Kent County Council

Local Aggregate Assessment 2019

April 2020

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Tables and Figures

Dashboard Summary - Kent County Council LAA2019 (using data for the calendar year 2018)

Aggregate Mineral Type (and origin; land-won, marine dredged and imports)	2018 Sales in tonnes or mt	Average (10 yr.) Sales in tonnes or mt	Average (3yr) Sales in tonnes or mt	Trend (10 yr. sales)	Trend (3 yr. sales)	LAA Rate mtpa	Reserve as per end of 2018 mt	Permitted Landbank (current Reserves divided by current sales)	LAA 7-year Landbank based on LLA Rate	Productive Capacity (tpa)	Comments
Soft Sand (excluding silica sand)	493,179	541,907	506,502	⬇	⇧	0.542	8.3	16.8 years	3.79mt and a 15.3 years NPPF maintained landbank at 2018	920,000 (compared to 895,000 in 2017)	The reserve base has decreased due to further extraction in 2018. The LAA rate is the same as the 10-year average, given it is considered that local modelling to justify an increase in this metric when calculating need is inherently unreliable. Therefore, the NPPF requirement as set out in paragraph 145 is considered the appropriate method to identify future supply needs. The recorded permitted reserves (8.3mt) will fall below the 7-year NPPF landbank minimum (3.825mt) in some 5 to 6 years' time at the current 10-year average sales extraction rate.
Sharp Sand & Gravel	119,259	401,508	176,658	⬇	⬇	0.401	3.3 (hoggin 0.54)	27.7 years	2.807mt and an 8.2 years NPPF maintained landbank at 2018	1,150,000 (compared to 1,101,000 in 2017)	The reserve base has decreased from 3.69mt in 2017 to 3.30mt in 2018, no new planning permissions have replenished the overall landbank over this time. The LAA rate is the same as the 10-year average, given it is considered that modelling to justify an increase in this metric is inherently unreliable. Therefore, the NPPF requirement as set out in paragraph 145 is considered the appropriate method to identify supply needs. As reported in LAA2018, the effect of operations moving across the Kent-East Sussex border continues to have the effect of lowering the sales averages and extending the apparent available landbank life in Kent. The historic Kent market, that the Lydd Quarry serves, continues to be supplied by materials from this site that are now extracted from outside Kent. The Kent landbank life and sales averages figures should be treated with caution as they are being lowered by the cessation of Kent recorded sales from Lydd. Actual consumption in Kent is undoubtedly higher than these metrics indicate.

											However, it is reasonable to assume that the pattern of sales and consumption along the east-west axis in this area of the two respective authorities has not necessarily materially changed. Therefore, it can be concluded that the Kent land-won sharp sand and gravel resources continue to be depleted by consumption at a rate similar to that of the past without replenishment.
All Sand & Gravel (land-won)	612,438	0.931mt	0.718mt	⬇	⬇	0.95	11.6	N/A	N/A	N/A	This demonstrates that Kent produces a significant quantity of land-won aggregate though the 10-year average is in decline, this being due to the reductions in sharp sand and gravel sales, and sales from one site now being recorded in East Sussex County Council's area. Both the short-term and longer-term sales average are showing a downward trend.
Crushed Rock (land-won)	c[1]	c	C	c	c	0.78[2]	c	c	In excess of 30 years	c	Kent continues to have only two active hard rock sites producing aggregates; therefore, the agreed level of confidentiality would be breached if the sales figures were to be disclosed.
Recycled/ Secondary Aggregates	0.757mt	0.816mt	0.897mt	⇧	⬇	0.816	N/A	N/A	N/A	4,008,000 (compared to 4,188,000 in 2017)	Sales of secondary and recycled aggregates (derived from both the C, D & E waste and industrial by-products sectors) slightly decreased in 2018 compared to 2017 (0.757mt compared to 0.906mt). However, the underlying trend is increasing given the three-year sales average trend increase. Overall productive capacity (as recorded from Annual Monitoring (AM) returns) is largely unchanged, with some slight decrease overall.

[1] C denotes a confidentiality has to be maintained

[2] 0.78 is the proxy for the anticipated land-won crushed rock production used in the adopted Kent Minerals and Waste Local Plan 2013-30, due to ongoing confidentiality this has not been updated

Marine Sand & Gravel (mt)	2.07mt	1.973mt	2.103mt	⇧	⇧	2.0	N/A	N/A	N/A	There is an increase in the 3-year and 10-year averages, in 2017 they were 1.812mt and 1.790mt respectively, now they are 2.103mt and 1.973mt. The increase shows that the importation of marine sand and gravel is potentially overcoming its static position seen in 2016-17 and is currently increasing possibly due to land-won supply reduction, though this remains clouded by the issue of some of Kent's production crossing the border into East Sussex. Soft sand from the marine environment remains insignificant overall in supply terms, though greatly increased at 24,350 tonnes when compared to only 121 tonnes in 2017.
Rock Imports by Sea	1.04mt	0.795mt	1.05mt	⇧	⇧	0.80	N/A	N/A	N/A	In 2017 the 10-year sales average was 0.77Mt and the 3-year average was 1.028Mt. Both sales averages have shown some increase in 2018, though not very significantly greater, is demonstrating a continuing upturn in hard rock imports via wharves.
Rail Depot Sales (Sand & Gravel)	28,194	43,960	27,175	⇩	⇩	0.04	N/A	N/A	N/A	Both the three year and ten-year sales average trend, when compared to that of LAA2018 is down, though again this is not by a significant degree. Essentially importation of sands and gravel via railheads is largely remaining static.
Rail Depot Sales (Soft Sand)	6,477	6,451	6,686	⇩	⇧	0.006	N/A	N/A	N/A	The ten-year sales average trend, when compared to that of LAA2018 is down, though this is not by a significant degree. The three-year sales trend is very slightly up. Essentially importation of soft sand via railheads is static. What is more important to note is that importation of soft sands via rail heads is insignificant in comparison to Kent's land-won extraction.

Theoretical maximum wharf capacity is approx. 7.30mtpa according to the 2010 joint Medway and Kent study, while the recorded AM2019 survey capacity is reported as 5.80mtpa

2.38mtpa (estimated) compared to 0.50mtpa reported in 2017

Rail Depot Sales (Crushed Rock)	0.533Mt	0.391Mt	0.484Mt	⇧	⇧	0.40	N/A	N/A	N/A	The 10-year and three-year sales average are only very slightly higher than that reported in LAA2017, essentially importation via railheads of crushed rock is static.

Commentary

The secondary and recycled aggregates sector has significant productive capacity headroom to enable increased production. However, the contribution from recycled/secondary aggregate supply is essentially remaining static, at around the 0.75 to 1.0mtpa level. Given the history of stability of past sales, further take up of available capacity appears to be unlikely.

The land-won resource continues to be important for the supply of soft sand and hard rock (though imports of hard rock are showing signs of increase). The land-won sharp sand and gravels indicate a depleting resource. It is reducing in overall supply importance as demonstrated by the falling three-year sales averages; though (as reported in LAA2018) production has migrated over the administrative boundary (into East Sussex) and thus this observed trend, in all probability, does not reflect consumption of this primary land-won aggregate material in Kent. Though this sector of aggregate supply is not being replenished by new reserves.

Importation of marine dredged sand and gravel materials (via wharves) are increasing, as are the hard rock importation via wharves. Rail depot hard rock importation continues to increase and sand and gravel importation via railheads is also showing an increasing recent trend. Overall, it can be concluded that there appears to be a discernible shift away from land-won sharp sands and gravel supply with an increasing reliance on imports. The 27 plus year simple landbank is therefore unreliable given that consumption of this type of aggregate is, in all probability higher, being maintained by extraction that has moved over the administrative boundary into East Sussex. This effect, similarly, distorts the maintained NPPF 7-year landbank (calculated as 2.81mt). This being some 8.2 years as of end of 2018, only 1.2 years above the minimum requirement. Given the depressing effect of excluding Lydd Quarry sales in Kent, the maintained NPPF 7-year landbank would be probably at or below the maintained 7-year NPPF 'at least' requirement *if* Kent consumption of this material (from non-Kent reserves just over the border) were considered. No replenishment of reserves has occurred in 2018 and an overall diminishing resource base is recorded in Kent.

The soft sands land-won resource remains the dominant source of supply of this primary aggregate mineral type, marine-won importation is negligible. Current reserves (8.3mt) give a simple land bank based on a last year sales metric of 0.493mt gives 16.8 years. While the maintained 7-year NPPF landbank of 3.79mt, based on the LAA Rate of 0.542mt (the 10-year sales averages) and this will last for some 15.3 years as of the end of 2018. Further reserves will be required at the end of the adopted Plan period (2030 plus 7).

Hard rock imports are increasing, though the lack of data available from the land-won supply continues to make any valid comparison problematic. The LAA Rate is that which was used in the adopted plan at 0.78mtpa, this gives an estimated 30plus NPPF landbank life, well in excess of the 10-year minimum required.

Rail depot capacity was under reported in AM2017, and now more accurately reported as 2.38mtpa. This is significant, and ample headroom appears available to increase rail borne importation. Wharf importation capacity similarly retains its ability to increase as there have been no further wharf losses recorded in 2018, the available reported capacity of 5.80mtpa is below that of the maximum theoretical capacity of 7.30mtpa (as given by the joint Kent and Medway 2010 study). Safeguarding of all importation facilities will continue to be necessary to ensure a steady and adequate supply of aggregate materials to meet Kent's needs into the future.

Executive Summary

This is the seventh Local Aggregate Assessment Kent County Council has produced. It demonstrates that aggregate supply in Kent is provided by both imports and indigenous land-won materials. However, unlike the superficial sharp sands and gravels, soft sands are predominantly a land-won resource and this material cannot easily be substituted by recycled or secondary materials. It also appears that little can be expected in the short to medium term, from marine resources, in terms of supply. Therefore, Kent will likely remain a significant supplier of land-won soft sands to markets within and to an extent beyond Kent, into the future. However, the evidence strongly suggests superficial sharp sands and gravel deposits from the land-won resource are depleting. Here, there is correspondingly limited potential to meet NPPF landbank minimums into the future.

In the case of both soft sands and the sharp sands and gravel it is considered that the appropriate 'LAA rate' for Kent remains that of the recorded 10-year sales average. Any estimated increases above this figure are not easily derived due to the inherent limitations in demand modelling at the county council scale. Moreover, the use of the 10-year average as a main determinate for calculating landbanks and future aggregate requirements is in accordance with the National Planning Policy Framework (NPPF).

Hard rock supply from the land-won resource in Kent is significant. Though the actual levels are unable to be reported due to the need to maintain confidentiality.

Importation from marine resources for the sands and gravels and hard rock requirements is increasing as a share of the overall supply. Available wharf capacity is significant, though remains vulnerable to losses as their locations often coincide with competing regeneration initiatives. Growth predictions in housing and infrastructure delivery and maintenance are indicative at best. The inherent modelling limitations necessitates that only a likely upward trend in demand can be identified from the data available. Housing growth in Kent, based on the Kent local authorities objectively assessed needs are showing a potential 5% per annum growth to 2038. Irrespective of what level of growth occurs, it will necessitate a robust safeguarding regime if a steady and adequate supply of aggregates to meet the objectively assessed needs is to be maintained. Given the depletion seen with the sharp sands and gravels this will place an emphasis on importation infrastructure safeguarding in Kent.

The dashboard (pages iii to vi above) gives an overview of reserves, sales and the LAA Rates for the aggregate streams and the future ability of Kent to maintain an adequate and steady supply to meet need.

1. Introduction

1.1 The purpose of this Local Aggregate Assessment (LAA) report for 2019 is to detail the current and predicted situation in Kent with respect to all aspects of aggregate supply. It is based upon 2018 sales monitoring data. The National Planning Policy Framework (NPPF)[3] sets out the requirement for local authorities to produce an annual LAA, stating that: '*Minerals planning authorities should plan for a steady and adequate supply of aggregates by:*

> *a) preparing an annual Local Aggregate Assessment, either individually or jointly, to forecast future demand, 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)'*.

1.2 This is Kent's seventh LAA and it's fourth since the adoption of the Kent Minerals and Waste Local Plan 2013-30 (KMWLP or the Plan) in July 2016. The KMWLP provides the main strategic objectives for minerals (and waste) planning policy in Kent until 2030. Work on the Kent Mineral Sites Plan, to identify sites (one soft sand and two sharp sand and gravel sites) to deliver the adopted Plan's supply objectives was submitted for examination by an inspector appointed by the Secretary of State in 2019 and was the subject of a hearing in October 2019. Consultation has taken place on main and additional modifications to the Mineral Sites Plan and the Early Partial Review of the KMWLP and have been forwarded to the inspector for consideration in his final report, which is anticipated in the Spring of 2020.

1.3 Though the adopted Plan set out the quantities of aggregates to be provided over the period of the entire Plan, this inevitably will be subject to change as more recent monitoring data, as reported in the annual LAAs affects supply and demand. This monitoring data will be used to estimate the quantities required to maintain landbanks of 'at least 7 years' for sand and gravel and 'at least 10 years' for crushed rock at any one time in the Plan period. It is important to recognise that the data available to the County Council

[3] National Planning Policy Framework, paragraph 207 (DCLG, February 2019):

is that which represents past sales. The future predictions of need are based on this data and it will therefore be subject to variation, given that there are unknowns in terms of potential future permitted reserve re-evaluations and changes to production (sales) rates.

1.4 It is also important to note that the data used in the preparation of this report predominantly comes from the Annual Monitoring (AM) of aggregates sales by Kent County Council on behalf of the South East England Aggregate Working Party (SEEAWP). The AM survey collects annual sales data from operators of active mineral extraction sites, minerals wharves, minerals rail depots and recycled and secondary aggregate processing sites in the county. Where there are less than three operational sites supplying a particular type of mineral, as in the case of Kent's landwon hard rock quarries, commercial confidentiality prevents the reporting of sales or reserves.

2. Land Won Aggregate

Geology of Kent

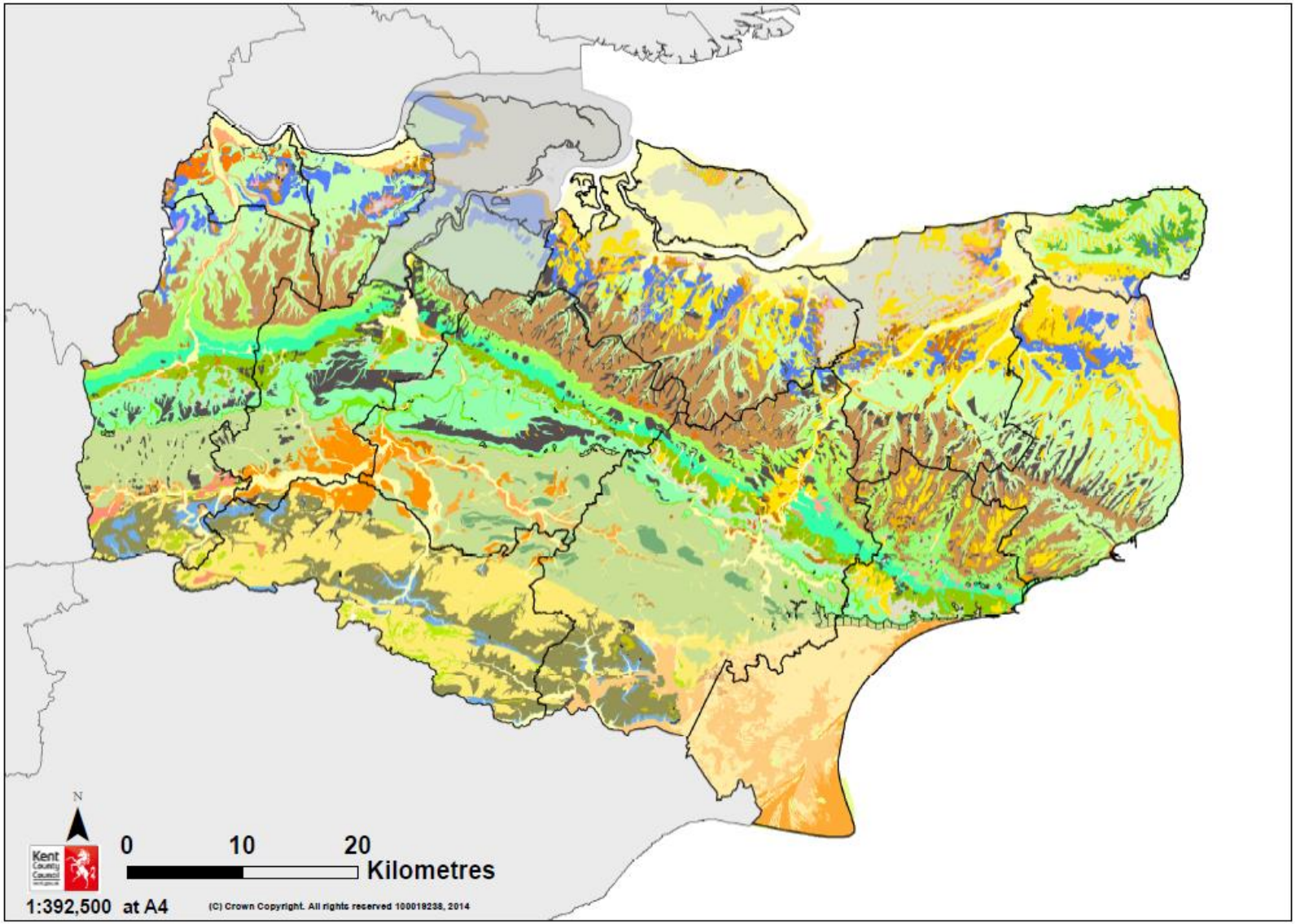
2.1 The geology of Kent is a complex array of solid crustal and superficial geological units that are generally well mapped and understood due to previous work by the British Geological Survey (BGS), see Figure 1. Kent has several economically important naturally occurring aggregate forming mineral deposits. The most recent of which is the post glacial (Pleistocene epoch of some 10,000 years ago) outwash (alluvial) river valley and terraced sand and gravels and storm beach sands and gravels (significantly, but not limited to, those found in the area around Lydd and the cuspate foreland of Dungeness). The extensive soft sand ancient beach deposit (the Folkestone Beds) are somewhat older, being part of the Lower Greensand Group of the Lower Cretaceous epoch (that are between 100-140 million years old).

2.2 Important deposits of hard rock are also present in Kent, in the form of a significant thickness of a complex estuarine limestone formation. This rock (Kentish Ragstone) can yield important building materials and when crushed it can be used as an aggregate. This material is also part of the Lower Greensand Group, forming part of what is called the Hythe Formation which was laid down prior to the Folkestone Formation, though still being within what is called the Lower Cretaceous epoch.

Permitted Sites Producing Aggregates in Kent

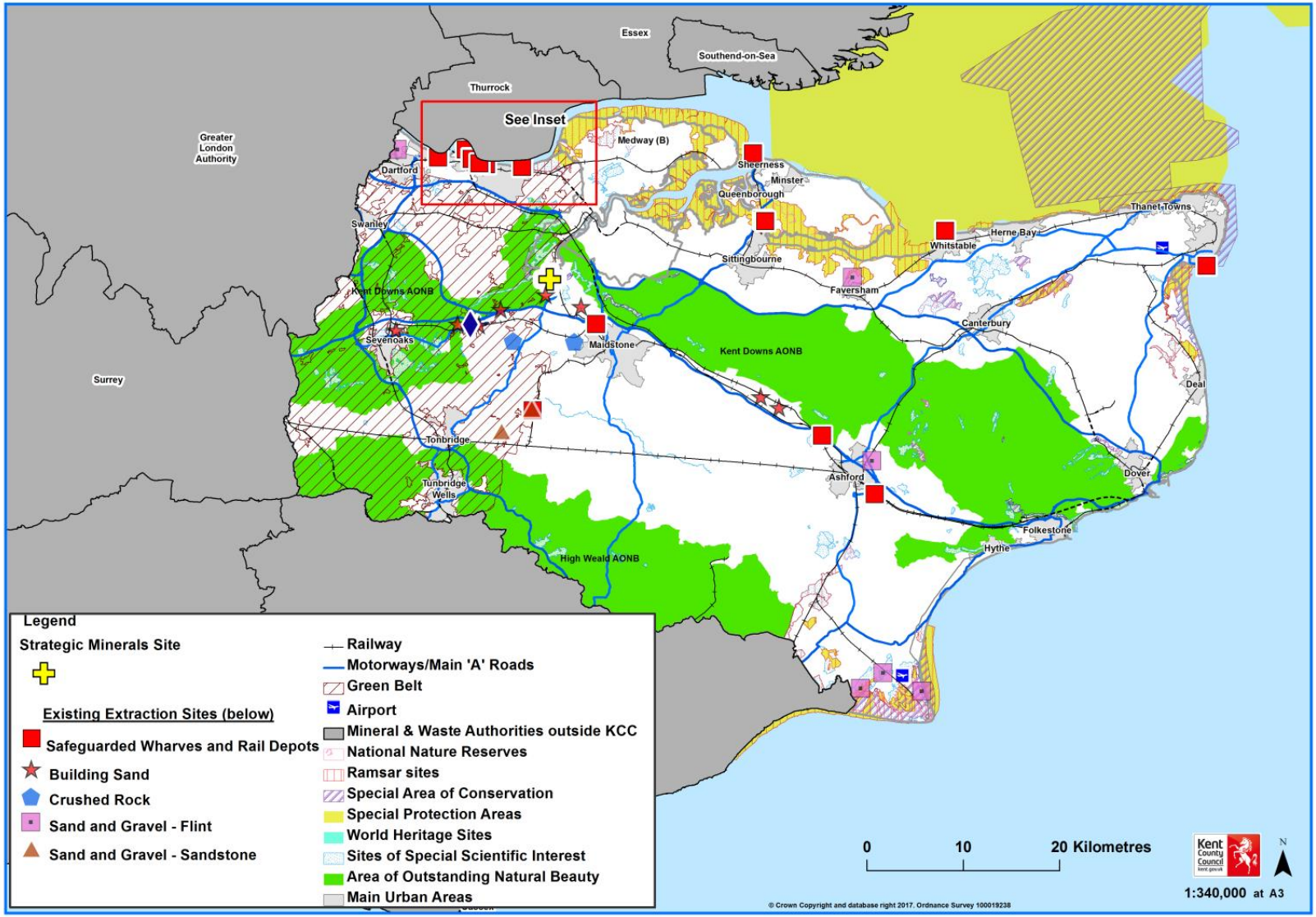
2.3 Historically much of Kent's landwon aggregate production has come from its main river valleys (they are the Medway, Great Stour and Darent) and the cuspate foreland at Lydd and Dungeness for sand and gravel supply. While the area around Maidstone has historically supplied much of the crushed hard rock materials. Soft (and silica) sand supply is associated with the Folkestone Formation, this significant unit traverses the county from east to west following the northern slopes of the Wealden basin. Figure 2 shows the location of the county's active quarries in in 2017 and the safeguarded mineral wharves and railheads that contribute to the supply of primary aggregates.

Figure 1: Geology of Kent both Solid and Superficial



Legend: Geology of Kent

Figure 2: Location of Active Quarries and Safeguarded Wharves and Rail Depots in 2018



2.4 Kent currently has two active hard rock quarries producing crushed rock aggregate from the Hythe Formation (Kent Ragstone), seven soft sand quarries winning material from the Folkestone Beds and ten sharp sand and gravel quarries. The latter are generally extracting materials from the river terrace deposits that are associated with the county's main river valleys, though the cuspate foreland (storm beach) deposits at Lydd and Dungeness also provide a source of supply. Table 1 overleaf details these sites.

Table 1: Permitted Quarries in Kent 2018

Site	Operator	*Sand & Gravel*	*Soft Sand*	Hard Rock	Status
Hermitage Quarry, Maidstone	Gallagher Aggregates Ltd	-	-	Yes	Active
Blaise Farm Quarry, West Malling	Hanson Aggregates Ltd	-	-	Yes	Active
Stone Castle Farm, Whetsted	*Lafarge Aggregates Ltd*	*Yes*	-	-	*Inactive*
Lydd Quarry, Lydd	Brett Aggregates Ltd	Yes	-	-	Active[4]
Allens Bank, Lydd	*Brett Aggregates Ltd*	*Yes*	-	-	*Inactive*
Conningbrook Quarry	*Brett Aggregates Ltd*	*Yes*	-	-	*Inactive*
Highstead Quarry, Chislet	*Brett Aggregates Ltd*	*Yes*	-	-	*Inactive*
Denge Quarry, Lydd	Cemex UK	Yes	-	-	Active
Darenth & Joyce Green Quarry, Dartford	J Clubb Ltd	Yes	-	-	Active
East Peckham Quarry, East Peckham	J Clubb Ltd	Yes	-	-	Active
Joyce Green Quarry, Dartford	*Ingrebourne Valley Ltd*	*Yes*	-	-	*Inactive*[5]
Aylesford Quarry, Aylesford	Aylesford Heritage Ltd	-	Yes	-	Active [6]
Addington Sand Pit (Wrotham Quarry)	Fern Aggregates	-	Yes	-	Active
Borough Green Sand Pit, Sevenoaks	Borough Green Sandpits Ltd	-	Yes	-	Active
Burleigh Farm, Charing	*Brett Aggregates Ltd*	-	*Yes*	-	*Inactive*[7]
Charing Quarry, Charring	*Brett Aggregates Ltd*	-	*Yes*	-	*Inactive*
Ightham sandpit (H&H Celcon)	*H&H Celcon*	-	*Yes*	-	*Inactive*
Lenham Quarry, Maidstone	Brett Aggregates Ltd	-	Yes	-	Active
Nepicar Sand Quarry, Wrotham	J Clubb Ltd	-	Yes	-	Active
Greatness Farm, Sevenoaks[8]	Tarmac Ltd	-	Yes	-	Active

[4] Extraction has moved into East Sussex, the processing of material and some reserves are within Kent

[5] Planning permissions to erect a new plan site and to extend the life of the extraction site until 2024 were granted planning permission subject to pre-commencement conditions in 2018

[6] No off-site sales in 2018 of soft sand though actively extracting a sand and gravel-based material (Hoggin) for construction fill purposes

[7] Inactive in 2018, early 2019 became active

[8] The site also produces sharp sand and gravel, though predominantly soft sands from the Folkestone Formation

Sand (Soft and Sharp) and Gravel and Hard Rock Production and Sales

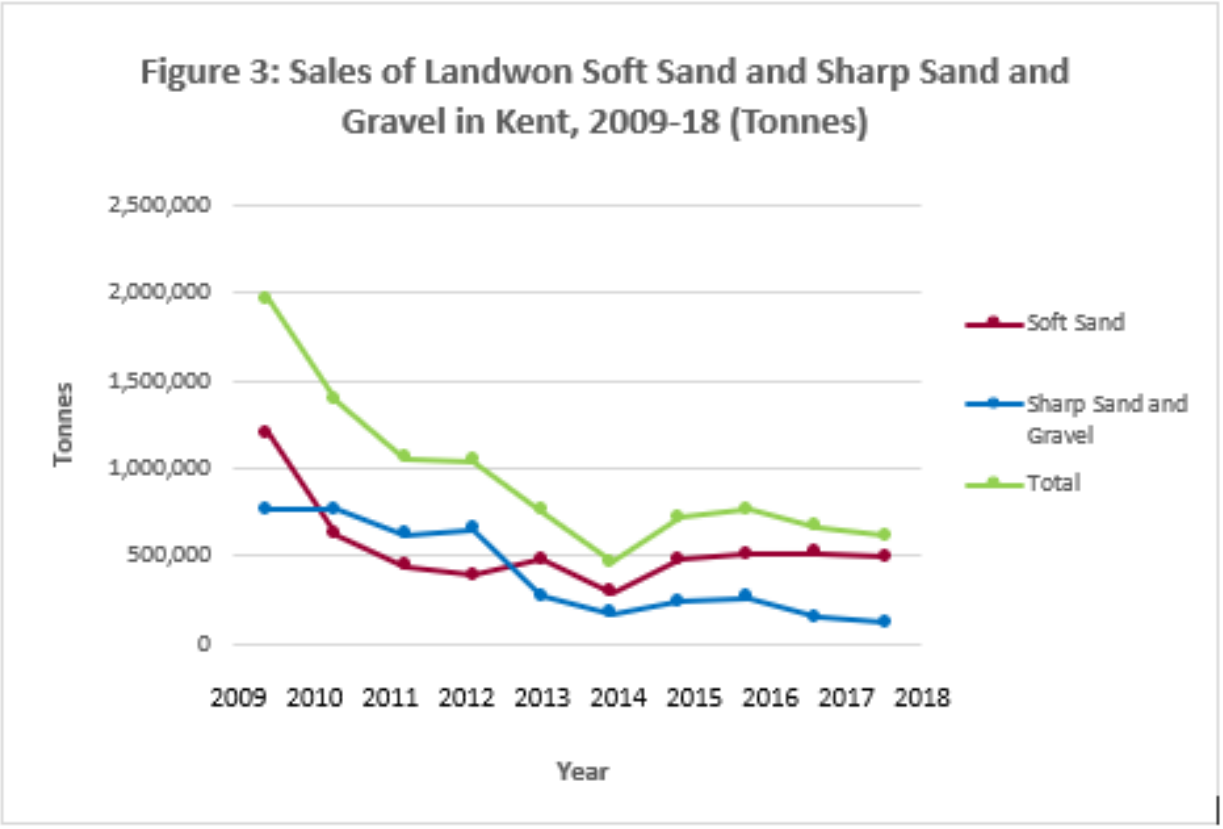
2.5 The sales of land-won sharp sand and gravel and soft sand in Kent since 2008 are shown in Table 2. The overall trend for both land-won aggregate types is an overall reduction in recorded sales, though this is significantly more pronounced for the sharp sand and gravels than the soft sands, as will be illustrated later.

Table 2: Landwon Soft Sand and Sharp Sand and Gravel Sales in Kent, 2009-2018 (Million tonnes)

Year	Tonnes
2009	1,963,044
2010	1,385,497
2011	1,058,764
2012	1,040,031
2013	756,000
2014	461,759
2015	719,581
2016	766,213
2017	670,579
2018	612,438
Last 3-year average (2016-18)	**718,396**
Last 10-year average (2009-18)	**980,163**

Source: Aggregate Monitoring Surveys, 2009-2018

Figure 3: Sales of landwon Soft Sand and Sharp Sand and Gravel 2009-18 (Tonnes)



2.6 Sales of hard rock are not represented here given the need to maintain confidentiality. The issue has not altered since the 2015 Independent Examination and subsequent adoption of the Kent Minerals and Waste Local Plan 2013-30 in 2016. The assumption of 0.78mtpa was, and continues to be, used as a proxy for hard rock sales in Kent. This figure originated from the apportionment for hard rock production in Kent from land-won resources in the South East Plan. The adopted Plan does not make any provision for additional hard rock reserves over the plan period, given the significant extent of the permitted reserves that still remain in the county at this time.

2.7 Figure 3 graphically represents the pattern of the land-won soft sand and sharp sand and gravel sales for the last ten years in Kent. Since 2015 sales have generally continued to show an upturn as demand increased from the low point in 2014 (0.461mt) and were at the 0.614mt level in 2018. Soft sand sales showed a marked peak in demand in 2009, when some 1.19mt was sold into the market (see Table 9 on page 32) and this then sharply declined in the following years with the lowest recorded sales in 2014 of 0.29mt. A fall of some 0.9mtpa in sales, though have been relatively stable around the 0.50+mtpa level since 2015. Sharp sand and gravel sales have shown a similar overall decline, although without the 'spike' in demand seen in 2009 for the soft sands. In 2007 sales were 0.83mt, this has declined to less than 0.50mt in 2012/13 and then has essentially remained in the 250,000 tonnes per annum range up to 2016. The sales in 2017 markedly fell to 0.151mt and in 2018 fell again to 0.119mt (the probable reasons for this decline will be discussed later in this report). There is no indication of a return to the 10-year average sales of around some 0.50mtpa.

2.8 Table 3 below shows the total current (2018 data) permitted landbank for the soft sands and sands and gravel landwon aggregates. The current adopted policy predicted requirements of these materials for Kent is set out in Policy CSM 2 of the adopted KMWLP Plan. This supply prediction was based on 2014 aggregate monitoring data, though the policy allows for adjustment when more recent data (in the form of LAAs are available). The emerging Mineral Sites Plan, in terms of overall potential resources in allocated sites, is based on the updated landbank requirement for both the soft sands and sharp sand and gravel over the remaining period of the Plan from 2019 until 2030 (plus 7 years).

2.9 The current sharp sand and gravel landbank based on local requirements is calculated at 4.23 years (based on Policy CSM 2 requirement for a 5.46mt as a 7 year maintained landbank), which is below the 7-year NPPF requirement of the adopted Plan's 10-year average of 0.78mt times 7 years (giving the 5.46mt). However, the recently monitored landbank (3.3mt) in 2018 when divided by the recent 10-year (2009-18) average sales data (used to define the LAA rate of 0.401mt) is sufficient for 8.2 years, that appears to be surpassing the NPPF requirements.

2.10 However, whatever the yearly drawdown figure is used it is considered that the landbank figures for the land-won sharp sands and gravels may well be demonstrating

a decline in available resources based on geological scarcity. New reserves that would replenish the landbank for this aggregate mineral are not coming 'on stream'. Output from one significant Kent quarry remains lost to the consideration of Kent's aggregate assessment due to extraction passing over an administrative boundary (Lydd Quarry). This may now be exerting a strong depressing effect on the sales average data not fully observed in previous LAA monitoring reports. Since this quarry remains currently active, the Kent share of its output is still being served. The Kent consumption of this material though, remains unrecorded by the AM process, that is restricted to sales where a mineral is raised. Therefore, the LAA Rate (0.401mtpa) for this material in Kent at this time is not fully reflective of the demand in Kent for land-won sharp sand and gravel. The LAA metric is probably too low giving an 'inflated' landbank of 8.2 years. However, given that the supply requirements estimation in adopted Policy CSM 2 is caveated with "…. *of at least seven years supply (5.46mt) will be maintained while resources allow*" this is not an unexpected conclusion. It is an acknowledgment of the geological scarcity of this type of aggregate deposit, coupled with material planning considerations that determine what level of resources can be sustainably allocated for future supply in plans, is below the NPPF requirements.

2.11 The potential for Kent to be able to provide any additional reserves of this aggregate type is a matter that is being addressed through the current Mineral Sites Plan process. The Independent Examination is ongoing at this time with main and additional modifications consultation responses having been sent to the Planning Inspector to enable his final report to be prepared. The Mineral Sites Plan identifies two sites for allocation, taken together (Moat Farm and Stonecastle Farm extension) will not provide sufficient future reserves to maintain an at least 7-year landbank over the Plan period. Alternatives, to this supply are anticipated to come significantly from (but not limited too) the marine dredged aggregate sector.

2.12 The soft sands permitted reserves have reduced to 8.30mt in 2018 due to continued production and the reduction of the 10-year average from 0.568mt in 2017 to 0.542mt in 2018. The available reserves of 15.3 years as at the end of 2018 when applying the 10-year averaged sales data (the LAA Rate) requirement calculation is meeting the NPPF's requirement to have a landbank of "*at least 7 years*". However, the adopted Plan requirement spans a greater time period and thus at that time (2016), the overall need was calculated at 15.60mt, with 5.0mt from new resources as sites allocated in the Mineral Sites Plan.

2.13 The Kent Mineral Sites Plan, was prepared to have an 18-year plan period (notionally 2019-30 plus 7 years) rather than the 24-year plan period of the adopted Plan (2013-30 plus 7 years). As a result, there is a need for a lower amount of new soft sand provision than the 5.0mt required by the adopted Plan policy. This reduced need has been informed by more recent aggregate monitoring data. Essentially enough soft sand will have to be provided to meet the identified need to maintain the NPPF's requirement of a "*steady and adequate supply of aggregates*" over the Mineral Sites

Plan period. This will be based on being able to meet at least the 10-year sales average per year (the LAA Rate) over the Mineral Sites Plan period. This is anticipated to come from the existing reserves currently permitted and available, with the identified shortfall being addressed by a new site at Chapel Farm, Lenham identified in the emerging Mineral Sites Plan. Various metrics have been considered by planning authorities and Kent County Council in the past to determine the appropriate LAA Rate to calculate need. However, modelling the effects of increased development rates identified in the county wide local plan coverage and the predicted number of infrastructure projects, are inherently difficult to do with any reliable accuracy. Considering this limitation, it is concluded that the 10-year average (the LAA Rate used by Kent represents a reliable metric) for landbank calculations for the Mineral Sites Plan period.

2.14 Table 3 below details the sharp sand and gravel and soft sand available reserves and landbanks that are derived from the AM2019 (2018 data).

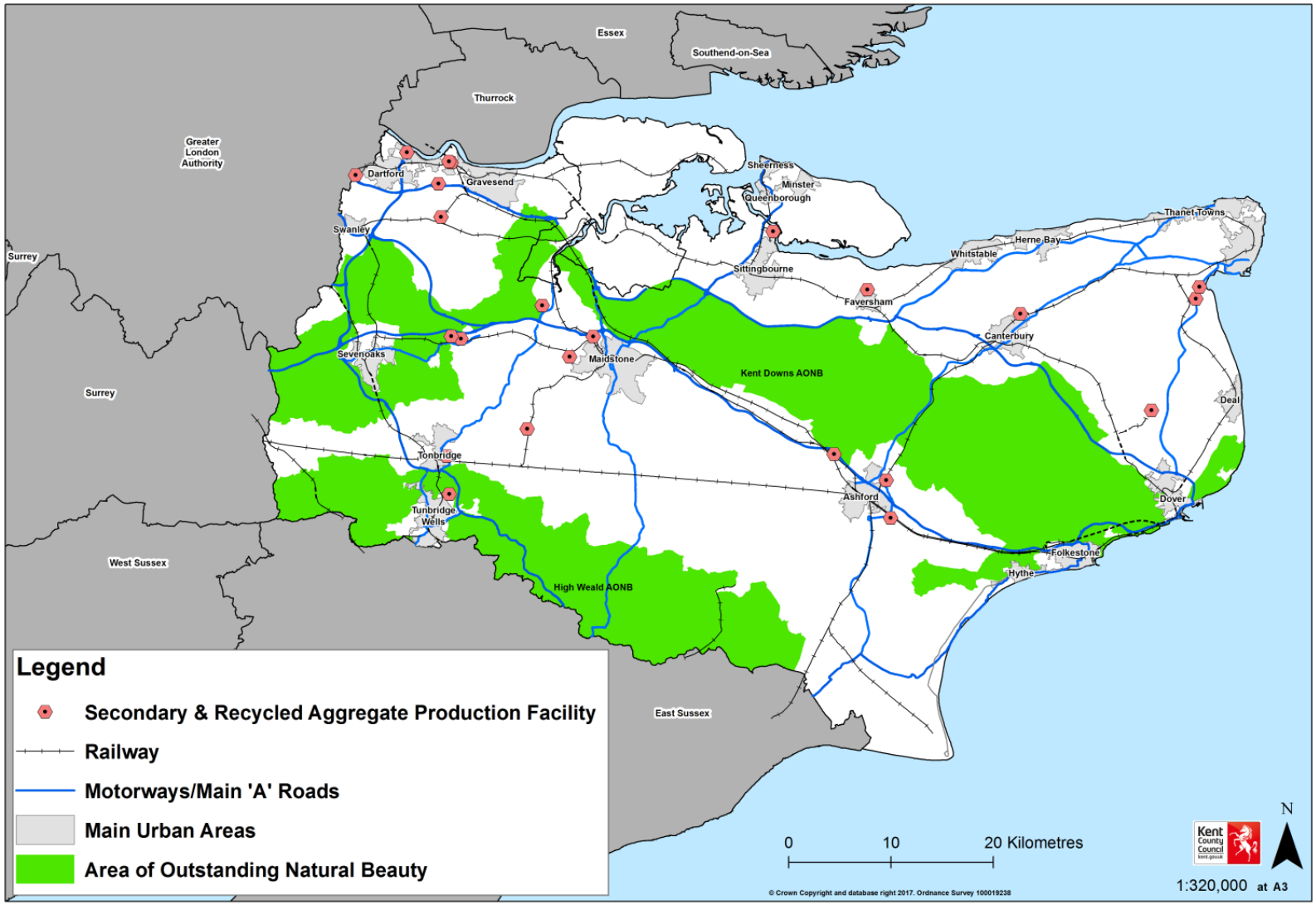
Table 3: Kent Aggregate Reserves and Aggregate Landbank as of 2018

	Permitted Reserve (mt) at end of 2018	Landbank based upon 10yr average sales (LAA Rate) between 2009-2018 (years)	Landbank based upon 3yr average sales between 2016-2018 (years)	Landbank based upon 2018 sales alone (years)
Soft Sand	8.3	8.3/0.542 = **15.3 years**	8.3/0.506 = **16.4 years**	8.3/0.493 = **16.8 years**
Sharp Sand & Gravel	3.3	3.3/0.401= **8.2 years**	3.3/0.177 = **18.64 years**	3.3/0.119 = **27.7 years**

3. Recycled/Secondary Aggregates

3.1 Data pertaining to sales of recycled or secondary aggregates is collected annually as part of the surveys carried out by Mineral Planning Authorities. Figure 4 shows the location of current active recycled sites in operation in Kent.

Figure 4: Location Map of Active Recycled and Secondary Aggregate Sites in Kent, 2018



3.2 The sales figures of the recycled and secondary aggregate in Kent are shown in Table 4 below. Kent has 22 currently active sites engaged in producing recycled aggregates from the construction, demolition and excavation waste stream and secondary aggregates from industrial by-products. As was the case for AM2018 a significant number of producers of secondary aggregate did not participate in the survey. As a result, the reported sales data is likely to be significantly lower than actual sales that have occurred in 2018. It is reasonable to assume that sales of materials from the recycled and secondary aggregate sector in Kent are over 1.0mtpa at this time. Overall the sector has an estimated reported productive capacity of 3.50mtpa for the recycled aggregates and 0.51mtpa for secondary aggregates giving a total of 4.01mtpa, a slight increase on the 3.90mtpa reported in LAA2019.

3.3 As a proportion of all non-imported aggregate sales (land-won hard rock assumed to be 0.78mt) in 2018, the recorded sales from the recycled and secondary sector amount to some 54.6% of the total annual production in the County of all types, primary and secondary/recycled combined. When considering all aggregate production, including the land-won, marine wharf and railhead imports (a total of 5.83mt recorded in 2018), the recycled and secondary sector amount to some 13%. This is a reduction to that recorded in AM2018 (2017 data) where the recycled and secondary aggregate share of the overall aggregate supply market was 14.9%. This reduction does not appear to be highly significant as the 0.76mt production in 2018 is not greatly different from that of the recorded 3-year average of 0.90mt. Continued monitoring will demonstrate if this sector is in any way displaying a trend of contraction in overall supply terms.

Table 4: Recycled and Secondary Aggregate Sales in Kent, 2009-2018 (Million tonnes)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	3-year average	10-year average
0.903	0.710	0.774	0.688	0.836	0.729	0.845	1.029	0.906	0.757	0.90	0.816

Source: Aggregate Monitoring Surveys, 2009-2018

4. Wharves (Marine-won Sand and Gravel)

4.1 Kent has 10 active and safeguarded wharves located on the coast of Kent, the locations of which are shown in figure 2 on page 13. There are a further two safeguarded wharves that are inactive at present - Sheerness, that is currently mothballed, and Old Sun Wharf at Gravesend that is being used as a concrete manufacturing and batching facility. The recorded loss of Dunkirk Jetty at the Western Docks, Dover (capacity in the range of 0.1 to 0.35 mtpa) in AM2016 has not been replaced.

4.2 The level of marine-won sand and gravel sales at wharves in Kent is shown in Table 5 overleaf.

Table 5: Marine Sand and Gravel Sales in Kent, 2009-2018 (Million tonnes)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	3-year average	10-year average
Sales	1.730	1.524	1.844	2.014	1.743	1.938	1.874	1.788	1.773	1.809	1.790	1.791

Source: Aggregate monitoring surveys, 2009-2018

4.3 Kent's wharf capacity (with the loss of Dunkirk Jetty) remains in the order of a theoretical 7.30mtpa. Imports via the wharves continues to remain essentially stable. The bulk of the sand and gravel imports being of marine dredged in origin with the ten-year and three-year sales averages being essentially similar in magnitude. Comparison to those reported in LAA2018, the previous ten-year average (2008 to 2017) was 1.790mt as opposed to the current 1.791mt, indicating a negligible change in sales. The three-year average in 2018 (using 2017 data) was 1.812mt; this has shown a modest decrease, and in 2018 the three-year average sales were 1.790mt, a negligible reduction. The apparent long-term trend is static, while in the shorter term a negligible decrease may be observable although it is probably of limited significance.

4.4 The marine deposits are mainly found in the English Channel and North Sea. These are defined sedimentary basins that are not being actively replenished by aggregate inputs, though they have a significant but finite, resource. The Crown Estate are responsible for licensing extraction from the seabed. It stated in 2012 (to the then Mineral Sites Plan, Preferred Options Consultation May 2012) the following:

- *Over 900 million tonnes of marine sand and gravel (aggregate) has been dredged from offshore seabed over the last 50 years and at least 1,250 million tonnes is available for sustainable supply of construction aggregate over the next 50 years and beyond. Currently marine sand and gravel supply some 20% of the county's demand.*

- *The marine aggregate resource available in the East Coast, Thames Estuary and East English Channel areas and which are used to supply Kent wharves is 994 million tonnes of which 31.25 million tonnes is permitted for extraction per annum. Kent wharves only received some 1.3 million tonnes (4.2% of total permitted per annum) in 2010 but increased in 2011 with 1.55 million tonnes (5%). There is therefore a long term viable and sustainable supply of marine dredged aggregate both for construction uses and for direct beach nourishment by vessel delivery.*

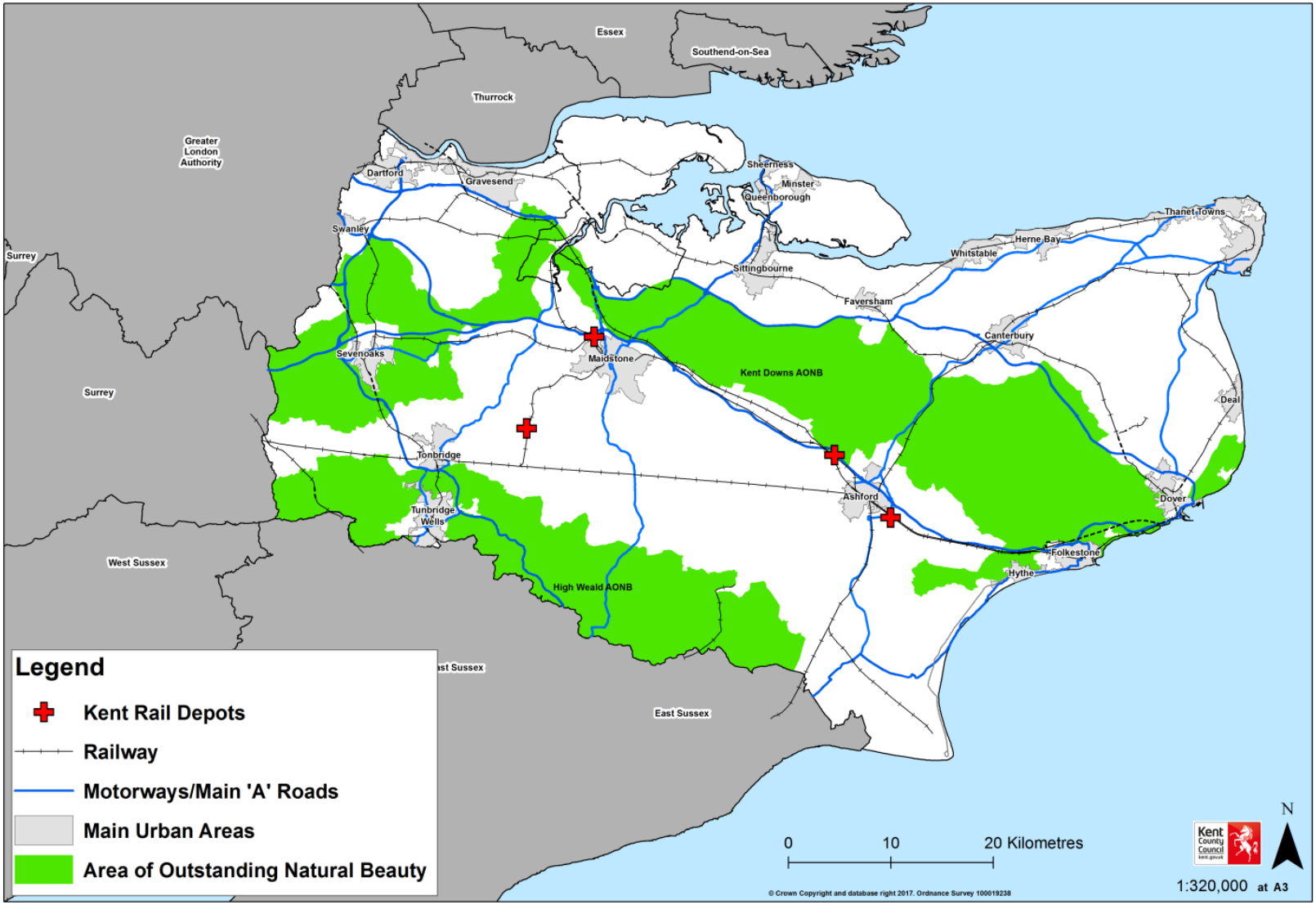
- *The current rate of extraction by all companies to all marine aggregate wharves in the UK and on the European mainland is some 45% of the quantities permitted per annum thus reinforcing the sustainability and long-term viability and requirement of marine aggregate wharves in Kent.*

4.5 The area of the overall resource that supplies Kent, was estimated as 99mt in 2011, and is probably in the order of 91mt as of 2018 given the recorded landings in previous aggregate monitoring returns.

5. Crushed Rock

5.1 Kent has natural hard rock resources in the form of the Hythe Formation (Kentish Ragstone) that has traditionally been quarried in the Maidstone area, though not exclusively historically. Given that there are only two active sites in Kent, confidentiality prevents a detailed report of sales in 2018. The proxy of 0.78mtpa has been used in past LAAs and during the formulation and examination of the adopted KMWLP Plan. There are no compelling grounds to depart from this proxy for the landwon fraction of hard rock supply in Kent. The current reserves were significantly boosted by the addition of planning permission for 16 million tonnes of ragstone (Hythe Formation limestone) in a westerly extension of Hermitage Quarry close to Maidstone in 2013. This material, in addition to reserves currently available at Blaise Farm Quarry are considered sufficient to more than meet the NPPF requirement of an at least 10 years hard rock landbank in Kent. In addition, there are substantial quantities of hard rock importation via wharves and railheads. Figure 2 on page 13 above shows (amongst other features) the safeguarded wharves and rail depots, Figure 5 on page 25 shows the railhead distribution only, for ease of clarity.

Figure 5: Location Map of Active Rail Depots in Kent, 2018



5.2 The crushed rock sales (from rail and sea imports) in Kent in 2018 were 1.58mt overall. In 2017 the sales amounted to 1.53mt. The 10-year average is lower, while the three-year average of 1.54mt is closer to current production indicating a substantial upturn in crushed rock imports into Kent. This is illustrated in Table 6 below shows the total aggregate (of all primary types) importation into Kent since 2009 until 2018.

Table 6: Aggregate Sales from Rail Depots and Wharves in Kent, 2009-2018 (Million tonnes) including land-won and marine dredged materials in aggregated totals

Year	Soft Sands	Sharp Sands and Gravel	Crushed Rock	Totals
2009	0.0150	1.76	1.02	**2.80**
2010	0.0182	1.67	1.01	**3.23**
2011	0.0160	2.01	1.17	**2.89**
2012	0.0230	2.18	0.70	**2.91**
2013	0.0152	1.77	0.87	**2.66**
2014	0.0098	1.97	1.07	**3.05**
2015	0.0288	2.06	1.38	**3.50**
2016	0.0079	2.05	1.50	**3.56**
2017	0.0083	1.82	1.53	**2.85**
2018	0.0310	1.87	1.58	**3.48**
Last 3-year average	**0.0150**	**1.92**	**1.54**	**3.20**
Last 10-year average	**0.0173**	**1.916**	**1.18**	**3.05**

Source: Aggregate Monitoring Surveys, 2008-2018

6. Total Aggregate Production in Kent in 2009-2018

6.1 During 2018 the total primary and recycled/secondary aggregate production (sales) (including imports) in Kent are shown on Table 7 below.

Table 7: Total Aggregate Production in Kent during 2009-2018 (Million tonnes)

Year	Soft Sands Land-won £	Soft Sands Imports	Sharp Sands & Gravel Land-won £	Sharp Sands & Gravel Imports $	Crushed Rock landwon	Crushed Rock Imports	Secondary/ Recycled Aggregates	Total
2009	1.20	0.0150	0.76	1.76	0.78	1.02	0.90	**6.43**
2010	0.62	0.0182	0.76	1.67	0.78	1.01	0.71	**5.57**
2011	0.44	0.0160	0.62	2.01	0.78	1.17	0.77	**5.85**
2012	0.39	0.0230	0.65	2.18	0.78	0.70	0.67	**5.40**
2013	0.48	0.0152	0.27	1.77	0.78	0.87	0.84	**5.00**
2014	0.29	0.0098	0.17	1.97	0.78	1.07	0.73	**5.02**
2015	0.48	0.0288	0.24	2.06	0.78	1.38	0.84	**5.77**
2016	0.51	0.0079	0.26	2.05	0.78	1.50	1.03	**6.14**
2017	0.52	0.0098	0.15	2.19	0.78	1.53	0.91	**6.09**
2018	0.49	0.0326	0.12	2.07	0.78	1.58	0.76	**5.83**
Total 2009-18	**5.42**	**0.1763**	**4.00**	**19.73**	**7.80**	**11.83**	**8.16**	**10-year average 5.71mt**
Last 3-year average	**0.506**	**0.0167**	**0.1766**	**2.103**	**0.78**	**1.536**	**0.90**	**3-year average 6.02mt**
Last 10-year average	**0.542**	**0.0176**	**0.400**	**1.973**	0.78	**1.183**	**0.816**	

Source: Aggregate Monitoring Surveys, 2008-2018. $ denotes marine dredged and landwon sands and gravels via railheads and wharves. £ denotes any sales for constructional fill not included.

6.2 The data in Table 7 does not demonstrate actual consumption of aggregates within Kent from 2008 to 2018, as a degree of exportation out of Kent has occurred in the same period. In addition, importation by road is not picked up by the most AM surveys. Import and export balance survey work that can reveal the degree of aggregate consumption (to a reasonable degree of accuracy) was last completed in a comprehensive form in 2009. Given the elapse of time (11 years) it would not be reasonable to place much reliance on the findings of AM2009 for future planning requirements. Further work on this matter was commissioned in 2014. Whilst the data is unpublished, it is available from the British Geological Survey. It shows that Kent consumes 80-90% of all the aggregate produced in Kent (both as land-won and the imports of sand and gravel and crushed rock) and 10-20% of materials were exported to the wider South East in 2014. The data does not disaggregate between soft sand

and sharp sands and gravels and thus has limitations in how it can be used to determine what is happening with these different materials serving distinctly different markets. However, due to the relative scarcity of sharp and gravel reserves in Kent it is highly likely that exports of soft sand exceed those of any exports of land won sharp sand and gravel. Although it is known that the output from Scotney Court Quarry (alternately known as Lydd Quarry) at Lydd serves both the Kent and East Sussex markets for high quality storm beach flint sand and gravels, at an anticipated ratio of 50:50.

6.3 The sales collated figures show that sharp sands and gravel from the landwon sector have continued to maintain the observed pattern of decline. Further exacerbated by all the production at Scotney Court Quarry moving into East Sussex and the sales not being recordable as Kent sales in any quantity, though it is still serving the Kent market. Imports of sharp sands and gravels (from marine and other landwon sources) have shown a very slight decrease, as have sales of landwon soft sands. Though these imports are increasing, this is a very minor sector of overall Kent aggregate supply, particularly with regard to marine dredged soft sands. Either the resources is not extensive, or the dredging technology is not developed to fully exploit the resource or the industry is reluctant to invest in this area given the uncertainty of its potential and the costs involved while there are relatively abundant land-won resources available in the south east.

6.4 Secondary and recycled aggregates have fallen back again from 2017 sales figures (0.91mtpa) and are now appreciably below the high 1.03mtpa mark seen in 2016 (at 0.76mtpa in 2018). Imports of crushed rock are increasing from 1.53mtpa in 2017 to 1.58mtpa in 2018. Total aggregate sales in 2018 at 5.83mt, which is 4.3% below that recorded in 2017. However, it is the case that taken in the context of the last 10 years the overall aggregate sales remain stable, in that they are above the 10-year average of 5.71mt by only some 2%. This indicates an overall stability in the pattern of total aggregates sales through time. The individual sectors are showing change.

7. Future Aggregate Supply

7.1 The housing targets and infrastructure projects anticipated until 2030, as reported in LAA2019 require updating, are shown on Table 8 below.

Table 8: Levels of Planned Housing and Infrastructure in Kent excluding Medway

Demand Generation	Approximate Timelines		
Dwellings	In LAA2018 it was reported that in Kent 178,600 additional homes between 2011-2031 or 8,930 per annum (this is based on 2014 ONS data, would be required In addition the Ebbsfleet Garden City (a planned development of up to 15,000 homes and 45,000m^2 of commercial floor space) would also place demand on aggregate material supply. This figure has been revised by Kent County Council, which has produced a 'Housing Trajectory' based on information provided by each local authority in Kent in November 2019. It concludes that there is to be 217,030 dwellings built between 2018 and 2038 in Kent and Medway. Kent alone would require 187,200. This averages out at: • 9,360 per annum 2018-38 in Kent; • This gives (between 2020-30 [plus 7]) 159,120 dwellings over the Plan period. Taking Kent and Ebbsfleet Development Corporation together gives a total of 174,120 new dwellings until 2020-30 [plus 7]. The previous LAA looked at housing growth until 2011-31 only. Therefore, it is not a direct comparator, however when comparing the earlier housing growth per annum growth prediction (based on 2014 ONS data) to the new per annum growth prediction (based on a Kent wide Local Plan coverage) there is a 4.6% increase in housing need per annum.		
Education	2020-24 Primary 12.8 FE[9] Secondary 58 FE	2024-28 Primary 26.6 FE Secondary 21 FE	2028-30 Primary 11 FE Secondary 8 FE
Significant Infrastructure	Up to 2030 in Kent A2 Bean and Ebbsfleet Junctions		

[9] FE denotes Form Entry

	Lower Thames Crossing Bifurcation of Port Traffic and Ports Expansion (Dover significantly, including potentially Large Local Major (LLM) funding schemes for A229 Solution to Operation Stack and Overnight Lorry Parking Rail improvements to Thanet

7.2 The planned level of dwellings has increased since LAA2018, an estimated 178,600 homes 2011-2031 of the earlier prediction has been revised to 187,200 dwellings required between 2018 and 2038 (just beyond the Mineral Sites Plan of 2030 plus 7). A 4.6% per annum increase in Kent housing requirement, additionally the Ebbsfleet Garden City (a planned development) would add an additional 15,000 homes to the overall total. While this represents an increase, that will require an increase in aggregate supply, the overall magnitude of housing growth compared to previous monitoring periods is not markedly different.

7.3 The demand projections in infrastructural development, as reported in LAA2018 have not significantly altered. They include port expansion, east Kent rail connections and major highway schemes (A2 junction improvements) additional to the planned Lower Thames Crossing. The potential London Resort development area is identified in the emerging Dartford Local Plan (Issues and Options) consultation of January 2020 for mixed use and an ecological improvement area. Arguably this change would result in lower aggregate demand. As stated in pervious LAA monitoring reports, infrastructure maintenance would have to be commensurate with needs to maintain the network and ensure new schemes coming on stream by 2030-32 are also integrated and maintained.

7.4 The demand for aggregates in Kent for house building and concrete products for infrastructure and major projects is showing an increasing trend (given the continued upturn in the last three years sales averages of land-won building sands, marine dredged sands and gravels and railhead and wharf imported crushed rock). Though there are no obvious indications that this trend will reverse, overall sales dropped slightly from 6.09mt in 2017 to 5.83mt in 2018, though the removal of Lydd Quarry's output from the sales data is no doubt continuing to have a skewing effect on how the data can be interpreted. This is giving rise to an overall underestimation. Any impact of Brexit will likely become apparent in LAA2021 or LAA2022 when the transition period has elapsed.

7.5 However, it is considered that modelling the actual quantum of demand from this growth upturn is unreliable at the county council scale. With emphasis on the last three years of monitored sales data. It is considered that the use of the latest 10-year sales averages are the most reliable metric for considering demand over the emerging Mineral Sites Plan period, as this will continue to average out the inevitable fluctuations in overall supply that has and will occur. Whatever the metric used to identify a level of supply, it is the availability of replenishing resources (that appear now limited in the land-won sand and gravel sector) that will be the significant determinant of how land-won resources can respond to any objectively identified need.

Available Reserves or Landbanks

7.6 The 2018 data (AM2019) collected for Kent shows the reserves for the following aggregate mineral types *as of the end* of 2018:

- Soft sand 8,296,344 tonnes or 8.30 million tonnes
- Sharp sands and gravel 3,286,500 tonnes or 3.30 million tonnes
- Hard rock – confidential but significant planning permission for an additional 16 million tonnes was granted in 2013.

7.7 These reserves are the estimates of all the respective aggregate mineral sites (soft sand, sharp and gravel, hard rock) operating in Kent for the end of 2018. Therefore, it is recognised that the data in early 2020 needs to be recast to reflect another year of production. The magnitude of which will not be known until the data for 2019 is collected by AM2019 in 2020. In the meantime, reserves can be approximated for planning policy formulation purposes and determining planning applications and appeals by further reducing reserves by assuming at least the most recently recorded sales figures and the last 10-year averages prior to collation of more recent data.

Soft Sands

7.8 With regard to the soft sands, the 2009-2018 ten-year average is 541,907 tonnes per annum, this is down by 4.57% from that reported in LAA2018. Though the three-year trend is continuing to display an upturn, as this has increased from 502,097 tonnes per annum in 2017 to 506,419 tonnes per annum in 2018. The 10-year average (Kent's LAA Rate) gives a landbank of 15.31 years based on a reserve of 8.3 million tonnes. In simple terms this would give a 16.8-year landbank based on 2018 sales. The recorded sales since 2006 are shown on Table 9 below.

7.9 Soft sand sales in 2018 were 493,416 tonnes, down very slightly from the 519,414 tonnes recorded in 2017. The important point to note is that the upturn from the low sales of 289,087 tonnes recorded in 2014, first noticed in 2015-16 appears to be levelling off at the 0.5mtpa mark. Though growth in sales can be reasonably anticipated, given the potential for an increase in construction demand as discussed above (the approximate 5% per annum housing requirement increase) future

monitoring will reveal if this works its way into Kent's soft sand sales in any meaningful way.

Table 9: Landwon Aggregates Sales - Soft Sands 2009-18

Year	Tonnes
2009	1,199,120
2010	621,573
2011	438,909
2012	387,746
2013	483,165
2014	289,087
2015	480,215
2016	506,663
2017	519,414
2018	493,179
Average last 10-years (2009-18)	**506,416**
Average last 3-years (2016-18)	**541907**

Sharp Sands and Gravel

7.10 The marked fall in overall reserves from 3,791,880 tonnes to 2,715,708 tonnes observed in 2016 was largely reversed in 2017. This was due to confirmation of available reserves of the sharp sands and gravels at a specific site which had previously raised concern regarding the degree to which it had a soft sand component. On re-evaluation, the ratio of soft sand to sharp sand and gravel was found to be zero. As a result, the recorded reserves at the end of 2017 were 3,695,500 tonnes - a form of 'recovery' of the landbank from the 2016 low of 2.7mt. In 2018 there was no further replenishment in the form of additional planning permissions. Correspondingly available reserves are declining again, and at the end of 2018 some 3,286,500 tonnes remain.

7.11 Recorded sales in 2016 were 259,550 tonnes, in 2017 they markedly fell to 151,165 tonnes. The ten-year average sales of 571,568 tonnes recorded in 2016 has dropped to 472,303 tonnes in 2017. In 2018 recorded Kent sales fell again to a new low point of 119,259. The sharp sand and gravel landbank based on the last 10-year sales (the Kent LAA Rate) average is currently 8.2 years. Table 10 below shows recorded tonnages of sales since 2006-18.

Table 10: Landwon Aggregates Sales Sharp Sands and Gravels 2009-18

Year	Tonnes
2009	764,000
2010	763,924

2011	619,855
2012	652,285
2013	273,000
2014	172,672
2015	239,366
2016	259,550
2017	151,165
2018	119,259
Average last 10-years (2009-18)	**401,508**
Average last 3-years (2016-18)	**176,658**

Hard Rock

7.12 Hard rock sales remain restricted given that Kent production from the landwon resource is represented by only two sites. This falls below the minimum three required by agreement with the South East Aggregate Working Party (SEEAWP) that would allow the reporting of sales per year. Therefore, the current landbank is estimated using the adopted Plan's proxy for yearly sales, that being 0.78 million tonnes. Thus, gives a ten-year average of the same figure. The 10-year landbank requirement remains 7.8 million tonnes.

7.13 The hard rock permitted landbank remains confidential, in LAA2016 it was estimated at over 48 million tonnes. Given another 3 years of assumed production at 0.78 million tonnes the estimated landbank may be some 45.66 million tonnes available at Hermitage Quarry and Blaise Farm Quarry combined. Whatever the correct level of workable reserves that are presently available, it is a reasonable conclusion that they are significantly greater than 7.8 million tonnes this being the NPPF 10-year landbank requirement, or the adopted Plan's requirement of at least 20.5 million tonnes from the existing permitted resources.

Future Potential Resources

7.14 The County Council continued to progress work on a Mineral Sites Plan, as required by the adopted Plan, to identify the required future resources to ensure a steady and adequate supply of minerals until 2030. The Call for Sites exercise in late 2016 into early 2017 resulted in several sites including those containing aggregates and other mineral types coming forward. The County Council initially assessed the sites promoted that accord with the objectives of the adopted Plan. This exercise identified those sites that could go forward to a Mineral Sites Plan Options (Regulation 18) public consultation (19th December 2017 to 29th March 2018).

7.15 The nine sites that were part of the Regulation 18 Options consultation (two for soft sands and seven for sand and gravels, as set out on Table 11 below) were then subject to a Detailed Technical Assessment process. The findings of which informed the Pre-

submission Mineral Sites Plan Regulation 19 publication and consultation in early 2019. Three sites were subsequently allocated in the Submission Kent Mineral Sites Plan in 2019.

Table 11: Mineral Sites Plan (Regulation 19 stage) Sites for Land-won Aggregates

Site	Amount (mt)	Aggregate	Proposed Allocation in Kent Mineral Sites Plan
Chapel Farm, Lenham	3.2	Soft sand	Yes
West Malling Sandpit, Ryarsh	3.1	Soft Sand (and 0.5mt of Silica sand)	No
Central Road, Dartford	0.9	Sand and Gravel	No
Joyce green Quarry, Dartford	1.5	Sand and Gravel	No
Lydd Quarry and Allen's Bank Extension, Lydd	3.1	Sand and Gravel	No
Moat Farm, Five Oak Green, Capel	1.5	Sand and Gravel	Yes
Postern Meadows, Tonbridge	0.23	Sand and Gravel	No
Stone Castle Farm Quarry Extension, Hadlow/Whetsted	1.0	Sand and Gravel	Yes
The Postern, Capel	0.5	Sand and Gravel	No

Source: http://mylimehouse.kent.gov.uk/portal/

7.16 The Mineral Sites Plan was subjected to Independent Examination Hearings by an Inspector of the Planning Inspectorate during October 2019. A number of Main and Additional Modifications were promoted and consulted[10].upon as part of the Mineral Sites Plan examination. The Plan was not modified to include any additional sites or any further reduction in sites from the three allocations proposed as shown on Table 11 above. The Inspector's report is anticipated to be with the County Council in the Spring of 2020. Given that the potential sites are yet to be fully determined (in terms of deliverability and full economic potential) at the time of writing significant weight cannot be attached as to whether these sites that would act as replenishments to the respective aggregate landbanks.

7.17 It is recognised that the 3.3 million tonnes landbank for sharp sands is over the NPPF 7 year minimum (this being 2.81 million tonnes based on a ten-year average of 0.401 million tonnes) remains essentially artificial. The fall in sales since 2016 is significantly due to the production of a notable site moving over the Kent administrative boundary into East Sussex. Production has continued and serves both a Kent and East Sussex market. Moreover, the requirement for the Mineral Sites Plan period to 2030+7 is 5.75mt; based upon 2017 data on available reserves and the LAA Rate in 2018. Therefore, it remains the case that the need to plan for additional resources is justified. It should also be noted that the requirements of the adopted Kent Minerals and Waste Plan (Policy CSM 2), that are to be addressed in the Kent Mineral Sites Plan require

[10] https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/planning-policies/minerals-and-waste-planning-policy#tab-2

significantly greater quantities of sharp sand and gravel aggregates *"…while resources allow*." This being due to the recognition that the land-won sands and gravels are a depleting resource in Kent. Therefore, an additional 2.5 million tonnes (two sites) are allocated in the Plan, and the remaining shortfall is to be made from alternative resources such as secondary and recycled material and marine dredged supply. The reasons for non-allocation of all the promoted Option sites including those promoting sharp sand and gravel are detailed in the Mineral Sites Plan-Site Assessment Document (document ref. KCC/SP41) found in the Submission Documents (May 3 May 2019) of the Examination Documents Library[11].

7.18 In regard of the soft sand requirements, the existing reserves, while substantial (8.3 million tonnes in 2018) are insufficient for the Mineral Sites Plan period (up to 2030+7). The need to maintain a 7-year landbank requires 2.5 million tonnes of additional reserves over the plan period. Therefore, the additional 3.2 million tonnes of the allocation site (Chapel Farm, Lenham) would meet the requirement of the Mineral Sites Plan and yield a surplus that could be used if demand significantly changes or demand from other areas where the resources are potentially more constrained. This surplus was calculated as 0.70 million tonnes. Using the 2018 data from the AM2019 monitoring exercise this surplus has increased to 1.2 million tonnes. This is due to the reduction in the 10-year sales average from 0.568 to 0.542 million tonnes per annum.

7.19 In addition to the maintenance of landwon aggregate landbanks to support a steady future supply of aggregate minerals in Kent, Policy CSM 8 of the adopted Kent Minerals and Waste Local Plan 2013-30, states that sites will be identified in a Mineral Sites Plan to produce recycled and secondary aggregates to ensure a processing capacity of at least 2 million tonnes to maximise the availability of alternatives to marine-won and local land-won primary sand and gravel extraction. Current capacity of production in this sector is some 4 mtpa (0.2 mtpa less than that reported in 2017). Additional sites were therefore not needed to meet the adopted Plan's policy requirements and no sites were identified for allocation in the Pre-Submission Mineral Sites Plan.

Productive Capacity

7.20 The monitoring in 2019 (AM2019 to gather 2018 data) included productive capacity, this was first done was in 2016. The understanding of capability of sites, through capacity, is a tool to be used to assist planning for future changes in demand. The results of the last two years of capacity monitoring are shown in Table 12.

7.21 This is the third year this type of information was collected. When comparing the most recent data to that of the previous year monitoring data (in LAA2018, 2017 data) it shows that the capacities for both wharf and railhead importation were inaccurate.

[11] https://consult.kent.gov.uk/portal/second_call_for_sites_2016/document_library

However, the exercise in comparing sales with capacity can demonstrate underutilised or 'void' productive capacity currently in Kent. This is useful for indicating the degree of headroom available for expansion in importation.

7.22 Table 12 indicates that for land-won soft sand aggregate supply, sales represented 58% of the permitted productive capacity in 2017. This is a drop from the recorded LAA2017 (2016 data) figure of 75%. In 2018, this has fallen again to 53.6%. For the land-won sharp sands and gravels the 'voided' capacity is significant, as the productive capacity is now recorded as 1.1 mtpa, and the utilisation of this capacity is only 10.35% (a reduction from 14% in 2017). This being a consequence of the recorded sales having fallen in Kent again (this effect includes the migration of productive area across the administrative boundary of Kent into East Sussex in 2015 this was first reflected in the data collected in AM2016). Therefore, the continued reduction of sales is a very possible reflection of overall retraction of the land-won sector of sharp sand and gravel supply.

7.23 With regard to recycled and secondary aggregate production there is significant available capacity headroom. The recorded productive capacity has grown from 3.90mtpa as reported in LAA2017 (2016 data) to 4.18mtpa in 2017, though in 2018 there is a recorded reduction to 3.55mtpa. However, capacity headroom remains significant. There is potential to provide an additional 2.79mtpa secondary and recycled aggregates over the current demand of some 0.756 million recorded tonnes.

7.24 Kent's wharves are being more intensively used. The productive capacity was recorded as 7.30mtpa in earlier LAAs was based upon the joint Kent and Medway importation study of 2010. This was a theoretical capacity. The AM2019 (2018 data) monitoring gave a lower, but possibly more accurate figure of 5.80mtpa. Therefore, as of 2018, available additional capacity remains significant (at 53.6%). This is in contrast to the very significant degree of headroom reported in LAA2017 (that applied the overall capacity figure of the 2010 study), when there was an apparent 75% additional capacity, due to the theoretical total capacity was considered as 7.30mtpa. Rail depots were reported as operating at full capacity with sales matching the recorded productive capacity in LAA2018 (2017 data) this being some 500,000tpa. This was in all probability inaccurate, in light of the more recent AM2019 monitoring data that gives 2.38mtpa as overall capacity at the end of 2018. Therefore, the rail depots have significantly greater unused capacity than previously concluded, in the region of 76%. Like the wharves in Kent, there is significant available headroom for expansion of rail importation of aggregates.

Table 12: Total Sales and Estimated Production Capacity, 2017 and 2018 (million tonnes per annum)

For year 2017	Sales (mt)	Productive Capacity (mtpa)	% Sales/ Production
Land-won Aggregate			
• *Soft Sands*	0.519	0.89	58%
• *Sharp Sands and Gravels*	0.151	1.10	14%
Wharves	3.075	7.30	42%
Rail Depots	0.501	0.50[12]	100%
Recycling/Secondary	0.906	4.18	22%

Source: Aggregate Monitoring Survey, 2017 and previous wharf capacity work (2010) undertaken to support the adopted Plan

For year 2018	Sales (mt)	Productive Capacity (mtpa)	% Sales/ Production
Land-won Aggregate			
• *Soft Sands*	0.493	0.92	53.6%
• *Sharp Sands and Gravels*	0.119	1.15	10.35%
Wharves	3.112	5.80	53.6%
Rail Depots	0.568	2.38	23.86%
Recycling/Secondary	0.757	3.55	21.32%

Source: Aggregate Monitoring Survey, 2018

7.25 It is recognised that capacity information will become increasingly important in future years, particularly in relation to wharves and rail depots. The study[13] by the Mineral Products Association into future aggregate requirements suggests that nationally there could be a decrease in the demand for land-won aggregates over time, as the land-won resource depletes (this is arguably occurring for sharp sand and gravels within Kent) and is substituted significantly by marine-won aggregates. Kent still has significant unused capacity in that wharfage, as it is operating at some 53.6% capacity at the end of 2018.

7.26 Rail importation has even more potential to expand, with some 76% of available capacity being unused. It will be imperative to ensure that the capacity of wharves and rail depots in Kent continue to be safeguarded, such that their operational capacity can ramped up as necessary as the land-won sands and gravels are understood to be depleting. The secondary and recycled aggregates are showing a slight decrease in sales, although there is significant capacity to be further utilised if sufficient market demand ramps up production in this sector.

[12] In 2017 the rail depot capacity is considered as under reported

[13] Long-term aggregates demand & supply scenarios 2016-30, Mineral Products Association (2017)

8. Overall Conclusions and Review of the Local Aggregate Assessment

8.1 This LAA is based upon data for 2018. It highlights that Kent is producing slightly less aggregates overall in 2018 than in 2017 (5.83mt as opposed to 6.09mt). However, the overall difference is slight and the total aggregate 10-year average (5.71mt) is not significantly different than the total aggregate three-year average (6.02mt). This indicates that aggregate sales, overall, are essentially stable. The main areas of change are with regard to certain sectors of overall aggregate supply. The most significant change over the 10-year period has occurred with the land-won sharp sands and gravels. Though sales are, in all probability artificially low, given that production has migrated over the administrative boundary of Kent into East Sussex, overall the sector is in decline. Unused operational capacity is running at 89.65%, given that there have been no reserve replenishing planning permissions in 2018. The importation of sharp sand and gravels from the marine sector (and a smaller component of land-won materials) via Kent's wharves and railheads remains close to the 2.0mtpa level and is showing an essentially static relationship with time. There remains significant capacity head to accommodate additional importation (1.812mtpa for rail depots and 2.92mtpa for wharves) if it is required by the market.

8.2 It appears that there is an overall increase in the use of secondary and recycled aggregates, particularly over the last 10-year period. Crushed rock importation has also increased with the last three years showing over 1.50mtpa importation, while in 2009 they were 1.02mt. Crushed rock from the land-won sector is unknown in terms of growth in comparison to the land-won sand and gravels. This material can serve a range of applications and is generally interchangeable with sharp sand and gravel, though not entirely. Figure 6 below (an extract from Topic Report: Interchangeability of Construction Aggregates for the Kent Minerals and Waste Local Plan 2013-30 Independent Examination submission in 2014) shows the technical spread of application. However, not all markets behave in this manner, nor can the material meet certain environmental requirements. For example, beach replenishment at Dungeness to support the Nuclear Estate would be unlikely be able to substitute crushed rock for important habitat and ecological reasons.

Figure 6: Extract from Figure from Figure 12 - The Interchangeability of Construction Aggregates 2012 of Topic Report: Interchangeability of Construction Aggregates (ref. KCC/MWLP/CS/020)

THE PRINCIPAL REQUIREMENTS

a. Coarse aggregate	b. Fine aggregate				a. Base Course	b. Surfacing	a. Coarse aggregate	b. Fine aggregate			
1.Structural concrete		2. Buried concrete	3. Bulk fill	4. Granular bases	5. Coated roadstone		6. Hot asphalt		7. Highway surface dressing	8. Building sands	*AVAILABLE MATERIALS*
(I) LOCAL RESOURCES											
*	(*)	*									1. Beach gravels
*	*	*	*	*							2. River gravels a. flint dominant
		*	*	*							b. sandstone dominant
*	*	*	*	*	*		*			*	3. Ragstone
	*		*				*			*	4. Soft sands a. Folkestone Beds
			*								b. Thanet Beds
			*							*	c. Oldhaven & Woolwich
*	*	*	*	*	*		*				5. Potential deep-mined limestone
(II) IMPORTS											
*	*	*	*	*							6. Marine dredged sand and gravel
*	*	*	*	*	*	*	*	(*)	*		7. Granite and gritstone
*	*	*	*	*	*		*				8. Somerset and Avon limestone

8.3 In terms of a landbank for Sharp Sands and Gravels, the NPPF requirement of maintaining an '*at least 7-year landbank'* is only apparently available at this time given that the sales data has to be recorded for the administrative area in which it was raised. Kent has 'lost' production to East Sussex and as a result the 3-year average of 0.177 is artificially low. The 10-year sales average reported in LAA20178 of 0.401 million tonnes per annum remains the more robust figure. This would give a 7-year landbank requirement of 2.80 million tonnes. The available reserves currently enable compliance with the NPPF.

8.4 Through time this will be lost; indications are that increased importation and use of alternative materials will make up the difference as opposed to significant new planning permissions that would replenish the landbank.

8.5 This is illustrated by the sites identified as allocations in the County Council's Submission Mineral Sites Plan Options. Following detailed site assessment, only 2.5millon tonnes have been identified to contribute to needs until 2030. Which will

result in a shortfall of between 3.918mt to 4.72mt over the Plan period. This is recognised as inadequate to rely on the land-won sharp sand and gravel sector to maintain an adequate and steady supply and therefore importation and marine dredged will have a key role to play. Importation of sharp sands and gravels will continue and potentially increase into the future and the continued safeguarding of all available importation capacity will remain imperative to ensure a steady and adequate supply of aggregates to meet the needs of the construction industry and for environmental concerns. Appendix 1 provides a re-calculation of need based on AM2019 data

8.6 The situation with regard to the land-won soft sands is in stark contrast to the sharp sands and gravels. The available reserves remain significant, though the 10-year average (0.542mtpa) has dropped the three-year average (with a slight increasing trend) remains somewhat lower, at 0.506mtpa. However, at present the available reserves would fall below the NPPF's requirement for a maintained 7-year landbank towards the end of the Mineral Sites Plan period, until 2030 (plus 7 additional years to meet NPPF requirements at the end of the Plan). The objectively identified need, as detailed in the Mineral Sites Plan's supporting evidence[14] for further reserves remains. The findings of LAA2019 do not detract from this conclusion. The allocation of Chapel Farm (3.2mt) in this plan will meet the identified need and provide some surplus. This predicted available surplus over the Plan period (2019-2030 plus 7 years) has increased over what was identified (using LAA2018 with 2017 data) when the plan was submitted, from 0.7 to 1.2mt plus. As a result, it remains reasonable that despite a possible uplift in overall housing requirements (potentially by a predicted 5% per annum compared to that reported in LAA2018), sufficient soft sand aggregate will be available. Appendix 1 demonstrates how re-calculation of need based on AM2019 (2018 data) results in surplus of between 1.202mt and 1.789mt over the Plan period that could meet increased needs and make a wider regional contribution if necessary. Marine resources of soft sand appear to remain negligible in overall supply, and artificial substitution of the material is either undeveloped or technically impractical or unviable. There is no indication that the current reliance on the land-won supply will change to any marked extent into the future.

8.7 Secondary and recycled aggregate supply has demonstrated again an underlying uplift. This may be due to the depletion of the land-won sharp sands and gravels. Available capacity, though receded since 2018, remains significant and if required this sector could significantly increase output. It remains the case that the safeguarding of facilities, as with the wharves and rail depots, is part of the adopted Plan's strategy and policy.

8.8 In conclusion Kent will become increasingly reliant on imports of sharp sands and gravels as the land-won sector depletes. The soft sand supply is more than adequate

[14] https://consult.kent.gov.uk/portal/second_call_for_sites_2016/document_library

for Kent's objectively assessed needs and potentially could contribute more widely. Land-won crushed rock reserves remains substantial in reserves and will be more than sufficient for the Plan period. Secondary and recycled aggregates continue to be important in overall supply and are showing an increase in output that may relate to land-won sharp sand and gravel depletion.

Appendix 1 - Annual Calculation of Aggregate Supply as required by Adopted KMWLP Policy CSM2. Calculation of Need for Aggregate Supply (Policy CSM: 2 Supply of land-won Minerals in Kent) over the Kent Minerals and Waste Local Plan (the KMWLP) 2013-30 Period

The adopted KMWLP's Policy CSM: 2 sets out what the level of provision for, amongst other minerals, the supply of aggregates. Including sharp sands and gravels and soft (construction) sands. The quantities identified related to the available data in 2014. Therefore, the policy makes provision for the identified need to be re-assessed in the light of data reported in the yearly LAA documents. This appendix illustrates the calculation that underpinned the Mineral Sites Plan Independent Examination in 2019, and how the 2018 data reported in this LAA changes the calculation of need for these aggregate minerals.

The Mineral Sites Plan identifies mineral sites to meet the need for both soft sand and sharp sand and gravel over the adopted Plan period 2019 to 2030 plus 7 (18 years). The original 24-year KMWLP (2014-30 plus 7) period has reduced to 18 years to reflect the passage of time since the KMWLP was adopted in 2016.

Moreover, the policy does enable this adjustment to be done as it states:

Sites will be identified in the Mineral sites Plan to support supplies of land-won aggregates at the stated levels above [10.08mt for sharp sands and gravels while resources allow and 15.6mt for soft sand] *. A rolling average of ten years' sales data and other relevant information will be used to assess landbank requirements on an on-going basis, and this will be kept under review through the annual production of a Local Aggregate Assessment*

The Mineral Sites Plan re-calculation of the requirement for **soft sand** over the reduced KMWLP period is reproduced in the text box overleaf:

10-year average figure x Year covered by the plan (18 years, 2019 to 2030 plus 7 year landbank) - Existing Permitted Reserves (estimated when the plan period commences in our case 2019) = Requirement tonnage to be provided over the Site Plan period.

Estimated permitted reserves have been calculated as follows:

Reserves as of end of 2017 = 8.85

Available reserves by the end of 2019 would be reduced by 2 years equivalent extraction (using the 10-year sales average of 0.568mt for 2018 and 2019 extraction)

Available reserves at end of 2019 = 8.85 – (2 x 0.568mt) = 7.714mt

Therefore:

(0.568 x 18) - 7.714 = **Overall Plan of 2.51mt requirement (rounded to 2.5mt)**

The data used was from the AM2018 monitoring, and thus accurate up to 2017. Since the submission of the Mineral Sites Plan for Independent Examination in Spring 2019, AM2019 (with the 2018 data) has since occurred and a revised LAA Rate (the 10-year average of 0.542mtpa) has been calculated.

Applying this revised per annum rate and the revised reserves data to the arithmetic model used by the KMWLP results in the following:

- Reserves as per the end of 2018 = 8,296,344mt (rounded to 8.3mt) from AM2019 (2018 data). Available reserves by end of 2019 would be reduced by one year's equivalent of extraction (using the 10-year average) so, 8.3mt - 0.542mt = 7.758mt
- The Plan period requirement is (0.542 x 18) - 7.58 = 1.998mt. Allocation site Chapel Farm has a potential yield of 3.2mt-1.998mt (the revised Plan requirement), gives a surplus of 1.202mt over the Mineral Sites Plan period.

If one were to say that as the Mineral Sites Plan will be adopted (as anticipated) in 2020, the Plan period is then reduced to a 17-year period, this affects the potential available surplus at the end of the Plan period in the following way:

- The (0.542 x 17 = 9.214mt) soft sand requirement for the Plan period minus the available reserves in 2020 (this being 2 x 0.542 = 1.084mt off the 8.3mt reserves using the 2018 data to represent 2 years of production) results in 7.216mt of reserves minus the Plan requirement of 9.214mt;
- Given a need of 1.998mt. Chapel Farm has a potential yield of 3.2mt. This would result in an overall surplus of 1.789mt over the 2020-30 plus 7 Mineral Sites Plan period.

Applying the same process to the **sharp sands and gravel** need is be somewhat academic. There is a recognised shortfall over the Plan period. The Mineral Sites Plan calculates this as 5.75mt. The text box below shows how this is arrived at.

10-year average figure x Years covered by the Plan (18 years, 2019 to 2030 plus 7-year landbank) - Existing Permitted Reserves (estimated when Plan starts in our case 2019) = Requirement tonnage to be provided over the Plan period.

Estimated permitted reserves have been calculated as follows:

Reserves as of end of 2017 = 3.69

Current 10-year sales average = 0.472mt

Available reserves by the end 2019 would be reduced by 2 years equivalent extraction (during 2018 and 2019 at the current 10-year sales average rate)

Available reserves at end 2019 = 3.69mt minus (2 x 0.472mt) = 2.746mt

Therefore:

(0.472 x 18) – **2.746 = 5.75mt overall Plan requirement**

The 2018 data shows that reserves have reduced to 3.3mt by end of 2019. Moreover, the LAA Rate is significantly reduced to 0.401mtpa. A revised Plan requirement would be:

- (18 x 0.401 = 7.218mt) is the need for the mineral over the Plan period,
- The available reserves (for the end of 2019) would be 3.30 – (2 x 0.401 = 0.802) giving 2.498mt
- The re-calculated shortfall is reduced to 4.72mt of sharp sands and gravel over the Plan period.

If the Plan period is reduced to 17 years to reflect the fact that we are in 2020 the following arithmetic model can be applied:

- (17 x 0.401 = 6.817mt) is the need for the mineral over the Plan period,
- The available reserves (for the end of 2019) would be 3.30 – 0.401 giving 2.899mt
- The re-calculated shortfall is reduced to 3.918mt of sharp sands and gravel over the Plan period.

The Mineral Sites Plan does not provide sufficient potentially replenishing sand and gravel reserves to address either of these shortfalls. The strategy of Policy CSM 2: Supply of Land-won Minerals in Kent is to increasingly rely on recycled and secondary materials and imports of marine sands and gravel to meet this construction aggregate need.