid-term. Other information relevant to setting an appropriate crushed rock apportionment for use in landbank calculation is assessed in Section 4 below.

4. APPRAISAL OF OTHER RELEVANT INFORMATION

In addition to appraising aggregate reserve and sales data paragraph 145 of the National Planning Policy Framework makes it clear that Local Aggregate Assessments should consider other relevant local information, and include an assessment of all supply options (including marine dredged, secondary and recycled sources) before arriving at a landbank calculation methodology.

The National and Regional Guidelines for Aggregate Provision are also relevant; however it is not expected that the pre-existing system of regional and sub-regional apportionments will simply be rolled forward.

The following section sets out the other information which the West Yorkshire Mineral Planning Authorities considers to be relevant to the assessment of the minerals supply situation within West Yorkshire. This information has been used to inform the proposed landbank calculation methodology set out in Section 5.

4.1. Aggregate Flows to and from West Yorkshire

- 4.1.1. West Yorkshire is and will continue to be a significant net importer of aggregates. This is primarily due to the simple fact that West Yorkshire accommodates 42% of the population of the Yorkshire and Humber Region within 13% of the Region's total land area. Demand for aggregates is high, the nature of the geology limited, in terms of its ability to produce certain higher specification aggregates, and the accessibility of the remaining un-worked aggregate resource constrained.
- 4.1.2. The inability of West Yorkshire to meet its own aggregate needs is evidenced by tables 11 and 12 below, which provide figures indicating the proportion of aggregate consumption which is met by imports for the four sub-regions of Yorkshire and Humber. The figures set out in these tables are taken from the BGS/ CLG document 'Collation of the results of the 2009 aggregate minerals survey for England and Wales', other than the sales figure which is taken from the tables set out in Section 3 above.
- 4.1.3. The collation of the 2014 BGS Aggregate Minerals Survey has now been published and additional figures have been provided to Local Authorities providing data on consumption and minerals flows in 2014, as analysed in Tables 13 and 14 below. TAB11 below compares AM 2009 and AM 2014 data and provides an updated assessment of the proportion of aggregate consumption which is met by imports for the 4 relevant parts of the Yorkshire and Humber Region.

TAB11 – Proportion of CR Consumption Met By Imports for Y&H Sub-regions

NB. Figures are in thousands of tonnes	Crushed Rock Sales		Crushed Rock Imports		Crushed Rock Consumption		% of Consumption Met by Imports		% Change 2009 to 2014
	2009	2014	2009	2014	2009	2014	2009	2014	
Humber (East Riding, North Lincolnshire and North East)	100	750	592	700	789	724	75%	97%	+22%
North Yorks, Yorkshire Dales and North York Moors National Parks	5,300	6,490	470	526	2,322	2,801	20%	19%	-1%
South Yorkshire	1,400	2,250	1,068	971	2,106	2,124	51%	46%	-5%
West Yorkshire	900	1,030	1,860	1,997	2,332	2,536	80%	79%	-1%

TAB12 – Proportion of S&G Consumption Met By Imports for Y&H Sub-regions

NB. Figures are in thousands of tonnes	Sand & Gravel Sales		Sand & Gravel Imports		Sand & Gravel Consumption		% of Consumption Met by Imports		% Change 2009 to 2014
	2009	2014	2009	2014	2009	2014	2009	2014	
Humber (East Riding, North Lincolnshire and North East)	1,000	930	287	305	743	424	39%	72%	+33%
North Yorks, Yorkshire Dales and North York Moors National Parks	1,700	1,700	179	207	809	1,116	22%	19%	-3%
South Yorkshire	500	210	415	751	719	760	58%	99%	+41%
West Yorkshire			764	685	810	702	94%	98%	+4%

- 4.1.4. The consumption figures included in the above tables are calculated using sales by destination data, including sales within the home region, imports from other regions and imports from outside England and Wales. It should be noted that the report cautions that the figure for total consumption slightly underestimates true consumption because for some regions unallocated sales have an unknown destination. Furthermore consumption figures are calculated from the principal destination of aggregate flows. Final sales, particularly for rail-borne aggregates, may be to other regions
- 4.1.5. However it is considered that the quality of the data is sufficient to draw broad conclusions about the relative reliance of the different parts of the Yorkshire and Humber Region upon aggregate imports and how this has changed between 2009 and 2014. The data broadly shows that all sub-areas of the Yorkshire and Humber Region are heavily reliant on aggregate imports to meet demand for primary aggregates, except for North Yorkshire.
- 4.1.6. The substantial increase in the reliance of the Humber Area and South Yorkshire on imports of sand and gravel between 2009 and 2014 is also considered to be significant, as is the fact that both south and west Yorkshire are now almost 100% reliant on imports of sand and gravel from neighbouring authorities. Although some decrease in the reliance of North, South and West Yorkshire upon crushed rock aggregate imports between 2009 and 2014 is indicated by the data, this reduction is relatively small and it is clear that West and East Yorkshire/ The Humber Area remain substantially reliant on crushed rock imports to meet demand. The reliance of the Humber Area on crushed rock imports appears to have increased substantially between 2009 and 2014.
- 4.1.7. Conversely, as described in more detail in the subsequent section, the scale of urban development present within West Yorkshire means that it has very substantial recycled and secondary aggregate (RSA) resources. Discussions with a selection of RSA producers indicate that most RSA produced within West Yorkshire is also consumed within West Yorkshire. They range from one producer stating that 50% is sent out of the county to another producing stating that all RSA which they produce is thought to be consumed locally.
- 4.1.8. West Yorkshire appears therefore to have some significance as an RSA exporter counterbalancing to a degree the imports of primary aggregate. However, there is no available reliable data on the spatial distribution of flows of RSA between regions/ sub-regions, and therefore the precise trade balance between primary aggregate and RSA imports/ exports cannot be quantified.
- 4.1.9. In terms of the sources of the aggregate imported into West Yorkshire to meet its needs, available data is not comprehensive; however recent figures released by the British Geological Survey informed by their National Aggregate Minerals Survey 2014 are set out in tables 13 and 14 overleaf.

TAB13 – Estimated Origins of Sand & Gravel Supplied Into West Yorkshire

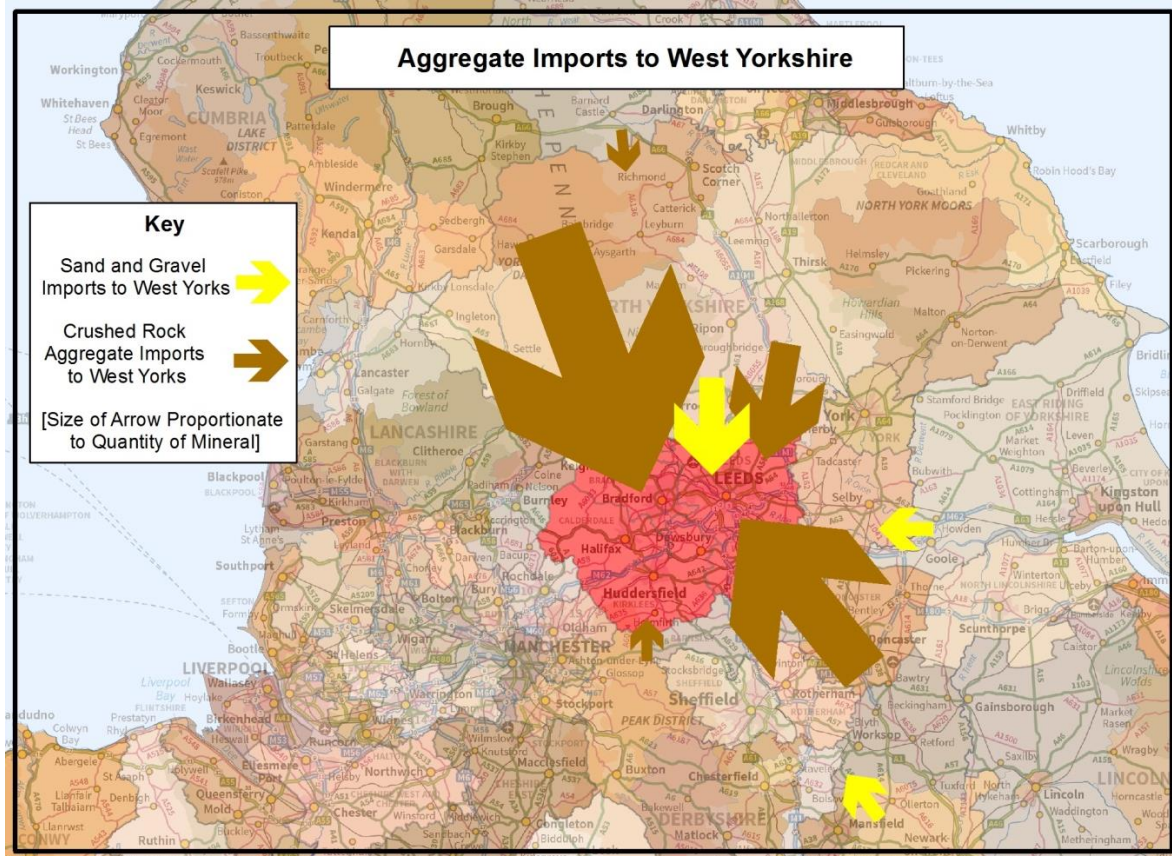
Note: All figures in Tonnes	Estimated Exports of Sand & Gravel to West Yorkshire 2009	Estimated Exports of Sand & Gravel to West Yorkshire 2014	Change	BGS Estimated Exports of Sand & Gravel to West Yorkshire 2014	
				Lower	Upper
North Yorkshire County Council	240,000	315,900	75,900	280,800	351,000
East Yorkshire	150,000	175,500	25,500	140,400	210,600
East Midlands (Nottinghamshire)	3,880	105,300	101,420	70,200	140,400
East Midlands (Lincolnshire)		38,610	38,610	7,020	70,200
North-East (Durham)		38,610	38,610	7,020	70,200
North-West (Chesh West/ Chesh East)	69,510	38,610	-30,900	7,020	70,200
West Midlands (Staffordshire)		38,610	38,610	7,020	70,200
South Yorkshire (Doncaster)	73,220	3,861	-69,359	702	7,020
Total W Yorks Consumption	810,000	702,000	-108,000	702,000	

TAB14 – Estimated Origins of Crushed Rock Supplied Into West Yorkshire

Note: All figures in Tonnes	Estimated Exports of Crushed Rock to West Yorkshire 2009	Estimated Exports of Crushed Rock to West Yorkshire 2014	Change	BGS Estimated Exports of Crushed Rock to West Yorkshire 2014	
				Lower	Upper
Yorkshire Dales National Park	453,250	887,600	434,350	760,800	1,014,400
South Yorkshire (Doncaster)	141,020	634,000	492,980	507,200	760,800
North Yorkshire County Council	250,000	380,400	130,400	253,600	507,200
East Midlands (Derbyshire)	478,384	139,480	-338,904	25,360	253,600
North-East (Durham)		139,480	139,480	25,360	253,600
North-West	79,161	13,948	-65,213	2,536	25,360
Total W Yorks Consumption	2,332,000	2,536,000	204,000	2,536,000	

4.1.10. Figure 9 below illustrates this estimated spatial distribution of aggregates flows into West Yorkshire, with the size of the arrow indicating the relative quantity of aggregate estimated to flow from the producing area.

FIG9 – Flow Map Illustrating Aggregate Imports to West Yorkshire



4.1.11. The above information illustrates the almost complete reliance of West Yorkshire on the continued supply of aggregates produced outside of West Yorkshire to meet the needs of its dense urban population in terms of construction and other industrial uses. The Yorkshire Dales National Park and Doncaster are acknowledged to be the most important suppliers of crushed rock aggregates into West Yorkshire, with lesser, but still significant, quantities supplied from the North Yorkshire County Council administrative area and Derbyshire and the Peak District.

4.1.12. In relation to Sand and Gravel, the North Yorkshire County administrative area is highlighted as the key supplier into West Yorkshire, with significant quantities of sand and gravel also thought to be transported into West Yorkshire from East Yorkshire and Nottinghamshire. The publication of the BGS AM2014 data allows some comparative analysis to be made between minerals flows into West Yorkshire in 2009 and 2014.

4.1.13. This comparative analysis indicates that there may have been a substantial increase in the dependence of West Yorkshire on crushed rock aggregate derived from the Yorkshire Dales National Park and from Doncaster in South Yorkshire between 2009 and 2014. The analysis also indicates that the quantity of aggregate imported to West Yorkshire from Derbyshire and the Peak District is significantly lower than was previously assumed.

4.1.14. However there are significant differences between the methodologies used to calculate the minerals flows into West Yorkshire for 2009 and 2014

and therefore caution should be exercised in terms of coming to any definite conclusions about any real world shifts in minerals supply patterns between 2009 and 2014 based upon these data.

- 4.1.15. Nonetheless, as discussed further in following sections, it is clear, that planning for continuity in the supply of the aggregates consumed in West Yorkshire is far more dependent upon effectively cooperating with neighbouring authorities than managing aggregate supplies within West Yorkshire itself. It is also clear that the future of aggregate extraction within the Yorkshire Dales National Park is of key strategic economic importance to West Yorkshire.

4.2. Recycled and Secondary Aggregates (RSA)

- 4.2.1. A large proportion of West Yorkshire is covered by urban development which comprises a rich potential source of recycled aggregates arising from the demolition of buildings, clearance of sites and construction of new developments.
- 4.2.2. Sources of secondary aggregates are much more limited with the only power station producing pulverised fuel ash (pfa), Ferrybridge Power Station, now closed, albeit with a smaller new 68 MW multi-fuel power station continuing to operate at the site. Several other multi-fuel or energy from waste power plants also operate within West Yorkshire which are also a potentially significant source of bottom ash derived secondary aggregate.
- 4.2.3. Very little aggregate derived from mineral waste has been generated in West Yorkshire for many years. Materials such as metallurgical slags, burnt colliery spoil, power station waste and other furnace ash has largely been produced outside of the area. Small amounts of red shale occasionally enter the market, such as a quantity from Sharlston, Wakefield in 2008. Unburned spoil from Prince of Wales Colliery has been used as bulk fill but this is not viewed as an aggregate
- 4.2.4. Prince of Wales Colliery spoil tip site and some other unrestored sites within Wakefield represent a potential source of supply of secondary aggregate. However the viability of exploiting this source is not currently apparent, potentially due to a lack of demand in terms of large civil contracts requiring significant quantities of bulk fill. Market interest in colliery spoil exploitation may be more likely to be shown in the current spoil tip locations in nearby North Yorkshire associated with the now closed Kellingley colliery.
- 4.2.5. Paragraph 143 of the National Planning Policy Framework advises planning authorities to, so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials. Paragraph 145 goes on to confirm that Local Aggregates Assessments should be based upon an assessment of all supply options (including secondary and recycled sources). WRAP defines recycled and secondary Aggregates (RSA) as follows:

- 4.2.6. Recycled Aggregates: derived from reprocessing materials previously used in construction. Examples include recycled concrete from construction and demolition waste material and railway ballast.
- 4.2.7. Secondary Aggregates: usually by-products of other industrial processes not previously used in construction. Secondary aggregates can be further sub-divided into manufactured and natural, depending on their source. Examples of manufactured secondary aggregates are pulverised fuel ash (PFA) and metallurgical slags. Natural secondary aggregates include china clay sand and slate aggregate (neither of these are produced in the region). RSA can include the following materials:

FIG10 – Types of Recycled and Secondary Aggregate

Recycled	Secondary	
	Manufactured	Natural
Recycled aggregate (RA)	Blast furnace slag	Slate aggregate
Recycled concrete aggregate (RCA)	Steel slag	China clay sand
Recycled asphalt	Pulverized-fuel ash (PFA)	Colliery spoil
Recycled asphalt planings (RAP)	Incinerator bottom ash (IBA)	
Spent rail ballast	Furnace bottom ash (FBA)	
	Used foundry sand	
	Spent oil shale	
	Recycled glass	
	Recycled plastic	
	Recycled tyres	

Source: WRAP, 2013, Available online at: http://aggregain.wrap.org.uk/more_information.html

- 4.2.8. Recycled Aggregate is primarily produced from construction, demolition and excavation (C,D&E) waste. The Environment Agency Data Interrogator 2015 shows a total of 2,051,695 tonnes of CD&E waste deposited at permitted waste management sites and originating in West Yorkshire consisting of 571,145 tonnes of construction &demolition waste and 1,480,248 tonnes of excavation waste.
- 4.2.9. Most CD&E waste originating from West Yorkshire is managed within West Yorkshire whilst "exports" were only significant to adjacent authorities within the Yorkshire and Humberside region. Exported CD&E waste accounted for less than 10% of estimated arisings and 92% of these exports remained within the Yorkshire and Humberside region.

4.2.10. Whilst over 90% of CD&E waste is managed within the sub region there is a significant transfer of this waste between the individual West Yorkshire Authorities due to the location of landfill and processing plant within different authorities. Table 15 below therefore distributes the arisings of CD&E waste by population distribution. This table and the associated pie charts have been extracted from the draft West Yorkshire Combined Authority Waste Needs Assessment Capacity Gap.

TAB 15 – Estimated CD&E arisings for West Yorkshire distributed by population (tonnes)

Authority	C&D Landfill	C&D Recycling	Excavation Landfill	Excavation Recycling
Bradford City	26,162	106,868	287,669	56,928
Calderdale	10,265	41,929	112,864	22,335
Kirklees	21,392	87,382	235,215	46,548
Leeds	38,125	155,735	419,207	82,958
Wakefield	16,439	67,150	180,754	35,770
Totals	112,384	459,063	1,235,709	244,539
WYCA	Total C&D Arisings 571,447		Total Excavation Arisings 1,480,248	

FIG11 – C&D arisings for West Yorkshire by management route (2015)

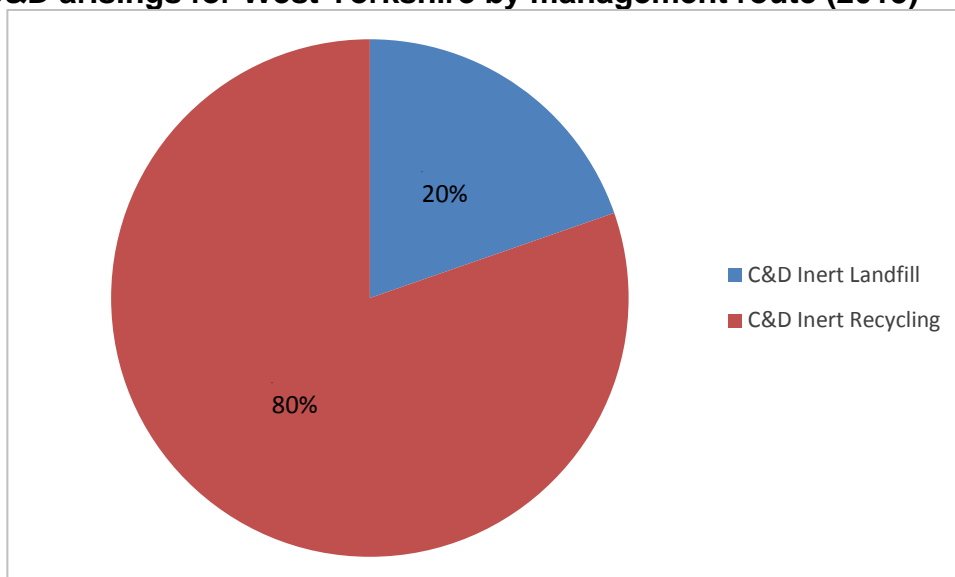
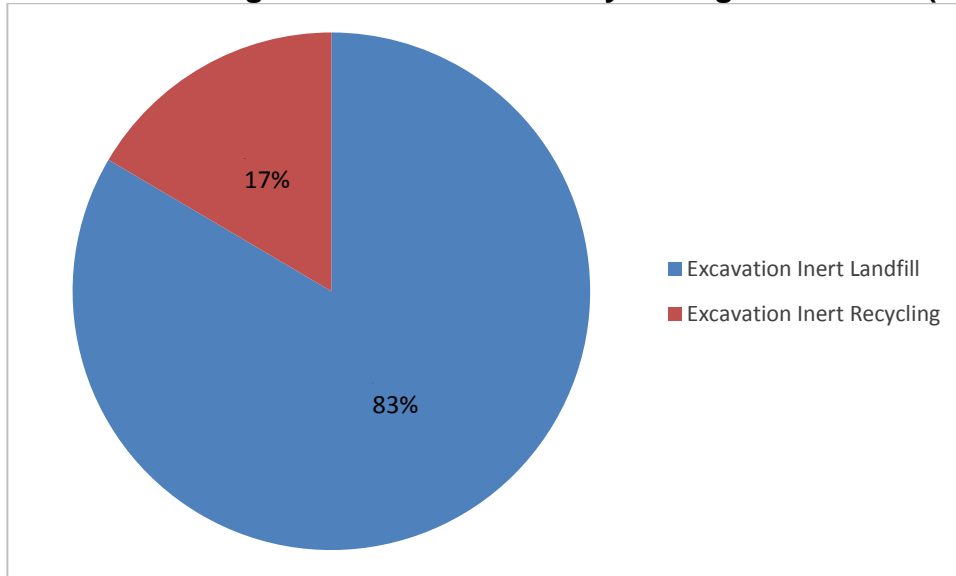


FIG12 – Excavation arisings for West Yorkshire by management route (2015)



4.2.11. The figures set out in table 15 do not represent the total quantity of construction and demolition wastes produced in West Yorkshire, but rather the total quantities of such waste received at permitted facilities – i.e. sites where there is a permit in place issued by the Environment Agency. The figures therefore neither give an indication of the total quantity of the potential RSA resource nor the proportion of this resource which is actually used as RSA.

4.2.12. To attempt to understand better the fate of construction and demolition wastes treated within West Yorkshire the table below breaks down the figures into the type of facility where the waste was received. As can be seen 80% of the recorded construction and demolition waste was recycled, the majority of which will have been used to produce Recycled Aggregate. The reverse is true in relation to excavation waste, with over 80% of this material consigned to landfill.

TAB16 – Management of Construction and Demolition Waste W Yorks 2015

Facility Type	Tonnes Received	% of Total
C&D Landfill	112,384	20%
C&D Recycling	459,063	80%
C&D Total	571,447	
Excavation Landfill	1,235,709	83%
Excavation Recycling	244,539	17%
Excavation Waste Total	1,480,248	

4.2.13. Various studies have been carried out in an attempt to understand the quantity of waste with the potential to produce RSA which is generated and the proportion of this waste which is currently being recycled/ reused as RSA.

4.2.14. The most up-to-date authoritative study which broke down figures to a sub-regional level is the government commissioned Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005. This study estimated that 3,463,198 tonnes of construction, demolition and excavation (CDEW) waste was generated within West Yorkshire in 2005 of which 1,807,458 tonnes (52%) was used to produce recycled aggregates, see table 17 below:

TAB17 – Regional Estimate of CDEW Arisings

Table A11.7: Regional estimates of CDEW recycled by crushers and/or screens, used/disposed of at landfills, and spread on Paragraph 9A(1) and 19A(2) registered exempt sites in 2005 (tonnes)				
English Region and Sub-Region	Yorkshire & the Humber: West Yorkshire			
Adjusted estimate of population of recycling crushers	30			
Estimated production of recycled graded aggregate (tonnes)	1,235,946			
Estimated production of recycled ungraded aggregate (tonnes)	571,512			
Estimated production of recycled soil (excl. topsoil) (tonnes)	234,408			
Estimated tonnage of unprocessed CDEW entering licensed landfills, and its use / fate				
	Engineering	Capping	Waste	Total
Clean hard C&D waste	53,386	0	60,714	114,100
Contaminated hard C&D waste	300	0	2,802	3,102
Clean excavation waste	96,087	284,691	327,784	708,562
Contaminated excavation waste	28,191	0	92,545	120,736
Clean 'mixed' CDEW	13,271	661	116,204	130,137
Contaminated 'mixed' CDEW	48	0	16,718	16,766
Other	91,529	0	46,577	138,106
Total	282,812	285,353	663,344	1,231,508
Estimated weight of waste materials (mainly excavation waste) used on Paragraph 9A(1) and 19A(2) registered exempt sites (tonnes)	189,824			
Total estimated arisings of CDEW in 2005 (tonnes)	3,463,198			

Source: CLG, 2007. Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005

4.2.15. Additionally the 2005 survey estimated that 420,000 tonnes of pulverised fuel ash, 90,000 tonnes of furnace bottom ash, 30,000 tonnes of incinerator bottom ash, and 50,000 tonnes of glass container waste were generated within West Yorkshire in 2005; a total of an additional 590,000 tonnes of potential secondary aggregate material of which it was estimated that 150,000 tonnes was actually used to produce aggregates.

4.2.16. A more recent study, Construction, demolition and excavation waste arisings, use and disposal for England 2008, was undertaken by WRAP to assess the extent to which Construction and Demolition Waste Arisings had changed between 2005 and 2008. The study found that arisings of inert CDEW had fallen by 7% over the 3 year period but that the proportion of this material which was used to produce aggregates had increased nationally from 47% to 52%, see table 18 overleaf:

TAB18 – Comparison of 2005 & 2008 CDEW Data

	2005	2008	Change
'Hard inert' CDEW generating recycled aggregate	42.07	43.52	+3%
Inert CDEW recovered as recycled soils	4.36	9.21	+111%
Waste (mainly excavation waste) spread on exempt sites	15.44	10.98	-29%
Mainly inert CDEW beneficially used for landfill engineering / capping	9.61	10.60	-47%
Mainly inert CDEW beneficially used to restore former quarries	10.24		
Other largely inert CDEW deposited at landfills as waste	7.90	8.93	+13%
Sub-total (largely inert CDEW)	89.63	83.24	-7%
of which deposited at permitted landfills	27.75	19.53	-30%
Non-inert CDEW deposited at permitted landfills as waste	Not estimated	2.87	n/a
Non-inert CDEW sent for external recovery	Not estimated	0.82	n/a
Total (all lines)	n/a	86.93	n/a

Source: WRAP, 2010. Construction, demolition and excavation waste arisings, use and disposal for England 2008

4.2.17. If the changes to the national figures found in the WRAP 2008 report are applied to the West Yorkshire figures from the CLG 2005 report we can crudely estimate the West Yorkshire figures for 2008 as being 2,011,682 tonnes of RSA produced from a potential waste resource of approximately 3,810,774 tonnes.

TAB19 – West Yorkshire Estimate of CDEW Arisings 2005 & 2008

	2005	2008
Arisings of Inert CDEW	3,463,198 t	3,220,774 t
Quantity of RA Produced from Inert CDEW	1,807,458 t	1,861,682 t
Quantity of Potential Secondary Aggregate Material	590,000 t	
Quantity of SA Produced from Secondary Aggregate Material	150,000 t	
Total Potential RSA Making Resource	4,053,198 t	3,810,774 t
Total RSA Produced	1,957,458 t (48%)	2,011,682 t (53%)

4.2.18. To gain a more accurate understanding of RSA production in west Yorkshire in recent years RSA producers have been included in the annual aggregate survey. Upon the basis of returns from this survey, combined with MPA estimates where appropriate, the figures set out in table 20 below can be derived. Please note that the figure for Wakefield is an estimate based upon 25% of the total figures for Leeds, Bradford and Calderdale, with Kirklees reporting that no RSA is produced within the District.:

TAB20 – West Yorkshire Local Authority Estimates of RSA Production

Planning Authority	Estimated RSA Production Total 2015
Leeds CC	380,000 tonnes
Bradford	320,000 tonnes
Calderdale	90,000 tonnes
Wakefield	200,000
Kirklees	No RSA produced
Total	980,000

4.2.19. The approximately 1 million tonnes of RSA estimated to have been produced in West Yorkshire in 2015 represents a significant contribution to meeting the total demand for construction aggregates. The figure is lower than in previous WY LAAs, as a different, more accurate methodology has been used. Although still a substantial amount of RSA, it should be born in mind that the quality and characteristics of RSA varies widely. Some higher quality recycled aggregate products are now emerging, for example crushed concrete only, which can be re-incorporated as a percentage of new ready mix concrete.

4.2.20. Similarly some highway planings are being reincorporated into new asphalt. One operator now claims a blend of recycled aggregate equivalent to carboniferous limestone hard core which can be successfully used in areas of paving and some load bearing reinstatements. It is likely to remain the case that a high proportion of the RSA aggregate produced is not suitable for high specification uses.

4.2.21. The national and regional guidelines for aggregates provision in England 2005-2020 made an assumption that 133 mt of the total of 431 mt of construction aggregates which would be needed in the Yorkshire and Humber Region between 2005 and 2020 would be made up by RSA (31%). Based on these figures the estimated annual level of RSA production in West Yorkshire in 2015 (980,000 tonnes) makes up approximately 12% of the total estimated 8,312,500 tonne annual need for RSA in the Yorkshire and Humber Region.

4.2.22. In terms of the safeguarding of resources it should be noted that the Leeds Natural Resources and Waste Local Plan safeguards all but one recycled aggregate site within the District. The plan also allocates a large new site to compensate for the eventual loss of a non-safeguarded site.

4.2.23. The emerging Bradford Waste Management DPD also safeguards aggregate recycling sites under draft policy WDM3, as does the emerging Calderdale Local Plan under draft policy WA3 and the submitted Kirklees Local Plan under draft policy PLP 45. The adopted Wakefield Local Development Framework does not safeguard aggregate recycling facilities.

4.3. Mineral use in aggregate

- 4.3.1. Although aggregate minerals are used in a way which changes little between one year and the next, evolution of use nevertheless does take place. An example of this can be seen in the way that recycled aggregate had made an appreciable inroad into the sales of low quality virgin aggregate. Product refinement has also begun to allow recycled aggregates to be substituted for a limited proportion of higher quality virgin aggregates in ready mix concrete and asphalt.
- 4.3.2. Furthermore, in concrete making, the gravel component can be replaced by crushed rock but this requires a greater proportion of cement to be used in the mix. Sand for asphalt differs from sand for concrete. Currently good concreting sand is not over abundant, so that some effort is being expended by the industry in making a sand from limestone grit or from crushed sandstone. It is also known that marine sand makes an excellent concreting sand and, moreover, can reduce the quantity of cement needed to make concrete of the same performance.
- 4.3.3. Many of these alternatives are technically comparable but production and transport costs vary greatly depending on which source is used. Where traditional locally sourced sand and gravel has been freely available it has generally been the preferred aggregate specified by industry and customers. Nevertheless, if traditional local sources are not available, then these alternatives are viable.
- 4.3.4. Nonetheless, the relative increase in crushed rock aggregate consumption in West Yorkshire, and commensurate decrease in Sand and Gravel consumption, between 2009 and 2014 indicated by recent BGS data appears to support the suggestion that substitution of sand and gravel for crushed rock in concrete making may be increasingly taking place.
- 4.3.5. Crushed Dolomitic Limestone is one of the key aggregates capable of being used in concrete manufacture. The recent report on The Quarrying of Magnesian Limestone for Aggregate in the Yorkshire and Humber Region (2017) produced by WYCA identifies that substantial reserves of Magnesian Limestones potentially suitable for concrete manufacture exist within North and South Yorkshire and Derbyshire.
- 4.3.6. It is recognised that Magnesian Limestone will only ever supply part of the construction aggregate market, with a significant proportion of the resource only suitable for lower specification uses. However the importance of this resource as a potential substitute concreting aggregate should not be overlooked. Further exploitation of this resource may comprise part of the

strategy to compensate for anticipated constraints on the supply of other land won aggregates, such as sand and gravel, in the future.

4.4. Potential Role of Marine Aggregate (Sand and Gravel)

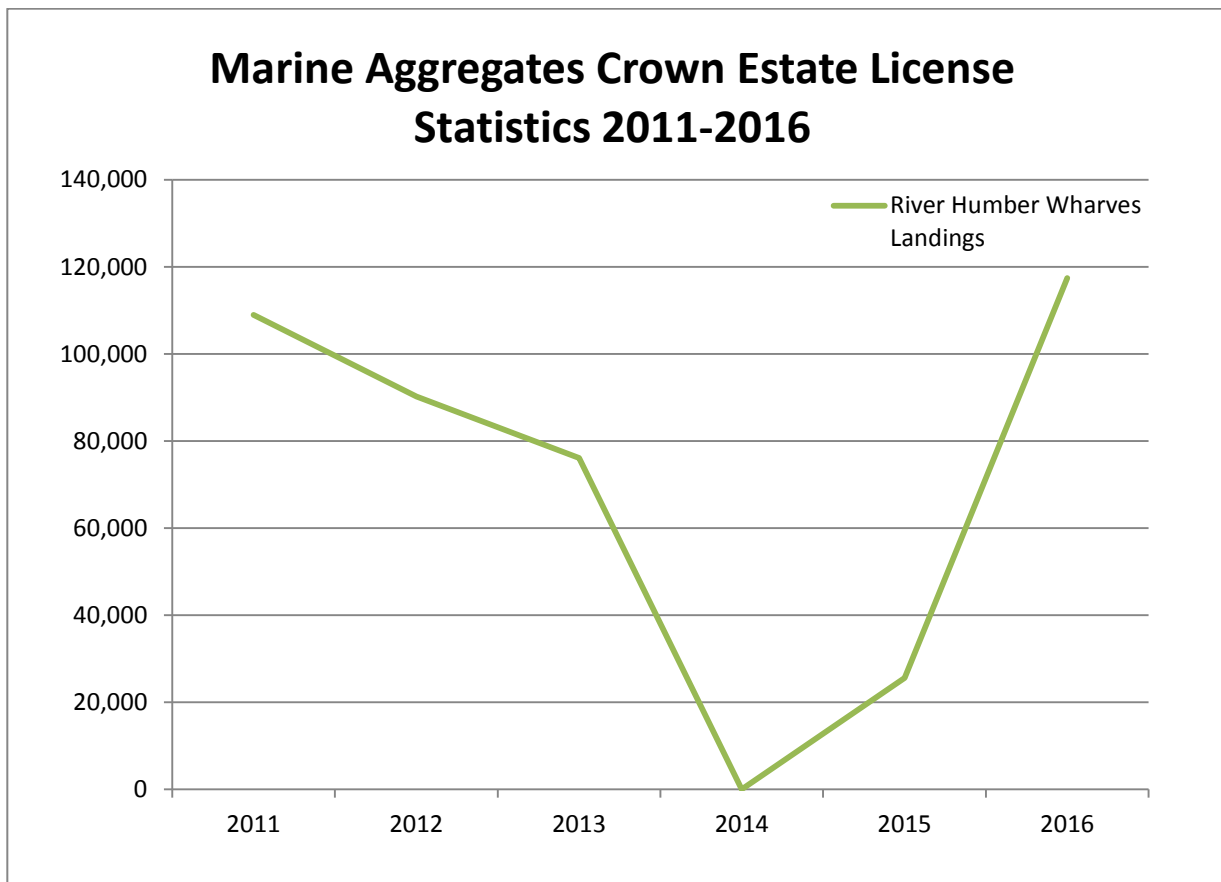
- 4.4.1. The part of the North Sea situated adjacent to the Yorkshire and Humber coast is known to contain hundreds of millions of tonnes of good quality sand and gravel, which is of a higher quality than most of the indigenous sand and gravel in West Yorkshire. Marine aggregate is substitutable for land won sand and gravel and marine coarse sand is known to be a desirable product for concreting.
- 4.4.2. There are 7 production licences, operated by CEMEX UK Marine Ltd, Hanson Aggregates Marine Ltd, Tarmac Marine Ltd, Van Oord UK Ltd and Westminster Gravels Ltd for both sand and gravel, in the Humber marine region. The number of production licences has increased from 3 noted in previous WY LAAs.
- 4.4.3. During 2016, 1.35 million tonnes of construction aggregate were dredged from a permitted licensed tonnage of 4.80 million. In addition 0.01 million tonnes were dredged for reclamation fill and 0.45 million tonnes were dredged for beach nourishment. However, despite the availability of this high quality resource, there is no evidence that any significant quantities of marine aggregate currently enter the West Yorkshire market.
- 4.4.4. Indeed a relatively low quantity of marine dredged aggregate enters the Regional market; however statistics do show a significant increase from 2015 to 2016. The Marine Aggregates Crown Estate Licences summary of statistics 2016 indicates that in 2016 approximately 117,417 tonnes of marine aggregate extracted from crown estate licensed areas was landed at wharves on the River Humber (an increase of 450%). In addition 29,904 tonnes were landed at Blyth, 215,142 were landed at wharves on the River Tees and 312,469 tonnes were landed at wharves on the Tyne³. The industry has confirmed that currently they consider licenced extraction areas to be under-utilised.
- 4.4.5. Minerals Planning Officers from East Yorkshire have indicated that the significant increase in landings in 2016 compared to 2015 is likely to be due to a temporary disruption to landing facilities at the Humber Docks during 2014/ 2015, with the 2016 figure returning to a more normal level. This contention tallies with the long term data trend as shown by the table and chart below:

TAB21 – River Humber Landings Stats

Marine Aggregates Crown Estate License Statistics 2011-2016						
*Figures in tonnes	2011	2012	2013	2014	2015	2016
River Humber Wharves Landings	108,927	90,194	76,102	0	25,561	117,417

³ Statistics obtained from Marine Aggregates The Crown Estate Licenses Summary of Statistics 2016.

FIG13 – River Humber Landings Trend



- 4.4.6. In 2013 all Mineral Planning Authorities within the Yorkshire and Humber Region and the Crown Estate funded and commissioned a marine aggregate study. The purpose of the study was to establish the reasons why so little marine sand and gravel is utilised in the Region and to establish the barriers to its much greater use. The study was published in February 2014.
- 4.4.7. The study explains that the cost of transportation from the Humber to the large markets of West and South Yorkshire are currently not competitive with the price of land won aggregate hauled from Nottinghamshire and North Yorkshire into the conurbation. It suggests the gap is not very large and will narrow in the period from 2020 onwards as land based extraction becomes more costly to sustain.
- 4.4.8. However there is a lack of infrastructure for landing the aggregate and transferring it for transport to the conurbation. The report indicates that as the cost gap narrows further there will need to be investment in wharves, sidings, trains and barges to facilitate large scale transfer of aggregate westward from the Humber. Nonetheless, in the shorter term (the next 5 years), it is possible that small scale transfer by canal barge may begin using existing facilities and equipment.
- 4.4.9. It is understood that the industry are in the initial stages of looking to develop marine aggregate supply into West Yorkshire and adjacent areas

via the Humber river. With options for wharf sites with rail-heads in either Grimsby, Immingham, Hull or Goole.

- 4.4.10. Partially in recognition of the strategic importance of marine aggregates and associated transportation infrastructure, Leeds City Council have safeguarded potential and existing aggregate wharves through their Local Plan. The policies provide protection for existing railway sidings and canal wharves for freight use and also allocate a new wharf site and a new rail siding site. The rail siding site is specifically for minerals freight. Similarly draft policy PLP 39 of the submitted Kirklees Local Plan seeks to protect strategic minerals infrastructure within Kirklees including several railway sidings and a wharf on the Calder and Hebble Navigation formerly used to offload coal for the former Thornhill Power Station.
- 4.4.11. An application for the development of a new aggregate wharf at Haigh Park Road, Sourton, was approved by Leeds City Council on 02 April 2015. This new wharf is expected to distribute approximately 2,000 tonnes per week of aggregate (sand and gravel) arriving from the Humber Ports. However Leeds City Council have report concerns over the further development of rail siding and wharf infrastructure suitable for the handling of aggregates, reporting that the following issues are likely to preclude the importation of aggregate, particularly marine aggregate, by rail and canal into Leeds:
- i. The dominance of major aggregate operators is preventing independent operators from securing suitable sites for mineral or mineral-related uses, i.e. particularly in respect of sites safeguarded in the Leeds adopted Development Plan for mineral-related rail freight use.
 - ii. The pressure to build residential property in Leeds (as we currently do not have a 5-year housing land supply) is resulting in residential planning permissions being approved that then may/will go on to constrain mineral activity, including sites in the Leeds adopted development plan that are safeguarded or allocated for mineral use/mineral freight use.
 - iii. That safeguarded wharf and rail sites in Leeds are lost to other development as land owners demonstrate that the sites are unlikely to be used for mineral freight purposes. Current uptake of the sites for minerals freight is low.
- 4.4.12. In order to further understand the potential barriers to efficiently distributing marine aggregates within the Region the Crown Estate has let a contract to ARUP to look in more detail at the logistics of marine aggregate transportation. This should better inform Local Authorities in terms of how to plan for and facilitate a potential future increase in the use of marine won aggregates within West Yorkshire and unlock the potential for this resource to compensate for the diminishing availability of land won concreting sand and gravel.
- 4.4.13. There have been recent positive moves forward in terms of the delivery of enhanced canal freight infrastructure to provide a marine transportation route between Leeds and the Humber with the Canal & River Trust confirming in July 2017 that they have been awarded a 1.7 million euro

grant from the EU Interreg funding programme (north sea region) that will help them to deliver their Freight aspirations for the Aire & Calder and their proposed Inland Port of Leeds.

- 4.4.14. The funding is to deliver the Trust's 'Inland Waterway Transport Solutions' (IWTS) project. The primary aim of IWTS is to improve the infrastructure of smaller waterways to help them realise their potential. From a Trust's perspective, IWTS project will provide funding for a costed technical and engineering study of the Aire & Calder bottlenecks (primarily Bullholme Lock) with a view to increasing the size of ship that can sail the navigation, and subsequently the amount of freight that can be carried. Other ancillary items will also be financed through the project that will help to deliver freight aspirations for the Aire & Calder.

4.5. Potential for Improved Aggregate Rail Freight Connections

- 4.5.1. As part of the consultation on the WYLAA 2017 the Yorkshire Dales National Park Authority have made representation raising concerns about the limitations of the existing aggregate rail connections between Yorkshire Dales quarries and West Yorkshire. In particular they have highlighted the shortcomings of the current infrastructure, with off-loading/ distribution depots only available at Cross Green (Leeds). Having limited off-loading points restricts the potential for aggregate transported by rail from the Yorkshire Dales to be sustainably distributed to all of West Yorkshire.
- 4.5.2. The availability of aggregate rail off-loading facilities within West Yorkshire is a particularly significant issue, as aggregates from the Yorkshire Dales provides for a very significant proportion of West Yorkshire aggregate consumption, particularly in terms of high specification aggregates. Furthermore the Yorkshire Dales National Park Local Plan is seeking a minimum of a 50% reduction in the road haulage of quarry products and is consequently imposing increasingly tight restrictions on quarry HGV movements.
- 4.5.3. Aggregate is transported into Leeds by rail from Swinden Quarry, and also from Ingleton Quarry, via Ribbleshead. Additionally Acrow and Dry Rigg Quarries were reconnected to the Settle-Carlisle railway line in late 2015/ early 2016. This reconnection took place as part of a £6 million scheme funded by Tarmac Holdings Ltd (the operator of the quarries and one of the aggregate depots at Cross Green). The project essentially involved the construction of a 750 yards stretch of new railway ending in a fan siding at Acrow Quarry. At the time of opening it was estimated that the new rail link would allow approximately 16,000 aggregate lorry loads per year to be transported by rail, i.e. between 100,000 and 200,000 tonnes of aggregate⁴.
- 4.5.4. The aggregate transported by rail from quarries in the Yorkshire Dales is currently primarily offloaded at the rail aggregate depots at Cross Green in Leeds from where it is processed and transported to consumers within the relevant market area via HGV. The Yorkshire Dales National Park Authority

⁴ RailEngineer, 5th January 2017, Rail News Report, *Get Connected*..

contend that the current restricted aggregate off-loading facilities available to quarry operators in the Yorkshire Dales limits the potential for increased rail haulage of minerals. Figure 14 below illustrates the approximate area which may benefit from the additional rail depot.

FIG14 – Rail Link Between West Yorkshire and the Yorkshire Dales



Source: Base Map from Google Maps 2017

- 4.5.5. The provision of a new aggregate rail depot within this area would depend upon both suitable land being available in an appropriate location and either private or public sector investment being available to construct and operate the facility. The land use planning system can play its role through either safeguarding potentially suitable land or allocating sites for development. It is recommended that further research is undertaken to understand (a) the potential scale of benefit which developing an addition aggregate rail offloading facility in the west of West Yorkshire would bring about (b) the availability of potentially suitable sites for an aggregate rail depot (c) the commercial viability of developing such a facility.
- 4.5.6. If this further research indicates that the development of such a facility would be significantly beneficial, in terms of the sustainable transportation of aggregates, that suitable sites are available and that the development of such a site would be viable, then opportunities for safeguarding or allocating a suitable site should be considered within relevant Development Plans, including the Bradford Allocations Development Plan Document.

4.6. Factors Which May Influence Future Demand

- 4.6.1. A key element of an LAA is the consideration of whether there are any known factors which may affect future demand for minerals. Such factors can include population growth, economic trends or significant infrastructure projects.
- 4.6.2. In considering future changes in aggregate provision it should be borne in mind that total Yorkshire and Humber aggregate sales, at approximately 3.09 million tonnes of sand and gravel and 11.2 million tonnes of crushed rock aggregates in 2016, represent only 58% and 85% of the figure calculated by the government to be necessary to maintain adequate aggregate supplies in 2009 in their 2005-2020 aggregate provision guidelines. Therefore it could be argued that current aggregate production levels fall significantly below the levels likely to be required to adequately meet demand, irrespective of any potential future changes in demand.
- 4.6.3. The approach taken in the first West Yorkshire LAA was to recognise that a number of factors may affect future demand but to revert to the 10 year average sales method of land bank calculation, given the acknowledged difficulties associated with attempting to predict future changes in demand with any degree of accuracy. However a commitment was made to reviewing this position during the preparation of subsequent LAAs and taking advantage of any evidence which becomes available in the future to adjust the landbank aggregate apportionment figure to take account of likely future changes in demand.
- 4.6.4. During the process of preparing the 2014 LAA it was identified that North Yorkshire County Council had undertaken substantial demand forecasting work as part of the preparation work for their Local Plan and future LAAs. This work was set out in their July 2014 discussion paper Forecasting demand for aggregate minerals and was incorporated into the North Yorkshire Sub-region LAA (NYLAA) First Review, February 2015. The methodology included in the demand forecasting discussion paper was updated and revised prior to incorporation in the NYLAA first review and has been further revised through and the Second Review July 2016 paper which was ratified by the Yorkshire and Humber AWP on 28 September 2016.
- 4.6.5. The North Yorkshire approach, whilst recognising the difficulties and uncertainties associated with forecasting aggregate demand, suggested a forecasting methodology based on linking future demand to the predicted rate of change of future house building across the main market areas served by North Yorkshire (including West Yorkshire). Further adjustments were then made to take account of changing aggregate supply patterns (supply constraints in West and South Yorkshire).
- 4.6.6. This forecasting method is based upon a comparison of 10 year average historic house completions with the target future house building rates set out in relevant Local Development Plans. The figure arrived at within the NYLAA First Review document was that a 53% uplift in house building

would be required to meet planned housing provision levels within the market area for minerals extracted from the North Yorkshire sub-region.

- 4.6.7. The potential for one-off infrastructure projects to increase aggregate demand was also considered but the NYLAA first review assesses that there is no strong basis for concluding that aggregate demand associated with infrastructure projects is likely to increase significantly over and above historic average levels.
- 4.6.8. For the purposes of deriving figures which are specifically relevant to West Yorkshire, a similar exercise has been undertaken as part of the West Yorkshire Local Aggregates Assessment 2017, comparing 10 year average historic house completions with the target future house building rate set out in relevant Development Plans for Bradford, Leeds, Calderdale, Wakefield and Kirklees. These data have been taken from the net housing completion data published by the government and emerging or adopted Local Plan Documents for the relevant Local Authorities. The results of this comparison are set out in tables 22 and 23 below, and illustrated in Figures 15, 16 and 17:

TAB22 – Planned Housing Delivery in West Yorkshire

District	Document	Stage	Date of Document	Planned Housing Delivery	Plan Period	Plan Years	Annual Housing Delivery Target
Leeds	Core Strategy	Adopted	12/11/2014	70,000	2012 to 2028	16	4,375
Bradford	Core Strategy	Main Mods	Nov-15	42,100	2013 to 2030	17	2,476
Kirklees	Local Plan	Draft	Nov-15	29,340	2013 to 2031	18	1,630
Wakefield	Core Strategy	Adopted	15/04/2009	28,800	2008 to 2026	18	1,600
Calderdale	Potential Sites and other Aspects of the Local Plan	Draft	06/11/2015	17,651	2015 to 2032	17	1,038

TAB23 – Comparison of Housing Targets vs. Completions

	Planned Annual Housing Requirement	2006-15 Average Housing Completions	Uplift Required	% Uplift Required
Leeds	4,375	2,229	2,146	96%
Bradford	2,476	1,352	1,124	83%
Wakefield	1,600	1,054	546	52%
Kirklees	1,630	1,338	292	22%
Calderdale	1,038	625	413	66%
W Yorks Total	11,120	6,598	4,522	69%

FIG15 – 10 Year Housing Delivery Trend West Yorkshire

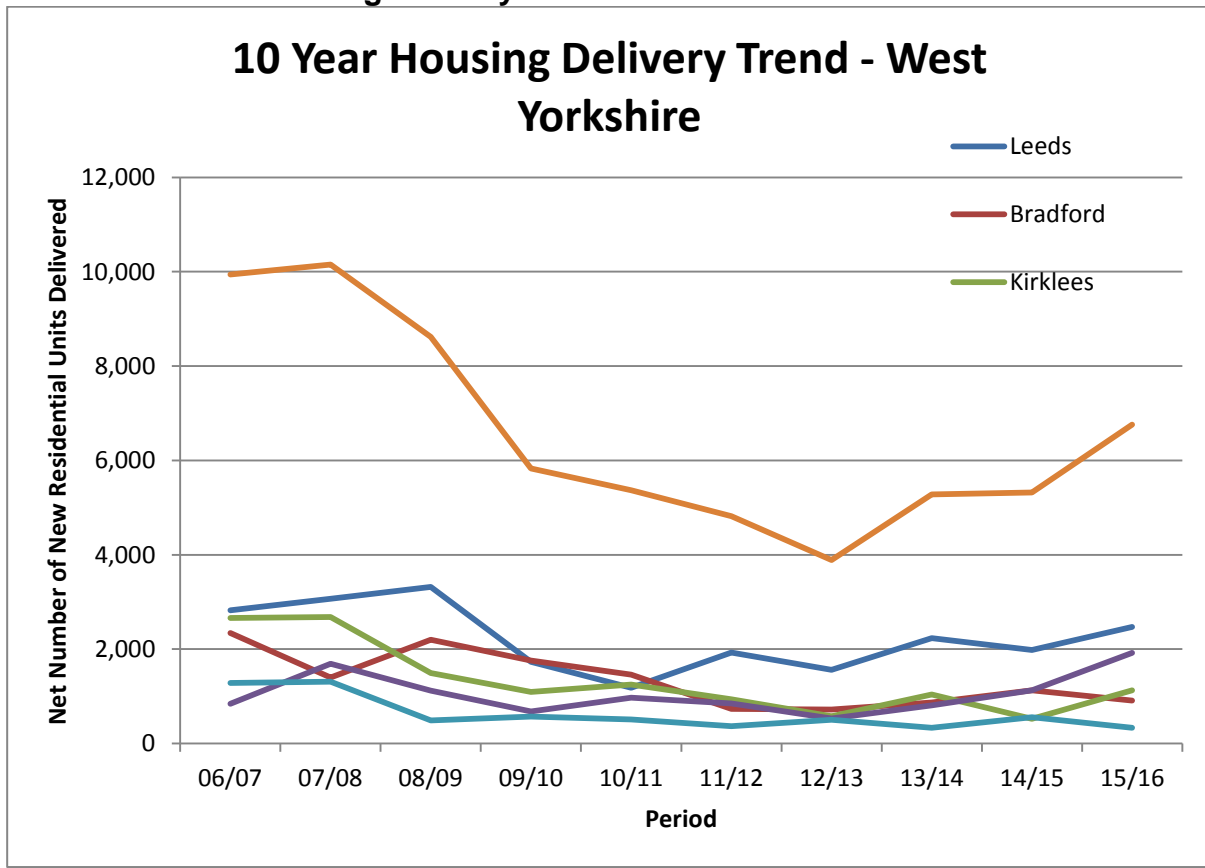


FIG16 – 10 Year Housing Delivery Trend vs. Planned Future Delivery Levels

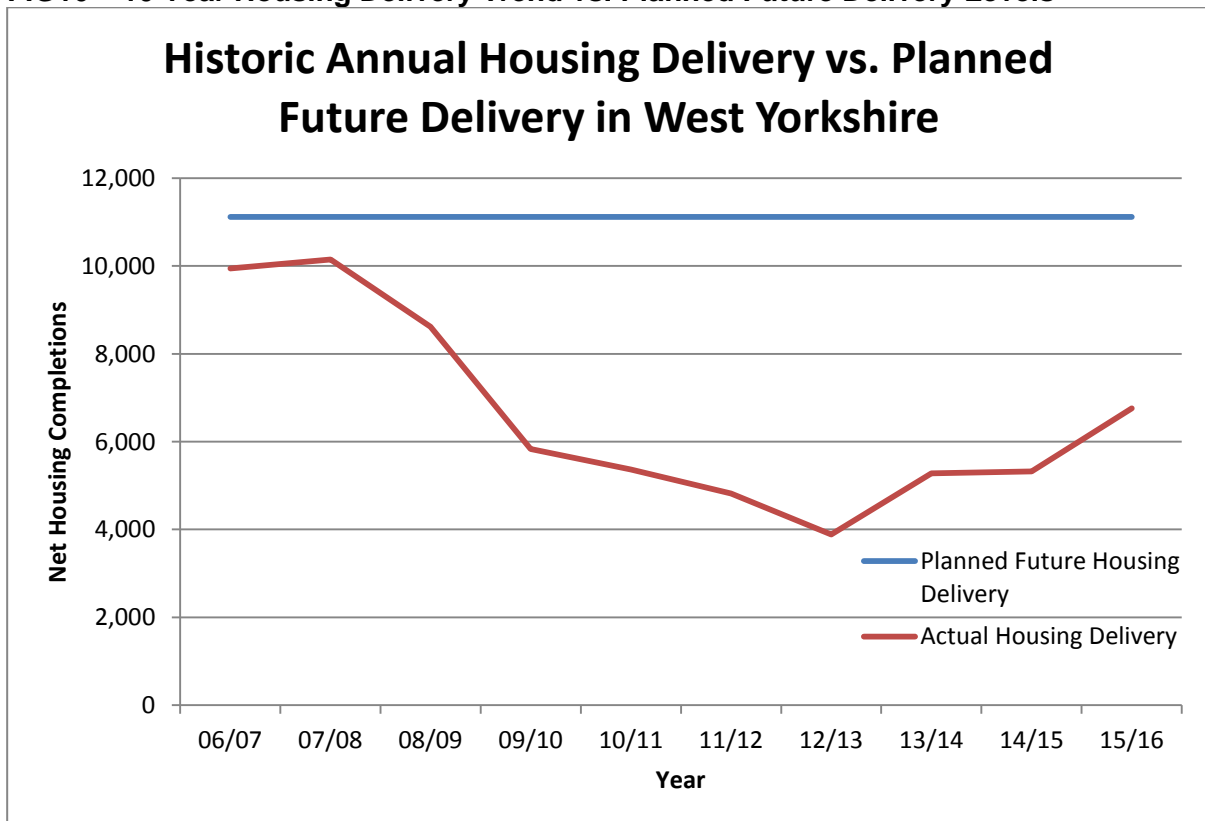
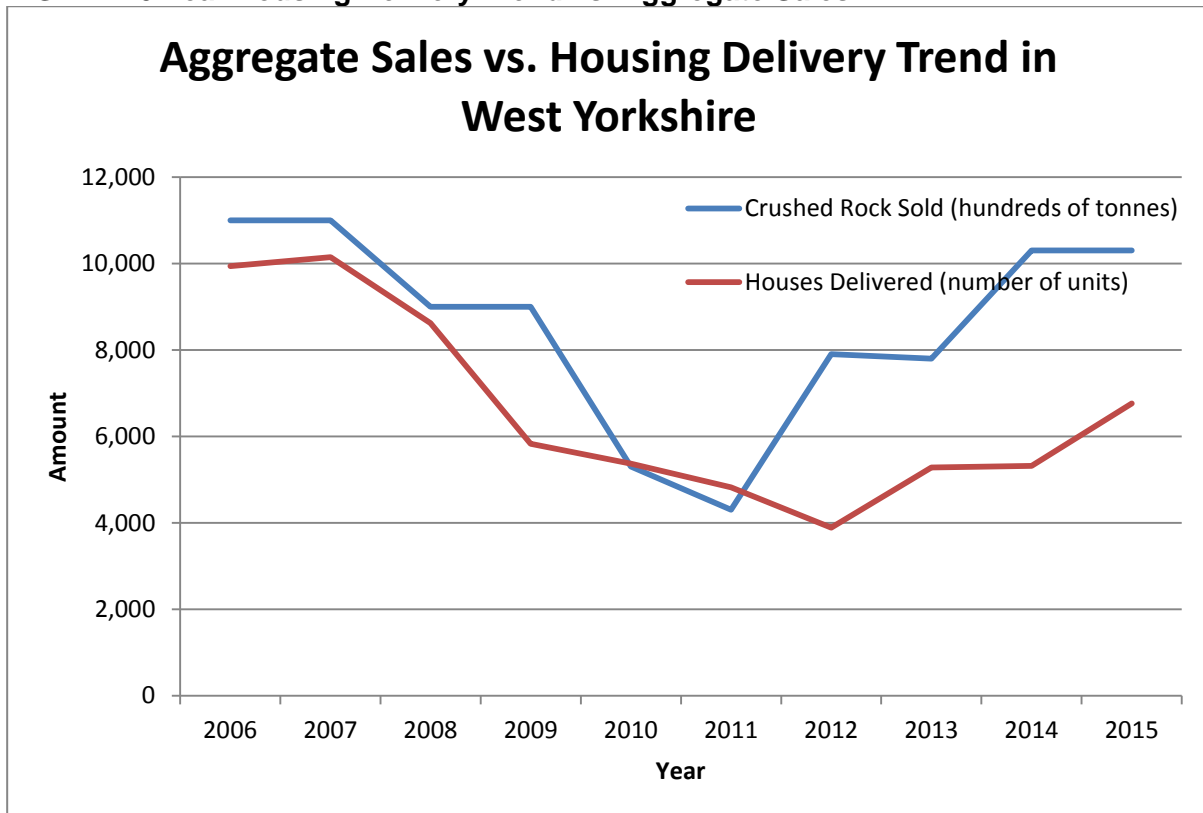


FIG17 – 10 Year Housing Delivery Trend vs. Aggregate Sales



4.6.9. Notwithstanding the apparently clear association between aggregate sales and housing delivery shown in Figure 17 above, there has been some debate about the precise relationship between increased house building and increased demand for aggregates. North Yorkshire initially proposed an estimate of house building accounting for only 15% of aggregate demand. However the Minerals Products Association raised concerns in relation to this estimate and set out their view that it would be safer to link housing growth to 100% of demand.

4.6.10. The NYLAA First Review includes consideration of a range of approaches to link the housing uplift figure to aggregate demand. The outcome of this consideration is a proposed 25% uplift in relation to sand and gravel (assuming that approximately 50% of demand for sand and gravel is likely to be associated with house building).

4.6.11. In relation to crushed rock the NYLAA first Review indicates that industry representatives have expressed the view that there is more uncertainty about the future level of demand and its link to housing growth. The NYLAA First Review therefore adopts a more conservative approach of uplifting the crushed rock sales average by 16%.

4.6.12. The NYLAA draft second review document calculates future provision for sand and gravel at an overall annual rate equivalent to 2.44mt and an annual rate of 3.75mt for crushed rock for the period 2015 to 2030. These figures are around 28% and 17% higher respectively than those which

would be derived using 10 year average sales (excluding sales of crushed rock from the YDNP).

- 4.6.13. For West Yorkshire it is acknowledged that demand for the generally lower specification aggregates produced within the sub-region relates minimally to the economic demand for the consumption of aggregates within West Yorkshire. This is particularly the case in relation to the need for concrete grade aggregates and roadstone as these materials are not produced in significant quantities within West Yorkshire.
- 4.6.14. Therefore the purpose of applying an uplift to sales averages is not to allow for the aggregates required to deliver planned housing growth to be provided for from within West Yorkshire. Instead the uplift should be seen as a mechanism to compensate for the increased pressure future housing and economic development within West Yorkshire will place upon minerals supplies derived from neighbouring authorities and to relieve pressure on neighbouring authorities to supply lower specification aggregates.
- 4.6.15. Furthermore it should be noted that the role that West Yorkshire plays in aggregate supply is dominated by crushed rock aggregates rather than sand and gravel. Therefore applying a lower uplift to the crushed rock aggregate apportionment, the approach taken in the NYLAA, would disproportionately diminish the implied overall target for increased aggregate production from West Yorkshire.
- 4.6.16. In this context it is considered appropriate to apply a less conservative method within the West Yorkshire LAA. Therefore the uplift approach adopted in the 2017 LAA, is to assume that the increase in aggregate production required to deliver planned housing growth would be approximately 50% of the required increase in house building in relation to both crushed rock and sand and gravel aggregates.
- 4.6.17. The West Yorkshire specific data set out in table 23 indicates that the increase in house building which would specifically be required for West Yorkshire to meet the housing requirements calculated within adopted and emerging Local Plans is 69% which can be rounded to 70%. On this basis it is considered appropriate to plan for a 35% uplift in aggregate supply within West Yorkshire to compensate for the increased demand house building growth in West Yorkshire will place upon aggregate supplies from neighbouring authorities.
- 4.6.18. Planning for a 35% increase in aggregate provision should also help West Yorkshire contribute to moving the Region closer to the aggregate provision figure set out in the 2005-2020 guidelines. Further details of the methodology used to calculate the uplift percentage can be found at Appendix 3 to this report.

5. SUMMARY AND CONCLUSIONS

5.1. The NPPF advises that a Local Aggregate Assessment should set an aggregate apportionment based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options. As set out in the main body of this report, the average historic annual sales of Sand and Gravel and Crushed Rock Aggregates from West Yorkshire is as follows:

TAB24 – Aggregate Historic Sales Average

Aggregate Type	Average Annual Tonnage
Sand and Gravel	90,000 (0.09mt)
Crushed Rock	860,000 (0.86mt)

5.2. Significant, mainly lower specification, reserves of crushed rock aggregate remain within West Yorkshire. However, as of 31 December 2016, only one active sand and gravel extraction site remains within West Yorkshire possessing relatively modest reserves. Based upon the aggregate provision figures for Yorkshire and the Humber set out in the government guidelines for the 2005-2020 period there appears to be a continuing under supply within both West Yorkshire the wider Region in relation to the quantity of aggregates which would be required to fully meet economic requirements.

5.3. It is possible that the need for virgin land won aggregate may be tempered by improved efficiency and economy of use, substitution with marine-won aggregates and by improved specifications for secondary and recycled aggregates leading to their greater market penetration. However it is not possible to state with any confidence at this stage that the demand for land won-aggregates is likely to diminish in the foreseeable future. If adequate local supplies of aggregate cannot be maintained material will have to be procured from wider national or global supply markets at a potentially increased cost to the economy and the environment.

5.4. The objective in setting an aggregate apportionment for West Yorkshire must exclude the possibility of meeting our own aggregate needs, but rather instead is intended to set a level of future provision for the lower quality aggregates which the sub-region is capable of producing which is sustainable and appropriate. This is because the quality of the primary aggregates produced within West Yorkshire generally cannot meet more demanding specifications such as those applied to concreting aggregate or roadstone.

5.5. In summary the other relevant local information which has been considered in preparing the Local Aggregates Assessment for West Yorkshire 2017 is as set out in Section 4 and summarised in Table 25 overleaf:

TAB25 – Summary of Other Data Relevant to Calculating Landbanks

Data Type	Annual Tonnage
Conjectured West Yorkshire Apportionment of Regional Guidelines for Aggregates Provision in England: 2005-2020 – West & South Yorkshire Sand and Gravel	500,000
Conjectured West Yorkshire Apportionment of Regional Guidelines for Aggregates Provision in England: 2005-2020 West Yorkshire Crushed Rock	1,220,000
Estimate of West Yorkshire Sand and Gravel Consumption set out in the 2014 aggregate minerals survey for England and Wales	702,000
Estimate of West Yorkshire Crushed Rock Consumption set out in the 2014 aggregate minerals survey for England and Wales	2,536,000
Estimate of Recycled & Secondary Aggregate Produced in West Yorkshire in 2016	980,000
Estimate of Land Won Sand and Gravel Imported to West Yorkshire from other Regions/ Sub-Regions in 2014	685,000
Estimate of Land Won Crushed Rock Imported to West Yorkshire from other Regions/ Sub-Regions in 2014	1,997,000
Estimated Proportion of West Yorkshire Sand and Gravel Consumption Met by Imports in 2014	98%
Estimated Proportion of West Yorkshire Crushed Rock Aggregate Consumption Met by Imports in 2014	79%
Estimated Increase in Aggregate Production Required for Deliver Planned Increases in Housing Delivery within West Yorkshire	35%

5.6. On the basis of the information discussed in Section 4 of this report, ten year sales averages alone are not considered to be adequate to use as the basis for calculating the aggregate landbank for West Yorkshire. This is both because of the depressing effect of the recession on the sales average for crushed rock aggregates and because the sales average figure does not allow for the increase in aggregate production which would be required to deliver the planned level of house building within West Yorkshire over the next 15 years (with a 69% increase in house building required to meet anticipated housing needs). A strong relationship is apparent between housing delivery and aggregate production, as illustrated by Figure 17.

5.7. It is concluded that applying a 35% uplift to historic sales averages arrives at an apportionment figure which embodies some aspiration for West Yorkshire to play its role in providing for projected increased future house building requirements whilst remaining realistic and proportionate to the constraints of the West Yorkshire aggregate resource.

5.8. The aggregate apportionments and landbank calculations set out in table 26 below are therefore proposed for the Local Aggregate Assessment for West Yorkshire 2017. It is acknowledged that apportionment for West Yorkshire remains low; however the significant contribution of West Yorkshire to the supply of Recycled and Secondary Aggregates assists in mitigating the reliance on adjacent major aggregate producing Regions.

TAB26 – West Yorkshire Aggregate Landbanks 2016

Note: All Figures in Tonnes Unless Otherwise Stated	Reserve	Annual Sales Average 2007-2016	35% Uplifted Aggregate Apportionment	Landbank
Sand and Gravel	770,000	90,000	120,000	6 Years 5 Months
Crushed Rock	29,820,000	860,000	1,160,000	25 Years 8 Months

5.9. The Sand and Gravel landbank of 6 Years and 5 Months has now fallen below the 7 year minimum landbank length required to be maintained by paragraph 145 of the National Planning Policy Framework (NPPF). Although the sand and gravel landbank appears to be close to meeting the minimum level required by the NPPF, this primarily reflects the sustained low level of sand and gravel extraction in West Yorkshire. The sand and gravel landbank figure should not be taken to imply in any way that supplies of the sand and gravel consumed within West Yorkshire (which are primarily sourced from North Yorkshire) are secure. There is a pressing need to source, where possible, sand and gravel from West Yorkshire, including production of sand from hard rock quarries.

5.10. The crushed rock aggregate landbank of 25 Years and 8 Months remains significantly greater than the 10 year minimum landbank length which the NPPF requires Minerals Planning Authorities to plan for the sustenance of. However crushed rock reserves remain substantially below pre-recession levels and should not therefore necessarily be seen as excessive or problematic.

5.11. It should also be noted that the landbank length guidelines included within the NPPF are minimums not maximums. Mineral Planning Authorities, including West Yorkshire Authorities and those neighbouring authorities who supply significant quantities of aggregate into West Yorkshire as illustrated by the minerals flow diagram at Figure 9), should also consider other relevant information when assessing the need for the release of additional aggregate reserves.

5.12. Key Messages and relevant considerations when assessing proposals and allocations for minerals development and associated infrastructure:

- i. The unsuitability of a substantial proportion of the currently permitted reserves of crushed rock aggregate within West Yorkshire for higher specification uses, such as concrete making and roadstone.
- ii. The continuing dependence of West Yorkshire upon neighbouring authorities for the majority of its construction aggregate needs, particularly in relation to concrete and roadstone grade crushed rock aggregates and concrete grade sand and gravel.
- iii. The reliance of West Yorkshire upon high specification crushed rock sourced from the Yorkshire Dales National Park; an area where the NPPF indicates extraction should be reduced (as far as is practicable).
- iv. The relatively low contribution which West Yorkshire currently makes to the overall supply of construction aggregates within the Yorkshire and Humber Region, particularly in relation to sand and gravel.
- v. The benefits of pursuing any sustainable opportunities to contribute towards the supply of the generally lower specification aggregates produced within West Yorkshire, and continuing to provide facilities for the production of recycled aggregates, in terms of compensating for West Yorkshire's economic dependence upon primary aggregates quarried from neighbouring authorities.
- vi. Production of sand from crushed rock and blockstone quarries as an additional/alternate source of sand.
- vii. The need to safeguard existing rail and wharf infrastructure and identify potential new locations for wharves and rail depots within West Yorkshire to facilitate the sustainable transportation of both land won and marine aggregates into West Yorkshire in the future, particularly crushed rock aggregates from the Yorkshire Dales and marine aggregates landed at the Humber Docks.

6. ROLE OF LOCALISM IN AGGREGATE SUPPLY

6.1. Background

- 6.1.1. The Localism Act and the National Planning Policy Framework (NPPF) places a duty on local planning authorities and other bodies to cooperate with each other to address strategic issues relevant to their areas. The duty requires continued constructive and active engagement on the preparation of development plan documents and other activities relating to the sustainable development and use of land, including minerals.
- 6.1.2. Paragraph 181 of the NPPF states that ‘Local planning authorities will be expected to demonstrate evidence of having successfully cooperated to plan for issues with cross-boundary impacts when their local plans are submitted for examination’. This document will help demonstrate the joint working taking place between authorities and will accompany the submission of local plan documents.
- 6.1.3. The ‘duty to cooperate’ is set out in Section 110 of the Localism Act. This applies to all local planning authorities, national park authorities and county councils in England. The new duty relates to sustainable development or use of land that would have a significant impact on at least two local planning areas or on a planning matter that falls within the remit of a county council; It requires that councils:
- set out planning policies to address such issues;
 - ‘engage constructively, actively and on an ongoing basis’ to develop strategic policies; and
 - consider joint approaches to plan making.
- 6.1.4. Paragraph 17 of the NPPF sets out the strategic issues where cooperation might be appropriate. Paragraph 178 to 181 of the NPPF gives guidance on ‘planning strategically across local boundaries’, and highlights the importance of joint working to meet development requirements that cannot be met within a single local planning area.

6.2. Securing the Necessary Aggregate

- 6.2.1. Bradford, Calderdale, Kirklees, Leeds and Wakefield Councils [together with Yorkshire Dales National Park Authority, NYCC, Doncaster Council, East Riding and Humberside and Derbyshire and the Peak District] have a relationship in the supply and use of primary minerals.
- 6.2.2. The purpose of this statement is to set out how the Councils will proceed in liaison with the AWP’s to ensure the development of a consistent and complementary policy approach towards minerals supply. The authorities will seek to cooperate to the areas of joint or further work set out below.

- 1) The provision and sustainable use of aggregate minerals ensuring the sufficient supply of material to provide the infrastructure, buildings and goods required to sustain the economy and deliver planned growth.
- 2) Sharing advice and information (including aggregate monitoring information) to complement the preparation of aggregate assessments such as landbanks, locations of permitted reserves relative to the market, and capacity of reserves.
- 3) The Councils will continue to work together in the future to prepare joint or individual local aggregates assessments and also co-operate in the production of wider regional aggregate assessments within their relevant aggregate working party areas.
- 4) The Councils will share information as soon as available, including draft local plan consultation documents prior to the consultation taking place to allow early engagement.

6.3. Agreements to be Sought

- 6.3.1. Under the Duty to Cooperate the West Yorkshire authorities will need to seek agreement with NYCC, East Riding, Doncaster, Derbyshire and Yorkshire Dales to ensure that these authorities are continuing to provide for sustainable supplies of aggregates into West Yorkshire in their Local Plans.
- 6.3.2. Such an agreement has been reached with NYCC and a report on the connectivity between minerals planning in West Yorkshire and the North Yorkshire Sub Region was ratified by the relevant Leeds City Region/ West Yorkshire Combined Authority Portfolio Holders on 18 September 2015. The connectivity report confirmed that: 'Consideration should also be given to a similar endorsement between WYCA and Derbyshire CC'. The report also confirmed that:

'Discussion and liaison continues to take place at officer level between North Yorkshire County Council (NYCC), Derbyshire and the West Yorkshire authorities, with the WY Lead officer for WYCA meeting/liasing with NYCC to discuss the particular connectivity issues for a range of minerals and waste matter'.
- 6.3.3. A meeting between the lead officer for Minerals and Waste Planning of the West Yorkshire Combined Authority/ Leeds City Region and representatives from Derbyshire CC has now also taken place, with a view to progressing a similar connectivity agreement between Derbyshire and West Yorkshire. This document will serve to acknowledge and formalise the minerals planning linkages between West Yorkshire and Derbyshire.
- 6.3.4. Recent BGS data confirms the large quantity of crushed rock which is exported to West Yorkshire from Doncaster. This highlights the need for further discussion/ agreements between the West Yorkshire and Doncaster/ South Yorkshire Minerals Planning Authorities.

- 6.3.5. One of the outcomes of the joint working which has been undertaken with neighbouring authorities is the production of a joint Report on Magnesian Limestone, which also encompasses the extent of the resource occurring within the North and South Yorkshire. This document has identified cross-boundary minerals planning issues associated with the supply of, and demand for, Magnesian Limestone and will help to inform the approach taken to planning for this resource in relevant Local Plans and Local Aggregates Assessments.
- 6.3.6. Moving forward the West Yorkshire Combined Authority recognises the importance of engaging with all relevant neighbouring authorities to ensure continuity of supplies of aggregates into the future. In particular further liaison will be required in relation to the shifting patterns of sand and gravel supply from North Yorkshire and Nottinghamshire and the implications of the shift in aggregate production away from the National Parks, particularly in terms of High Specification Aggregates.
- 6.3.7. Engagement will also be required with a range of stakeholders in relation to the supply of marine aggregates and the potential for a more significant proportion of West Yorkshire's sand and gravel needs to be met from marine dredged sources. Given the complexities of the supply chain for marine dredged sand and gravel, such liaison must necessarily involve the Crown Estate/ Marine Management Organisation as well as the Mineral Planning Authorities which host suitable landing wharfs and canal, rail and road transportation facilities.
- 6.3.8. Engagement will also be required with relevant transport route operators including Network Rail and the Canal and River Trust. Preceding sections of this report discusses the recent feasibility work initiated by the Canal and River Trust with a view to opening up canal/ navigation waterway routes for commercial transportation of goods between the Humber and Leeds. Progress towards fulfilling this objective will be monitored and will inform future inter-Minerals Planning Authority Discussions regarding marine sand and gravel opportunities, alongside other areas of work.
- 6.3.9. To this end a meeting was held in October 2017 between minerals officers representing the West Yorkshire Combined Authority and the Humber Area. During this meeting cross-boundary issues were discussed including the supplies of sand and gravel into West Yorkshire from East Yorkshire and also the potential for increased marine aggregate supply into West Yorkshire from landings at the Humber Docks. The importance of safeguarding the rail and wharf infrastructure within West Yorkshire which could facilitate the sustainable transportation of marine aggregates from the Humber was acknowledged.

Appendix 1

Active quarries which produce aggregate as at 31 December 2016

No.	QUARRY	OPERATOR	AGG TYPE
BRADFORD			
1	Hainworth Shaw Quarry, Keighley	Allan Bailey	Sandstone, grit
2	Bank Top Quarry, Harden	M&M York Stone Products	Sandstone, grit
3	Naylor Hill Quarry, Haworth	Dennis Gillson & Son	Sandstone, grit
4	Bolton Woods Quarry, Bradford	Hard York Quarries	Sandstone, fine
5	Fagley Quarry, Bradford	Hard York Quarries	Sandstone, fine
CALDERDALE			
6	Fly Flatts Delph Quarry, Warley	Rand & Asquith	Sandstone, grit
7	Mount Tabor Quarry, Halifax	Hard York Quarries	Sandstone, grit
8	Sunnybank Quarry/Delph Hill Quarry	Mr J Smith	Sandstone, grit
9	Ringby Quarries, Swalesmoor	Mr J Tooby	Sandstone, grit
10	Upper Pule/Scout Moor Swalesmoor	Cleanmet	Sandstone, fine
11	Northowram Hill Quarry, Northowram	George Farrar Quarries	Sandstone, fine
12	Sunny Bank Farm, Southowram	Mytholm Stone Sales	Sandstone, fine
13	Pond Quarry, Lightcliffe	Hard York Quarries	Sandstone, fine
14	Pasture House Farm, Southowram	Marshalls Natural Stone	Sandstone, fine
15	Cromwell, Southowram	Marshalls Natural Stone	Sandstone, fine
16	Spring Hill Quarry, Greetland	Spring Hill Stone Sales	Sandstone, fine
17	Elland Edge Quarries, Elland	Rand & Asquith	Sandstone, grit
18	Wood Top Quarry	Cleanmet	Recycled Aggregates
KIRKLEES			
19	Moselden Quarry, Scammonden	Marshalls Natural Stone	Sandstone, grit
20	Crosland Moor Quarries, Huddersfield	Johnson Wellfield Quarries	Sandstone, grit
21	Windy Ridge Quarry, Holmfirth	S. Peel and Son	Sandstone, grit
22	Hillhouse Edge Quarry, Holmfirth	Saxon Moor Ltd.	Sandstone, grit
23	Appleton Quarry, Shepley	Marshalls Natural Stone	Sandstone, grit
24	Sovereign Quarry, Shepley	Marshalls Natural Stone	Sandstone, grit
25	Temple Quarry, Grange Moor	Holgate Construction Lt	Sandstone, grit
26	Forge Lane Sand and Gravel Quarry	Dewsbury Sand & Gravel Lt	Sand & Gravel
LEEDS			
27	Hawksworth Quarry, Guiseley	Apperley Bridge Aggre. Ltd	Sandstone, grit
28	Moor Top Quarry, Guiseley	RG Stone Sales	Sandstone, grit
29	Blackhill Quarry, Bramhope	Mone Bros Excavations Ltd	Sandstone, grit
30	High Moor Quarry, Bramham	Samuel Smith Old Brewery	Limestone, mag.
31	Britannia Quarry, Morley	Woodkirk Stone Sales Ltd	Sandstone, fine
32	Howley Park Quarry, Morley	Marshalls Natural Stone	Sandstone, fine

33	WAKEFIELD Darrington Quarry (part), Knottingley	FCC Environment	Limestone, mag.
34	Plasmor Quarry, Knottingley	Plasmor Ltd	Limestone, mag.
Sites permitted but not worked			
	SITE		AGG.TYPE
	Strands, Horbury - W ROMP		Sand & gravel
	Foxholes, Normanton - W ROMP		Sand & gravel
	Penbank, Castleford - W ROMP		Sand & gravel

Appendix 2

Detailed Explanation of Uplift Calculation Methodology

- The uplift figure (U) is a figure intended to provide an estimate of the increase in production which would be required at quarries to meet the aggregate demands which would be associated with full delivery of the housing growth set out in emerging and adopted Local Plans.
- In order to undertake this calculation the following figures are needed.
- C – Historic Average Annual Number of Housing completions
- P – Planned Annual Housing Delivery
- H – % increase in house building required to meet Housing Delivery Targets
- A - % of quarry output utilised for house building and associated infrastructure
- Figure C was calculated by obtaining house completion data from Annual Monitoring Reports for the period 2013/14 and averaging out housing completions over this 10 year period for each of the 5 West Yorkshire Authorities as shown in column 2 of TAB21.
- Figure P was calculated from a review of the emerging or adopted Local Plans of the 5 West Yorkshire Authorities as shown in TAB 20.
- Figure H was calculated by totalling the C and P figures for West Yorkshire as a whole and applying the following formula to the totals:
 - $(P-C)/C$.
- The result for figure H based on the data in TAB21 was 0.62 or 62%, i.e. a 62% increase in 10 year average house building in West Yorkshire overall will be required to meet planned housing delivery targets for West Yorkshire overall.
- A is a difficult figure to derive without the benefit of an extensive research project which analyses the output of crushed rock and sand and gravel sites and identifies the fates of all quarried material categorising these fates into A) quarried material used directly or indirectly for house building and associated infrastructure and B) quarried material not used for any purpose associated with house building.
- North Yorkshire CC have undertaken some research in this regard and through a process of consultation eventually came to a compromise position with the Minerals Products Association who accepted that a figure of approximately 50% of output at sand and gravel sites could be associated with house building.
- More details of the methodology used to arrive at this 50% figure can be found in the following document:
 - 'Forecasting demand for aggregate minerals Discussion Paper - July 2014', published online by North Yorkshire County Council
- A lower figure was derived for crushed rock quarries; however, as West Yorkshire produces nominal amounts of sand and gravel and larger amounts of crushed rock, and the uplift figure is intended to compensate for West Yorkshire's reliance on aggregate material supplied from neighbouring authorities rather than allow for minerals needs associated with increased housing growth to be met from within West Yorkshire, it was considered appropriate to apply the higher figure of 50% for all West Yorkshire Aggregate.
- Having arrived at a satisfactory figure for H and A, i.e. 69% and 50% respectively the uplift in aggregate production required to deliver planned housing growth could then be calculated by applying the simple formula:
 - $H*A$, i.e. $0.62*0.5 = 0.345$.

- To avoid giving a false impression of precision the uplift figure U was rounded to the nearest 5% giving a figure for U of 35%
- The full formula could therefore be expressed as:

$$\mathbf{U = (((P - C) / C) * A) * 100}$$