Kent County Council Local Aggregate Assessment 2022

November 2022

Contents

Dashboard Summary - Kent County Council LAA 2022 (using data for the calendar year 2021 data)

Aggregate Mineral Type (and origin: land-won, marine dredged and imports)	2021 Sales in tonnes or mt	Average (10 yr.) Sales in tonnes or mt	Average (3 yr.) Sales in tonnes or mt	Trend (10 yr. sales)	Trend (3 yr. sales)	LAA Rate or APR mtpa	Assumed Reserve (as per end of 2021) in tonnes or mt	LAA or APR Rate based Landbank	Productive Capacity	Local Plan Allocations	Notes
Soft Sand (excluding silica sand)	594,099	456,345	467,992	⇧	⇧	456,345	6,224,773	6.223/0.456=13.65 years	1.045mtpa (as reported)	Chapel Farm Lenham 3.2mt	
Sharp Sand & Gravel (including Hoggin etc for construction fill)	202,022	228,526	139,321	⬇	⬇	228,526	2,564,000	2.564/0.228=11.24 years	0.75mtpa (as reported)	Moat Farm Tonbridge 1.5mt Stonecastle Farm Tonbridge 1.0mt	

All Sand & Gravel (landwon including Hoggin and that used for construction	858,452	691,452	628,090	⇩	⇧	691,452	8,788,773	8.789/0.691=12.71 years	1.79 mtpa (excluding hoggin) overall the productive capacity is considered to be under reported as this was not always provided on survey returns .		
Crushed Rock (landwon)	814,859	856,686	1,126,297	⇧	⇩	0.857	16.10mt	16.10/0.857=18.8 years	2.0mtpa		
Recycled and Secondary Aggregates	992,218	834,281	937,208	⇧	⇧	N/A	N/A	N/A	1.834mtpa recycled and 50ktpa secondary Total 1.884mtpa as reported		Poor participation in AM2021 survey Indicates that the productive capacity reported in 2020 of 3.46mtpa is thought to be probably more accurate and the past 4.0mtpa AM reports estimate is considered more realistic still

Marine Imported Sand & Gravel (including land-won and marine dredged)	1.642mt	1.66mt	1.23mt	⬇	⬇	N/A	N/A	N/A	Theoretical maximum wharf capacity for all aggregates is approx. 7.30mtpa according to the 2010 joint Medway and Kent study, while the recorded 2021 capacity is reported as 6.34mtpa is assumed unchanged		
Marine Imported Crushed Rock	1.770mt	0.940mt	1.199mt	⬇	⇧	N/A	N/A	N/A			
Rail Depot Sales (Sand & Gravel)	21,747	35,120	23,860	⇧	⬇	N/A	N/A	N/A	2.225mtpa (essentially no change from previous reported capacity)		

Rail Depot Sales (Soft sand)	2,890	6057	7,778	⬇	⬇	N/A	N/A	N/A	2.225mtpa (essentially no change from previous reported capacity)		
Rail Depot Sales (Crushed Rock)	441,084	437,004	513,760	⇧	⬇	N/A	N/A	N/A			

Commentary		The **soft sand** reserves have been re-evaluated downwards; the 2020 data was an over estimation that has now been more accurately evaluated. The LAA/APR rate has slightly increased, and this will require further reserves (as anticipated from the allocation in the adopted Kent Mineral Sites Plan, Chapel Farm 3.2mt) in order to maintain supply over the remaining adopted Plan period (to 2030). **Landwon sharp sand and gravels**, as previously reported, remain a depleting resource in Kent. The reduction in the LAA/APR rate has the effect of apparently increasing the landbank. However, as sites 'go offline', supply to meet demand will be increasingly met by importation, including by road, that is not captured by AM surveys. Thus, as the landbank of 12.71 years does not truly represent consumption in Kent, it is being 'extended' by a low and decreasing LAA Rate/APR as sales decrease giving the impression of an adequate landbank exits, while the reality is that this resource in Kent is in depletion. Productive capacity in 2021 is now less than 0.75mtpa, lower than the recorded 0.85mtpa in 2020, and 1.150mtpa in 2018 (unrecorded in 2019). This illustrates the decline of this sector in its importance. The 2.50mt allocations in the adopted Mineral Local Plan will, if permitted, make a significant contribution to meeting that need identified from Kent's landwon resources, though this is unlikely to change the growing importation reliance in Kent. **Landwon crushed rock** was previously a matter that remained confidential in terms of sales and available reserves; however, the operator has waiving confidentiality to ensure that the matter of hard rock supply over the remainder of the adopted Plan period can be fully considered by the impending Full Plan review. The operator has undertaken a re-evaluation of the available reserves. The permitted landbank of 16.10mt is estimated to be just sufficient over the adopted Plan period. **Marine importation of sand and gravels** remain an essential part of overall supply; the 2019 fall off in sales was reversed in 2020 and in 2021 sales increased again, towards historic levels of sales of between 2.0-1.5mt. Overall productive capacity remains essentially the same. **Rail depot sales**, continues to remain relatively insignificant in overall supply terms. The hard rock rail imports fell in 2021 to below 0.5mpta. Overall r**ecycled and secondary aggregate** productive capacity remains the same; sales that fell off in 2019 and recovered in 2020 increased in 2021 to almost 1.0mtpa. Due to poor survey returns, this sector of supply is considered to have a greater productive capacity than that reported and so the value for 2020 has been assumed though this is less than a theoretical maximum value of 4.0mtpa.

Executive Summary

This is the tenth Local Aggregate Assessment (LAA) Kent County Council has produced based on monitoring data for the year 2021. Some data for LAA 2020 (2019 data) was extrapolated using 2018 data as the complete data set was not, (and is still not) at that time available being part of a national survey conducted by the British Geological Survey (BGS).

In the case of both landwon soft sands and the sharp sands and gravel it is considered that the appropriate 'LAA Rate' or 'Annual Provisional Rate (APR)' 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 forecast 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).

As in previous LAA reports, this report demonstrates that aggregate supply in Kent is provided by both imports and indigenous landwon materials. However, unlike the sharp sands and gravels, the soft sands (Folkestone formation crustal geological unit) that are predominantly a landwon resource, cannot easily be substituted by recycled or secondary materials. It also appears that little supply can be expected in the short to medium term from marine resources, as this has again demonstrated itself as only a small element of the overall marine won supply. Therefore, Kent will likely remain a significant supplier of landwon soft sands to markets within and, to an extent, beyond Kent. Reserves have decreased though the productive capacity is not significantly altered. Sufficient reserves exist to meet the anticipated reviewed and extended Kent Minerals and Waste Local Plan's (KMWLP) requirements. With a technical shortfall only at the end of this period (end of 2037). Given a reduced predicted housing trajectory to 2040, and the current economic slowdown, seeking to identify additional soft sand local plan allocations for a shortfall that does not become apparent until after the mid 2030's is considered premature at this time.

With regard to the landwon sharp sands and gravel resource, the evidence continues to demonstrate that these superficial deposits are depleting, the reserves are not being replenished and productive capacity has fallen. Therefore, there is a correspondingly limited potential for Kent to meet the demand from landwon resources of this aggregate type. The apparently extended life of the landbank is more a consequence of reduced sales depressing the Local Aggregate Assessment Rate/Annual Proportional Rate (LAARate/APR)[1] than that of a landbank meeting needs into the future. The replenishment of 2.50 mt from the Minerals Sites Plan

[1] The Kent LAARate/APR is the 10-year sales averages for all the landwon primary aggregates sold in Kent

allocations (subject to gaining planning permission) would make a contribution to the need although it is not anticipated that this will reverse the trend towards a greater reliance on importation of this land-won aggregate mineral.

Hard rock supply from the landwon resource in Kent is significant. The current reserves and their depletion rate were subject to confidentiality; however, this has been waived by the operator to allow for the matter of the supply of this aggregate to be discussed in the public domain. The lowering of the estimated and accurately monitored reserves and high recent rates of extraction has led to the County Council concluding that additional resources, as potential allocations in a review of the Mineral Sites Plan, it justified. The Kent Minerals and Waste Local Plan 2013-30 (KMWLP) is currently being updated this is reflected in its amended content.

Importation of sands and gravels from marine resources showed a marked decline in 2019, then a recovery in 2020 that has continued into 2021, this was also a pattern displayed by hard rock supply imported to wharves. However, this pattern was not shown by rail depot importation, that showed some reduction in primary aggregates importation. The rail importation, despite significant capacity being unused, remains relatively insignificant in overall supply terms, though hard rock is of more prominence than other aggregate types. Available wharf capacity is significant and has not materially altered, however it remains vulnerable to losses as their locations often coincide with competing regeneration initiatives.

Recycled and secondary aggregates showed a marked reduction in 2019, falling to under 0.5 mt of sales, then recovering again in 2020 to 0.90mt and in 2021 to almost 1.0 mt (13.2% of all aggregate sales in 2021). This pattern of sales, a marked fall in 2019 and a recovery in 2020 and 2021, is consistent with the pattern displayed by marine imported primary aggregates. Hard crushed rock wharf importation is at a record high (over the last 10 years 2012-21) of 1.77mt, almost matched by 1.64mt of marine dredged sand and gravel imports over wharves. The marine importation sector is increasing in importance.

It remains the County Council's view that growth predictions in housing and infrastructure delivery and maintenance are only indicative at best in terms of forecasting aggregate demand. The data demonstrates that overall construction aggregate demand has increased. It is considered that any attempt to model changes to aggregate demand based on predictions in housing and infrastructure development would be unreliable. Moreover, housing growth in Kent, based on the Kent local authorities objectively assessed needs are now showing an overall decline to 2040 compared to previous trajectories. Irrespective of what level of growth occurs in Kent and within its neighbouring areas that are also supplied by Kent, it will necessitate a robust safeguarding regime of importation facilities if a steady and adequate supply of aggregates to meet the objectively assessed needs is to be maintained.

1.0 Introduction

1.1 The purpose of this Local Aggregate Assessment (LAA) report for 2022 (including 2021 data) is to detail the current and predicted situation in Kent with respect to all aspects of aggregate supply. This is Kent County Council's tenth LAA and the fifth 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. It has reached the 6th year since adoption and is in the process of being reviewed, a Regulation 18 formal public consultation on possible modifications was held in late 2021. This demonstrated that further amendment of the Plan was necessary, a second Regulation 18 public consultation is anticipated in late 2022. The Kent Mineral Sites Plan, that identified landwon mineral sites (one soft sand and two sharp sand and gravel sites) to deliver the adopted Plan's supply objectives was adopted in September 2020. The Full Review KMWLP may result in this plan requiring review also, as a corollary effect on further clarification of the landwon aggregate mineral supply policy review.

1.2 The adopted Plan set out the quantities of aggregates to be provided over the period of the entire Plan in policy, this inevitably is subject to change as more recent monitoring data, as reported in the annual LAAs, that is relevant to an understanding of supply and demand. Monitoring data is used to estimate the quantities required to maintain landbanks of 'at least 7 years' for landwon sand and gravel and 'at least 10 years' for landwon hard, crushed rock at any one time in the 2016 adopted Plan period (2013 t0 2030), as require by the National Planning Policy Framework (NPPF, 2021). It is important to recognise that the data available to the County Council is that which represents past sales and available reserves. The future predictions of need to meet the NPPF's requirements, as based on this data that is subject to variation through time, given that there are unknowns in terms of potential future permitted reserve re-evaluations and changes to production (sales) rates.

1.3 It is also important to note that the collected data used in the preparation of this report, from the Annual Monitoring (AM) of aggregates sales by Kent County Council, is conducted on behalf of the South East England Aggregate Working Party (SEEAWP) for sales data in 2021. The AM survey collects annual sales data from operators of active mineral extraction sites, minerals wharves, minerals rail depots and recycled and secondary and recycled aggregate processing sites in the county of Kent. Where there are less than three operational sites supplying a particular type of mineral, as in the case of Kent's landwon hard rock (when crushed is a useable aggregate) quarries, commercial confidentiality normally prevents the reporting of sales or reserves. However,

given the need to understand hard (crushed) supply over the remaining Plan period, and into the anticipated future of the review of the Plan.

2.0 Aggregate Forming Minerals

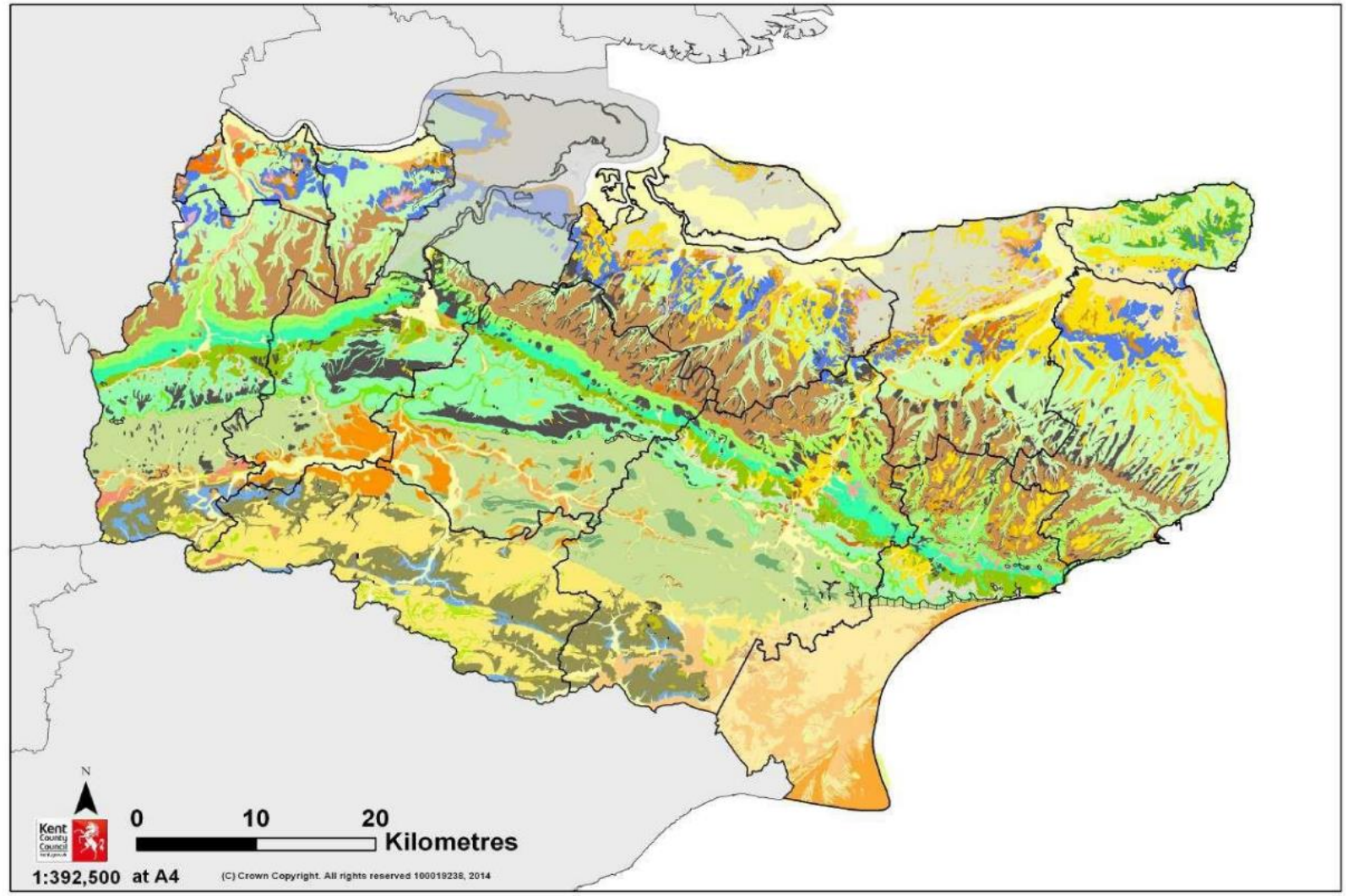
Geology of Kent

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 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 gravel deposits inland. The coastal processes of deposition form storm beach sands and gravels (significantly, but not limited to, those found in the area around Lydd and the cuspate foreland of Dungeness) that were deposited on land, and once sea levels rose at the end of the last glaciation, they became 'active' again in the sedimentary basin of the North Sea/English Channel areas. The extensive 'soft' sand (and pure silica sands) ancient beach deposit (the Folkestone Beds) is somewhat older, being part of the Lower Greensand Group of the Lower Cretaceous epoch (that are between 100-140 million years old).

2.2 The soft sands (so called for their high degree of roundness and consistent size of the sand particulates) are found in the Folkestone Formation. A significant crustal unit, it is characterised as a well sorted, medium to coarse grained weakly cemented sandstones. It is considered that it is a shallow beach setting marine deposit. The formation outcrops at Folkestone and runs along the base of North Downs landscape feature in an east west trend, being part of the northern slopes of the Wealden Basin. The formation passes by the main settlements of Ashford, Maidstone and Sevenoaks before running into East Sussex.

2.3 Important and extensive 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. In the east of the county there is also the deep Carboniferous Limestone and coal measures, the coal (a carbonaceous deposit) mining ended in 1989. The associated limestone could, theoretically, also be mined as an aggregate forming mineral. However, this would require very significant investment that would likely to be unviable at a local scale, very possibly requiring a national and/or international market.

Figure 1: Geology of Kent both Solid and Superficial

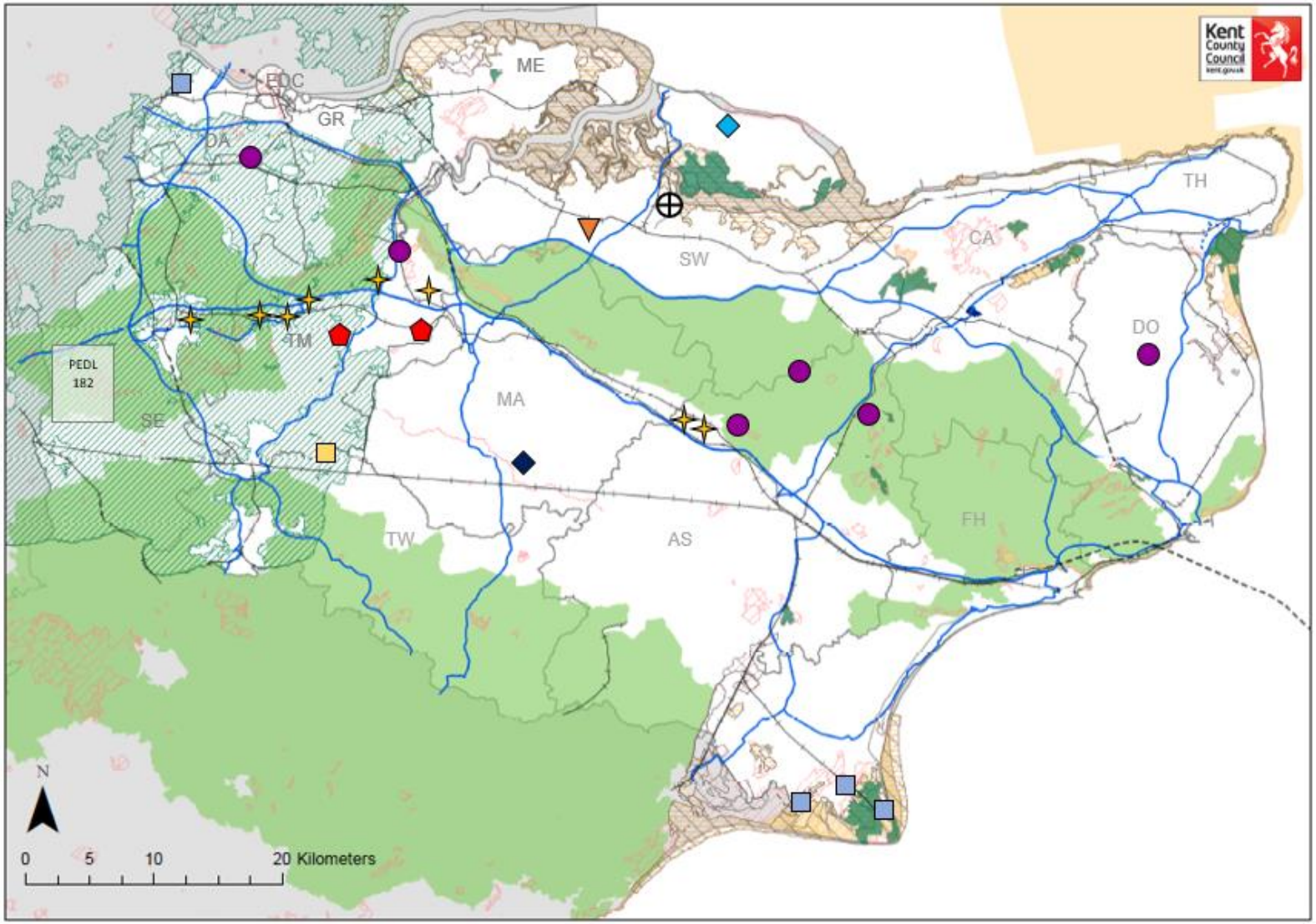


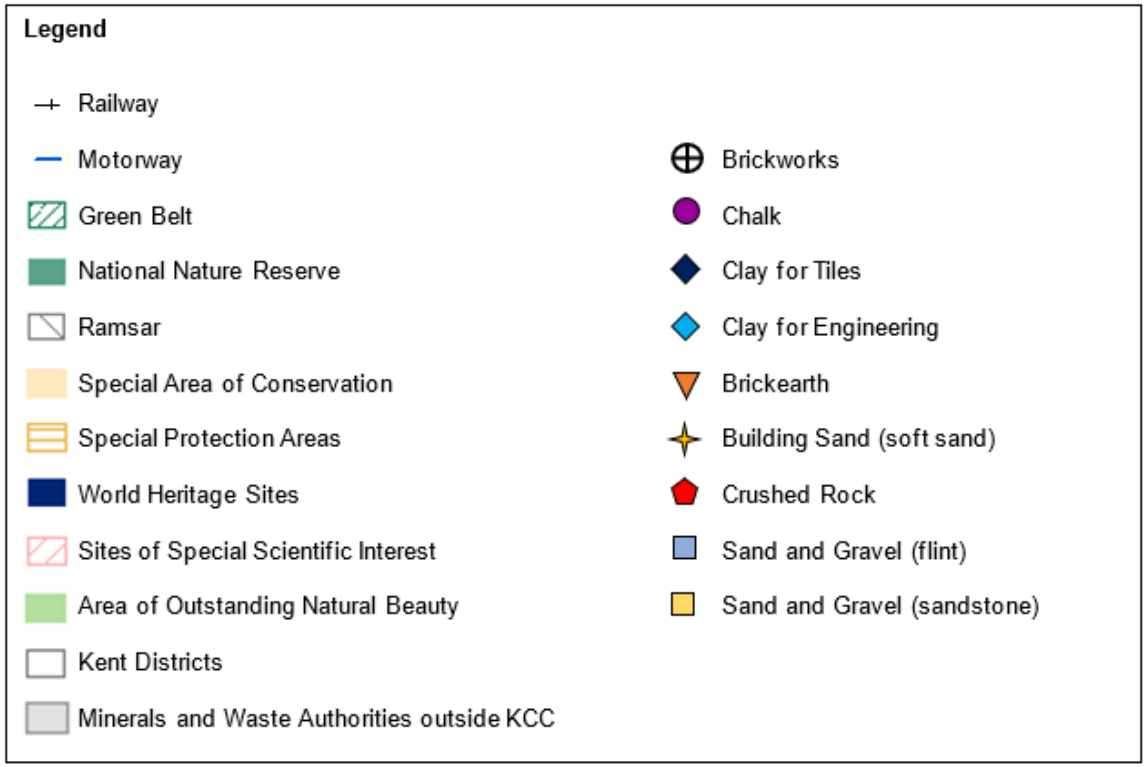
Legend: Geology of Kent

3.0 Permitted Sites Producing Aggregates in Kent

3.1 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 close to Lydd and at Dungeness for sharp (concreting) sand and gravel supply. While the area around Maidstone has historically supplied much of the crushed hard rock materials. The soft (and industrial grade pure silica) building sand (mainly used in mortar production) 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 indicative location of the county's active quarries in in 2021 able to supply primary landwon aggregates.

Figure 2: Location of Active Quarries in 2022





3.2 Kent currently has two active hard rock quarries producing crushed hard rock aggregate from the Hythe Formation (Kent Ragstone), five soft sand quarries winning material from the Folkestone Beds and five sharp sand and gravel quarries (only three of which were operational in 2021). 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 as of 2021. Table 1 overleaf details these sites.

Table 1: Permitted Aggregate Quarries in Kent 2021

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[2]
Allens Bank, Lydd	*Brett Aggregates Ltd*	*Yes*	-	-	*Inactive*
Conningbrook Quarry	Brett Aggregates Ltd	Yes	-	-	*Closed*
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*[3]
Aylesford Quarry, Aylesford	*Aylesford Heritage Ltd*	-	*Yes*	-	*Inactive* [4]
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	-	Active[5]
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*	-	*Inactive*
Nepicar Sand Quarry, Wrotham	J Clubb Ltd	-	Yes	-	Active
Greatness Farm, Sevenoaks	Tarmac Ltd	-	Yes	-	Active[6]

[2] Extraction has moved into East Sussex, the processing of material and some reserves remained in within Kent in 2021
[3] 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, the site is inactive as of 2021
[4] No off-site sales in 2021 of soft sand
[5] Inactive in 2018, early 2019 became active remains so in 2021
[6] The site also produces sharp sand and gravel, though predominantly soft sands from the Folkestone Formation

4.0 Primary Landwon Aggregate in Kent

Sharp Sand and Gravel

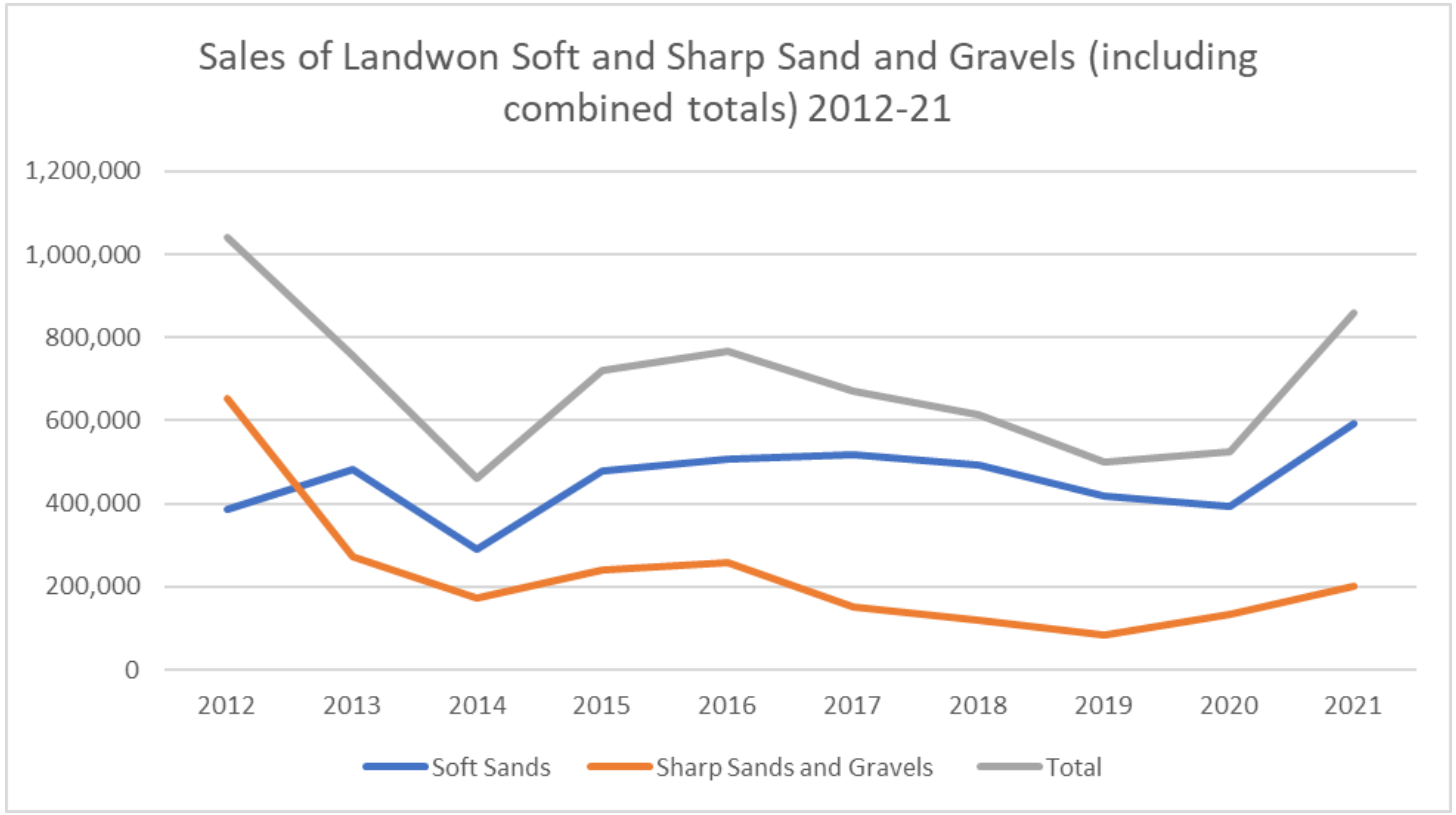
4.1 The sales of landwon sharp sand and gravel and soft sand in Kent since 2012 are shown in Table 2 and graphically in Figure 3 below. The overall, long-term trend for landwon sand and gravel aggregate is a reduction in recorded sales, though this is significantly more pronounced for the sharp sand and gravels, that are more widely depleted than the soft sands, as will be discussed and illustrated later.

Table 2: Landwon Soft Sand and Sharp Sand and Gravel Sales in Kent, 2012-2021 (tonnes)

Year	Soft Sand Tonnes	Sharp Sands and Gravel Tonnes	Totals
2012	387,746	652,285	1,040,031
2013	483,165	273,000	756,000
2014	289,087	172,672	461,759
2015	480,215	239,550	719,581
2016	506,663	259,550	766,213
2017	519,414	151,165	670,579
2018	493,179	119,259	612,438
2019	417,027	83,709	500,736
2020	392,850	132,231	525,081
2021	594,099	202,022	858,452
Last 3-year average (2019-21)	**467,992**	**139,321**	**628,090**
Last 10-year average (2012-21)	**456,345**	**186,150**	**691,087**

Source: Aggregate Monitoring Surveys, 2012-2021

Figure 3: Sales of landwon Soft Sand and Sharp Sand and Gravel 2012-21 (Tonnes)



4.2 There was a marked fall off in sales in 2014, with sales recovering in 2015 and 2016. This recovery stalled during 2017 and has recovered marginally in 2020 and 2021. The soft sand displayed sales in the 0.50mtpa level until 2018, slumped in 2019 and 2020 and recovered to 0.50+mtpa levels in 2021. However, the sales of the sharp sand and gravel sales have shown a dissimilar overall pattern, with a marked decline in 2014 and then a marginal recovery that then declined again into 2019, a marginal recovery occurred in 2020-21. In 2011 sales were 0.62mt, this declined to less than 0.20 mt in 2017/18. The sales in 2019 markedly fell to just 0.083 mt (lowest in the last 10-year period) and marginally recovered to 0.132mt in 2020 and increased again to 0.202mt in 2021. Probable reasons for the decline in 2019 will be discussed later in this report. However, there is no indication of a return to the 10-year average sales of around some 0.50mtpa observed in 2018. The sales curve is clearly one of

a general decline only marginally reversed in 2020-21 caused by resource depletion in the sharp sand and gravels, as will be discussed latter.

Sharp Sand and Gravel

4.3 The sharp sand and gravel landbank based on local requirements is calculated at 4.23 years (based on the adopted Plan Policy CSM 2 requirements 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). The recently monitored reserves (2,564,000mt) in 2021 divided by the recent 10-year (2012-21) average sales data (used to define the LAA/APR rate of 0.228 mt) indicates that there is sufficient reserve for 12.71 years.

4.4 However, whatever yearly drawdown figure is used, it is considered that the landbank figures for the landwon sharp sands and gravels, are definitively demonstrating a decline in available reserves (and replenishing resources) based on geological scarcity and what can be sustainably sourced in the county. New reserves, that would replenish the landbank for this aggregate mineral, are not coming forward as new planning permissions, this has been the case for some years, and, while development of sites allocated in the Mineral Sites Plan (2.50mt) would improve supply, this would only partially mask the established declining resource pattern. Output from one significant Kent quarry had been zero since 2015 given that extraction had moved into East Sussex, with apparently its last practicable reserves in Kent being exploited in 2020, when it was decided to count 50% of its sales as Kent sales serving the established Kent market. However, as this site will soon be worked out, it will be entirely lost to the consideration of Kent's overall landwon sand and gravel aggregate supply assessment.

4.5 The actual Kent overall consumption of the sharp sands and gravel material though, remained unrecorded by the AM process as the actual areas where the materials are used are not recorded by the general AM process. More detailed analysis is periodically undertaken that looks at imports and exports across the SEEAWP area that demonstrates where consumption has occurred. Therefore, the LAA Rate/APR Rate (now 0.228mtpa) for this material is currently not fully reflective of the demand in Kent for landwon sharp sand and gravel. This metric is, in all probability, too low in that it is giving an 'inflated' landbank duration based on lowering sales that is likely to be unrelated to the true demand, which is being increasingly met by importation. However, given that the estimate of supply requirements in the currently adopted Policy CSM 2 is caveated with "…. *of at least seven years supply……will be maintained* ***while resources allow***" this is not an unexpected conclusion. The policy wording is an explicit acknowledgment of the geological scarcity of this type of aggregate deposit in Kent, coupled with material planning

considerations that determine what level of resources can be sustainably allocated for future supply in local plans, that mean the landbank cannot be maintained in line with the NPPF requirements.

4.6 The potential for Kent to be able to provide additional reserves of this aggregate type is a matter that was considered during the independent examination of the Mineral Sites Plan. The adopted (September 2020) Mineral Sites Plan identifies two sites for allocation (Moat Farm and Stonecastle Farm extension) which together could not provide sufficient future reserves to maintain an at least 7-year landbank over the Plan period. This position has not materially altered. Alternatives, to the land won supply are anticipated to continue to significantly come from (but not limited to) the imported marine dredged aggregate sector.

Soft Sands

4.7 Table 3 below shows the total current (2021 data) permitted reserves, landbank and recorded sales for the period 2012-21 for the soft sands.

Table 3: Landwon Soft Sand Sales and Reserves and Landbank in Kent, 2012-2021 (tonnes)

Year	Soft Sand Tonnes	Reserves as of end of 2021 (tonnes)
2012	387,746	
2013	483,165	**6,224,773**
2014	289,087	
2015	480,215	
2016	506,663	
2017	519,414	
2018	493,179	
2019	417,027	**Landbank life based on 10-year sales average is 13.64 years**
2020	392,850	
2021	594,099	
Last 3-year average (2019-21)	**467,992**	
Last 10-year average (2012-21)	**456,345**	

5 Source: Aggregate Monitoring Surveys, 2012-2021

4.8 In 2021, data shows that for soft sand this position has, to a limited extent, reversed. The 10-year average sales value (LAA Rate/APR) has marginally increased, while the permitted reserves have shown a decrease from the 9.34mt recorded in 2020 to 6.225mt in 2021. Apparently, a re-evaluation error in 2020 led to an inflated overall reserve figure for that year. Moreover, the continued decline in production observed, that has led to a reduction of the 10-year average from 0.542mtpa in 2018 and 0.417mt in 2019 to 0.441mtpa in 2020, came to a halt in 2021 which showed an increase to 0.456mtpa. While the slight increase in sales average is important, the lowering of the reserve bases is more significant. The landbank of 21 years at the end of 2020 (when applying the 10-year averaged sales data (the LAA Rate/APR) has now commensurately reduced to 13.64 years. The necessity for the soft sand reserves to accord with the NPPF's requirement to have a landbank of "*at least 7 years*" is met at this time. The adopted Plan requirement spans to 2030, by which time the landbank may only be at 5.56 years, however the allocation in the adopted Kent Mineral Sites Plan (2020), of 3.2mt (at Chapel Farm), provides some certainty that the appropriate life of the landbank will be maintained thus ensuring a '*steady and adequate'* supply of this adopted Plan period.

Crushed Rock (Hythe Formation)

4.9 Of the two hard rock resources in Kent (the other being the Carboniferous Limestone) only one of which has given rise to crushed rock aggregates, this being the Hythe Formation (Kentish Ragstone). This has traditionally been quarried in the Maidstone area, though not exclusively so. There are only two active sites in Kent and in the past confidentiality prevented a detailed report of sales. Therefore, the proxy of 0.78mtpa has been used in past LAAs and during the formulation and examination of the adopted KMWLP Plan, as this was the figure derived for the now revoked South East Plan. The operator has now relaxed their wish to maintain confidentiality. The reserves of this material 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 reserve, in addition to reserves currently available at Blaise Farm Quarry, are counted as the landwon hard rock in Kent available to meet the NPPF requirement of maintaining an at least 10 years crushed rock landbank for the Plan period.

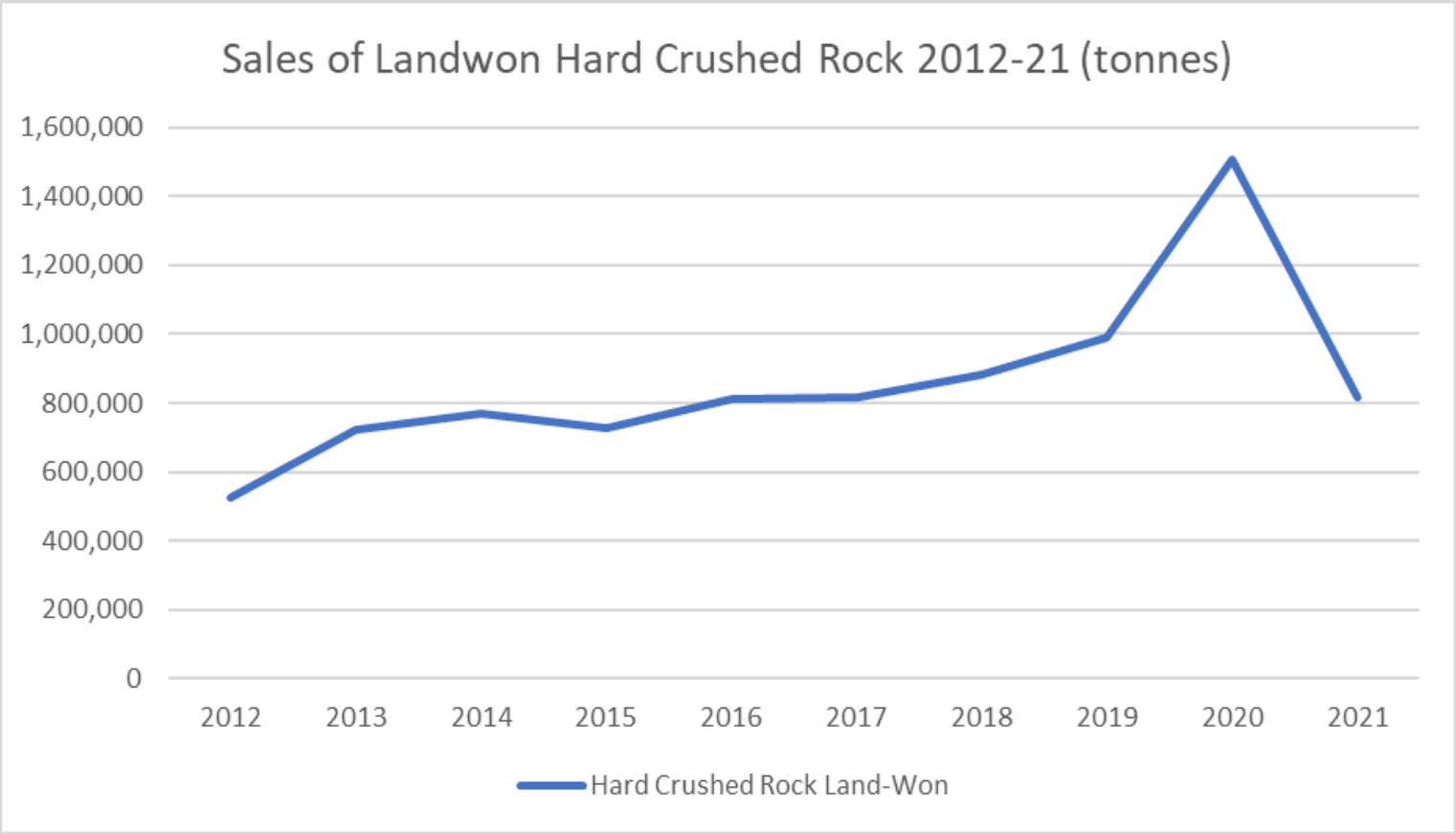
4.10 Table 4 and Figure 4 below shows the monitoring data for landwon crushed rock sales graphically. The pattern is one of significantly increasing demand since 2012; peaking in 2020 at an unusually high level of 1.5mtpa, with sales falling back in 2021 to the levels more recently recorded in the 0.80mtpa range.

Table 4: Landwon Hard Rock Sales in Kent, 2012-2021 (Million tonnes)

Year	Tonnes
2012	526,281
2013	722,985
2014	767,198
2015	727,272
2016	811,935
2017	817,437
2018	880,063
2019	990,590
2020	1,508,239
2021	814,859
Last 3-year average (2019-21)	**856,686**
Last 10-year average (2012-21)	**1,104,563**

Source: Aggregate Monitoring Surveys, 2012-2021

Figure 4: Kent Sales of Landwon Crushed Rock 2012-2021 (tonnes)



4.11 Sales of hard crushed rock were not represented in previous LAA's given the need to maintain confidentiality where sales occur from less than three sites. Reserves of the two operational sites have been re-evaluated to be lower than anticipated to be at this point, and to help inform future provision and policy relating to the supply of this material the single operator has waived confidentiality for hard rock sales in Kent.

4.12 The reserves for the end of 2021 are estimated as 16.1mt by the operator using three-dimensional modelling. The LAA Rate/APR is 0.857mtpa and so an 'at least 10-year landbank' supply exists over the adopted Plan period until 2031, after which

the 10-year maintained landbank is not attained, and total exhaustion occurs in 2042. The hard crushed rock supply position is being reviewed as part of the Plan's wider Full Review, as formally required at the 5th year mandatory review of the Plan and is more fully discussed later in this document.

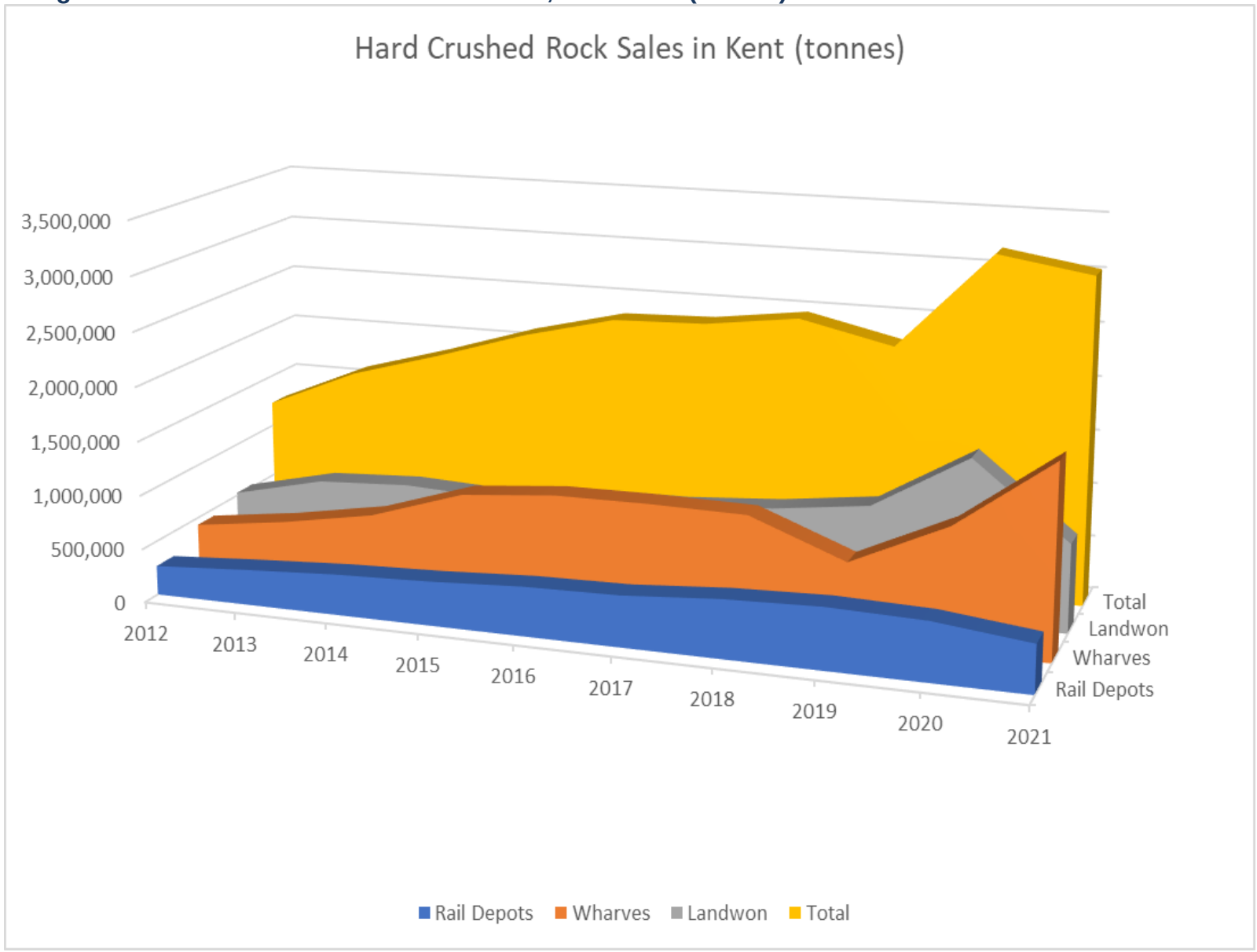
4.13 The AM2021 data (reporting 2021 sales) shows that the LAA Rate/APR (taken as the 10-year sales average) has decreased from the high in 2020 when sales had reached some 1.5mt. At present, based on three-dimensional modelling, it is estimated that the available remaining reserves are 16.1mt[7]. On this basis, the permitted LAA Rate/APR landbank is 18.78 years. This is just sufficient for the remaining adopted Plan period of 18 years ((2022-2030 (8 years) plus 10-year end of Plan maintained landbank). While the apparent reduction of available overall reserves, from previous estimates, does not currently appear to endanger the ability of the Mineral Planning Authority to ensure a steady and adequate supply of land-won hard rock, if sales increase again then this position would likely change. Table 5 (and Figure 5) below demonstrates the importance of this reserve to the supply of crushed hard rock in Kent, and how the landwon supply is supplemented by importation via wharves and railheads.

Table 5: Hard Rock Sales in Kent 2012-2021 (tonnes)

	Wharves	Rail Depots	Landwon	Total
2012	432,677	270,586	526,281	1,229,544
2013	546,541	326,578	722,985	1,596,104
2014	697,421	375,938	767,198	1,840,557
2015	975,875	405,331	727,272	2,108,478
2016	1,052,971	452,751	811,935	2,317,657
2017	1,057,785	468,785	817,437	2,344,007
2018	1,043,721	533,110	880,063	2,456,894
2019	708,751	561,738	990,590	2,261,079
2020	1,119,202	538,458	1,508,239	3,165,899
2021	1,770,068	441,084	814,859	3,026,011
Total	**9,405,012**	**4,370,038**	**8,299,346**	**22,074,396**
3-year average	**1,199,340**	**513,760**	**1,104,563**	**2,817,663**
10-year average	**940,501**	**437,004**	**856,686**	**2,234,623**

[7] The reserves value is dependent on planning permission controls and other matters to do with the nature of the resource, rock density ratios of hard rock to Hassock [clay layers].

Figure 5: Hard Crushed Rock Sales in Kent, 2012-2021 (tonnes)



Crushed Rock (Carboniferous Limestone)

4.14 Carboniferous limestone is the most extensively used crushed rock aggregate geology in England. It possesses the physical and chemical characteristics that make it a high-quality material which is used in both concreting aggregate and roadstone. In Kent carboniferous limestone occurs below the overlying Chalk and Lower Cretaceous rocks. The BGS commissioned report CR/02/125N Minerals Resource Report (Kent [comprising Kent, Medway and London Borough of Bexley and Bromley])[8] states that the 'top' of this geological unit is some 300m below the land surface (in the Richborough area) and 500m below land contours is considered the maximum 'mineable' depth of this material. Undoubtedly, this resource is one that could be technically accessible, and would provide an alternative source of high-quality crushed rock aggregate not only for Kent but for a wider regional/national market. While there has been no apparent progress in advancing the potential for this material, it remains a possible option for the future, and one that the adopted Plan allows for.

Aggregate Reserves and Landbanks

4.15 Table 6 details the hard (crushed) rock, sharp sand and gravel, and soft sand available reserves and landbanks that are derived from the AM2021.

Table 6: Kent Landwon Aggregate Reserves and Aggregate Landbank as of 2021

Landwon Aggregate Primary Minerals	Permitted Reserve (mt) at end of 2021	Landbank based upon 10yr average sales (LAA Rate) between 2012-2021 (years)	Landbank based upon 3yr average sales between 2019-2021 (years)	Landbank based upon 2021 sales alone (years)
Soft Sand	**6.225**	6.225/0.456 = **13.56 years**	6.225/0.468 = **13.30 years**	6.225/0.594 = **10.48 years**

[8] https://www2.bgs.ac.uk/mineralsuk/download/england/kent.pdf

Sharp Sand & Gravel	**1.384**	1.384/0.228 = **6.07 years**	1.384/0.139 = **9.96 years**	1.384/0.202 = **6.85 years**
Hard Rock	**16.10**	16.1/0.857 = **18.78 years**	16.1/1.104 = **14.58 years**	16.1/0.815 = **19.75 years**

Chalk

4.16 There were no sales of chalk as a graded aggregate in Kent in 2021.

Recycled/Secondary Aggregates

4.17 Data pertaining to sales of recycled or secondary aggregates is collected annually as part of the surveys carried out by Mineral Planning Authorities. Figures 6 and 6a shows the location of current active recycled sites (and wharf and rail depot locations) in operation in Kent that produce secondary and recycled aggregates.

4.18 The sales figures of the recycled and secondary aggregate in Kent are shown in Table 7. Kent has 22 permitted sites engaged (some inactive in 2021) in producing recycled aggregates from the construction, demolition and excavation waste stream and secondary aggregates from industrial by-products. As was the case for AM2020, a significant number of producers of recycled/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 occurred in 2021, this is not a unique position for AM2021. It is reasonable to assume that sales of materials from the recycled and secondary aggregate sector in Kent are likely to be over 1.0mtpa at this time. Moreover, the combined recycled/secondary sector has a reported productive capacity of 1.884mtpa (AM2021 data), in 2020 this was given as 3.41mtpa for the recycled aggregates and 50Ktpa for the secondary aggregates, a total of 3.46mtpa. The reduced capacity value derived from AM2021 is highly likely a result of under-reporting rather than cessation of operations and so the 3.46mtpa to 4.0mtpa value is used in this LAA as a more reliable overall estimate for the productive capacity of the combined recycled/secondary aggregates sector.

Figure 6: Location Map of Active Recycled and Secondary Aggregate Sites in Kent

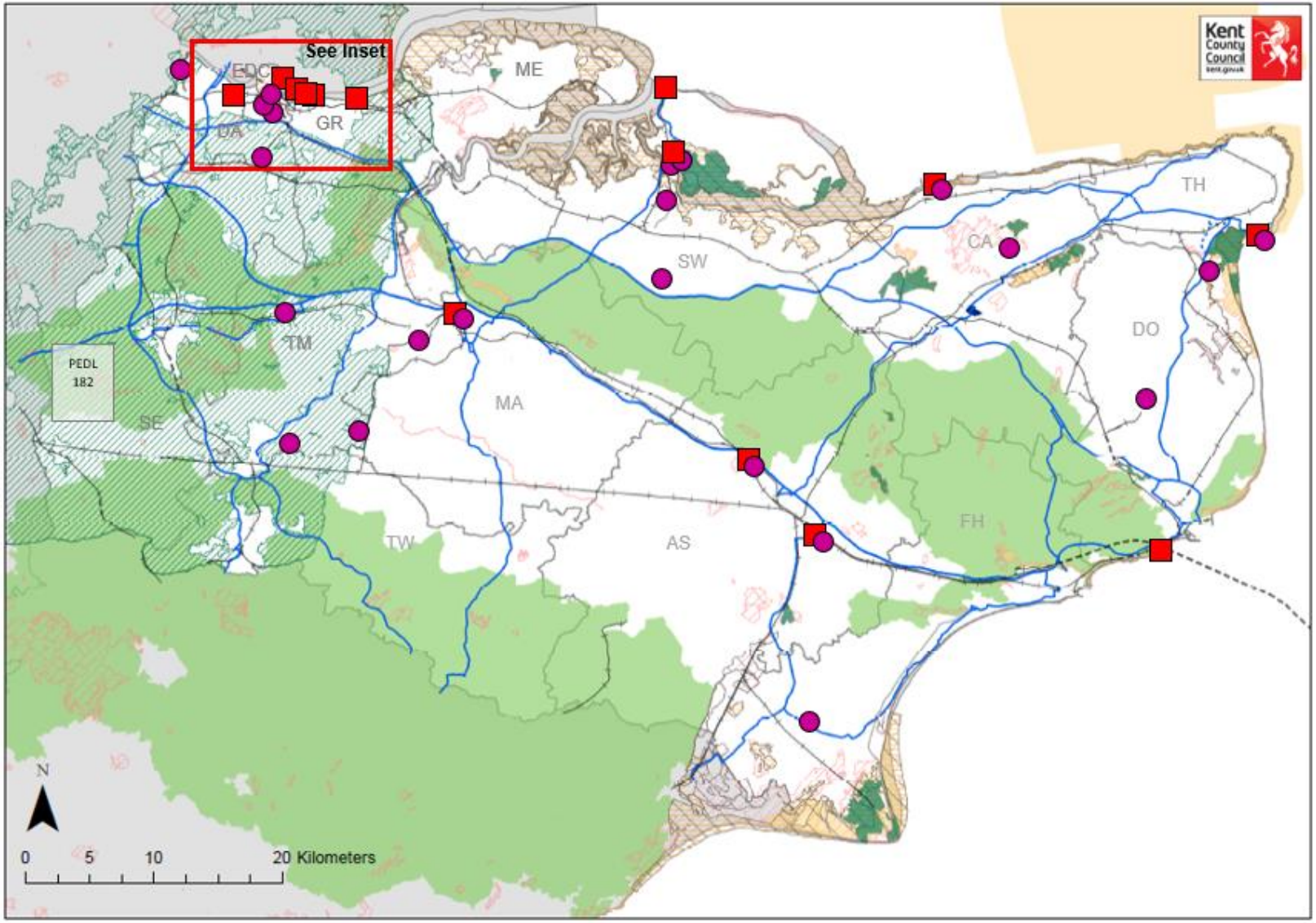
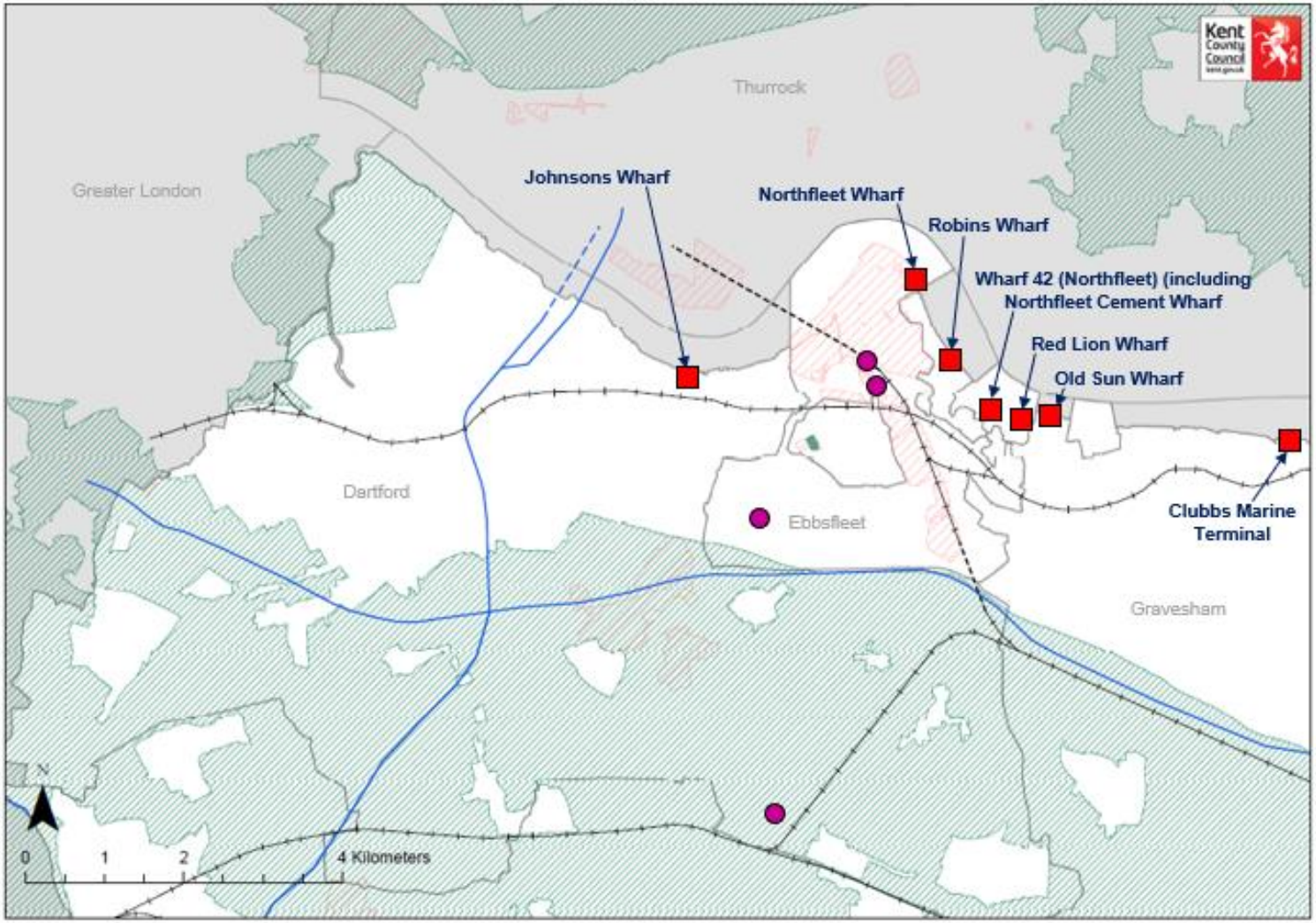


Figure 6a: Location Map of Active Recycled and Secondary Aggregate Sites in Northwest Kent



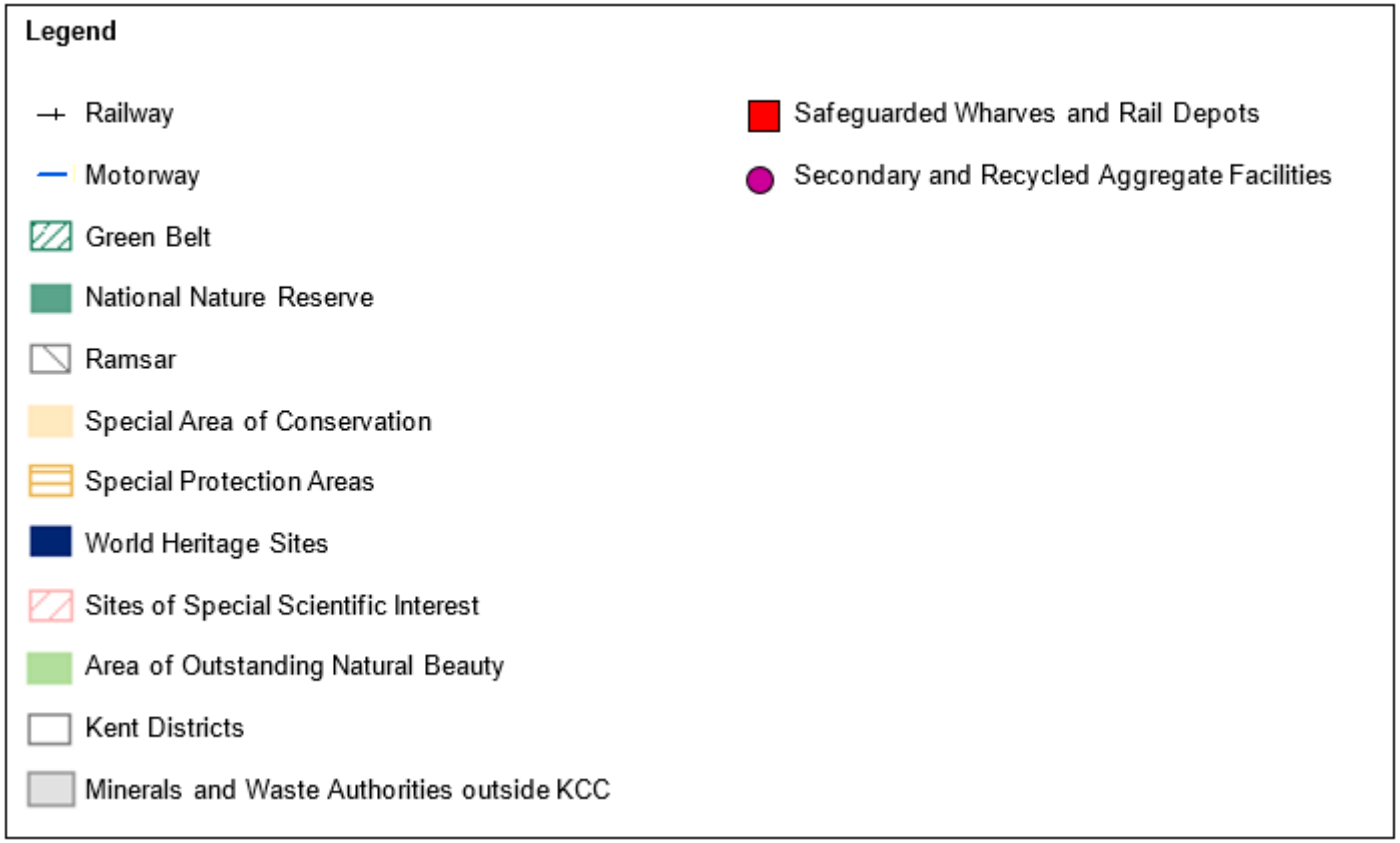

Legend
Railway
Motorway
Green Belt
National Nature Reserve
Ramsar
Special Area of Conservation
Special Protection Areas
World Heritage Sites
Sites of Special Scientific Interest
Area of Outstanding Natural Beauty
Kent Districts
Minerals and Waste Authorities outside KCC
Safeguarded Wharves and Rail Depots
Secondary and Recycled Aggregate Facilities

Table 7: Recycled and Secondary Aggregate Sales in Kent, 2012-2021 (Million tonnes)

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	3-year average	10-year average
0.688	0.836	0.729	0.845	1.029	0.906	0.757	0.419	0.909	0.992	**0.937**	**0.834**

Source: Aggregate Monitoring Surveys, 2012-2021

4.19 Sales of secondary/recycled aggregates combined account for 15.2% (0.992mt) of the total production and importation in the County of all types of aggregate. This is an increase to that recorded in AM2020 (2020 data) where the recycled and secondary aggregate share of the overall aggregate supply market was 14.97%. The 0.992mt is an increase in production that reflects a continued recovery to the levels seen in 2017 (1.03mt). This essentially affirms that this sector of supply is increasing in importance, though it is not considered to be being reliably reported due to poor survey participation. It should also be recognised that this sector of supply will be contingent on the supply of materials from the construction, demolition and excavation (C, D&E) waste stream. This will be unlikely to simply increase through time, as the material arises in response to other, wider, economic factors and not due to a simple demand for secondary and recycled aggregates derived from this material.

5.0 Aggregate Importation

Marine and Landwon Sand and Gravel

5.1 Kent has 9 active/semi-active wharves out of a total of 12 safeguarded wharves[9] located on its coast as shown in Figure 6 and 6a above that supply the bulk of sand and gravel (marine dredged) imports, rail depots deliver considerably less (see Fig 11 on page 38). Dunkirk Jetty at Dover Western Docks had been completely decommissioned (as reported first in AM2016) and but has become active again in 2021. The level of marine-won sand and gravel (including some marine soft sand) sales at wharfs in Kent is shown in Table 8 below (and graphically in Figure 8).

[9] By virtue of Policy CSM 6: Safeguarded Wharves and Rail Depots of the Kent Minerals and Waste Local Plan 2013-30

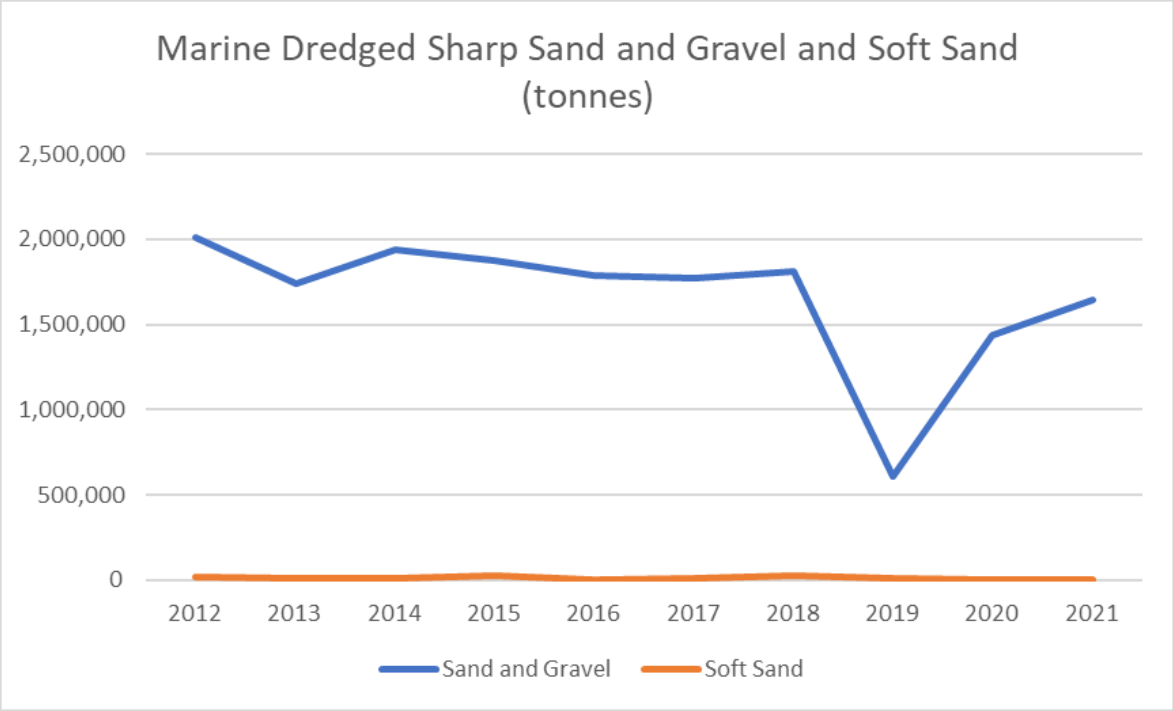
Table 8: Marine Sand and Gravel Sales in Kent, 2012-2021 (Million tonnes)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	3-year average	10-year average
Sales	2.014	1.743	1.938	1.874	1.788	1.773	1.809	0.608	1.440	1.644	**1.230**	**1.663**

Source: Aggregate monitoring surveys, 2012-2021

5.2 Kent's wharf capacity remains substantial: It was reported to be 5.60mtpa in 2020, increasing to a reported 6.34mtpa in 2021. Theoretically it is understood to be 7.30mtpa. Sand and gravel imports via the wharves showed a marked decline in 2019, then a recovery to 1.44mtpa in 2020 and 1.642mtpa in 2021. It is assumed that the uncertainty surrounding the UK's exit from the European Union was responsible for this observed rapid decline and recovery. The bulk of the sand and gravel imports are marine dredged in origin; landwon sand and gravel is also imported but in relatively limited quantities. Given that landwon supply of essentially similar resource is rapidly depleting in Kent this importation source will, it is assumed, continue to be the main source of supply of this type of aggregate into the future.

Figure 7: Marine Dredged Sharp Sand and Gravel and Soft Sand 2012-21



5.3 The marine sand and gravel 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 country'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.*

5.4 The area of the overall resource that supplies Kent, was estimated as 99mt in 2011, and remains probably in the order of 87.31mt as of 2021 given the recorded landings in previous aggregate monitoring returns. The resource, therefore, is of a sufficient magnitude to supply Kent into the foreseeable future.

Crushed Rock Importation

5.5 Landwon sales of crushed rock overtook importation via wharves in 2021. The increase in landwon sales is thought to be due to local high demand associated with the construction of HGV parking areas close to the Port of Dover which formed part of preparations for the UK's exit from the European Union. The last three-year sales average value of 1.0+mtpa is not considered to represent a long-term trend, as sales have fallen back to the 0.8+mtpa levels which are more typical of those observed in the past.

5.6 Though sales via rail depots declined in 2021 to 0.441mt from over 0.50mt in 2020, there has been a more moderate increase overtime and it is considered likely that sales will remain in the order of the 0.40-0.50mtpa into the future. The data shows that landwon and wharf importation remain the dominant forms of hard crushed rock supply at this time.

Landwon Aggregate Importation

5.7 Table 9 clearly demonstrates that the vast majority of imported landwon aggregate is supplied via wharves, and far less via rail depots, with an exception for hard crushed rock. It is highly likely that in the future even more aggregate will be supplied via this route as landwon sources in Kent become depleted, emphasising the need to safeguard both wharves and rail depots.

However, both soft sand and sharp sand and gravel that is landwon in other areas also enters Kent via rail depots (see Figure 9 below for the location of the rail depots [4 in total] in Kent). Table 9 below illustrates the sales of imported landwon aggregate that have occurred since 2012.

Table 9: Landwon Aggregate Importation to Rail Depots and Wharves in Kent, 2011-2021 (Million tonnes)

Year	Soft Sands (Rail)	Sharp Sands and Gravel (Rail)	Crushed Hard Rock (Rail)	Crushed Hard Rock (wharf)	Totals
2012	894	41,234	270,586	432,677	745,391
2013	6,128	35,702	326,578	546,541	914,949
2014	4,591	92,095	371,617	697,421	1,165,724
2015	5,567	29,064	405,331	975,875	1,415,837
2016	5,370	29,118	452,751	1,052,971	1,540,210
2017	8,212	24,214	468,785	1,057,785	1,558,996
2018	6,477	28,194	533,110	1,043,721	1,611,502
2019	10,222	24,917	561,738	708,751	1,305,628
2020	10,222	24,917	538,458	1,119,202	1,692,799
2021	2,890	21,747	441,084	1,770,068	2,235,789
Last 3-year average	**7,778**	**23,860**	**513,760**	**1,199,340**	**1,744,739**
Last 10-year average	**6,057**	**35,120**	**437,004**	**940,501**	**1,418,682**

Source: Aggregate Monitoring Surveys, 2012-2021

5.8 The main type of landwon aggregate imported into Kent is crushed hard rock; predominantly via wharves though rail is significant as well. Importation represents an insignificant form of supply of landwon sands and gravels. Figure 8 below shows the sales of imported landwon primary aggregate between 2012-2021 graphically.

Figure 8: Landwon Aggregate Sales from Rail Depots and Wharves in Kent, 2012-2021 (Million tonnes)

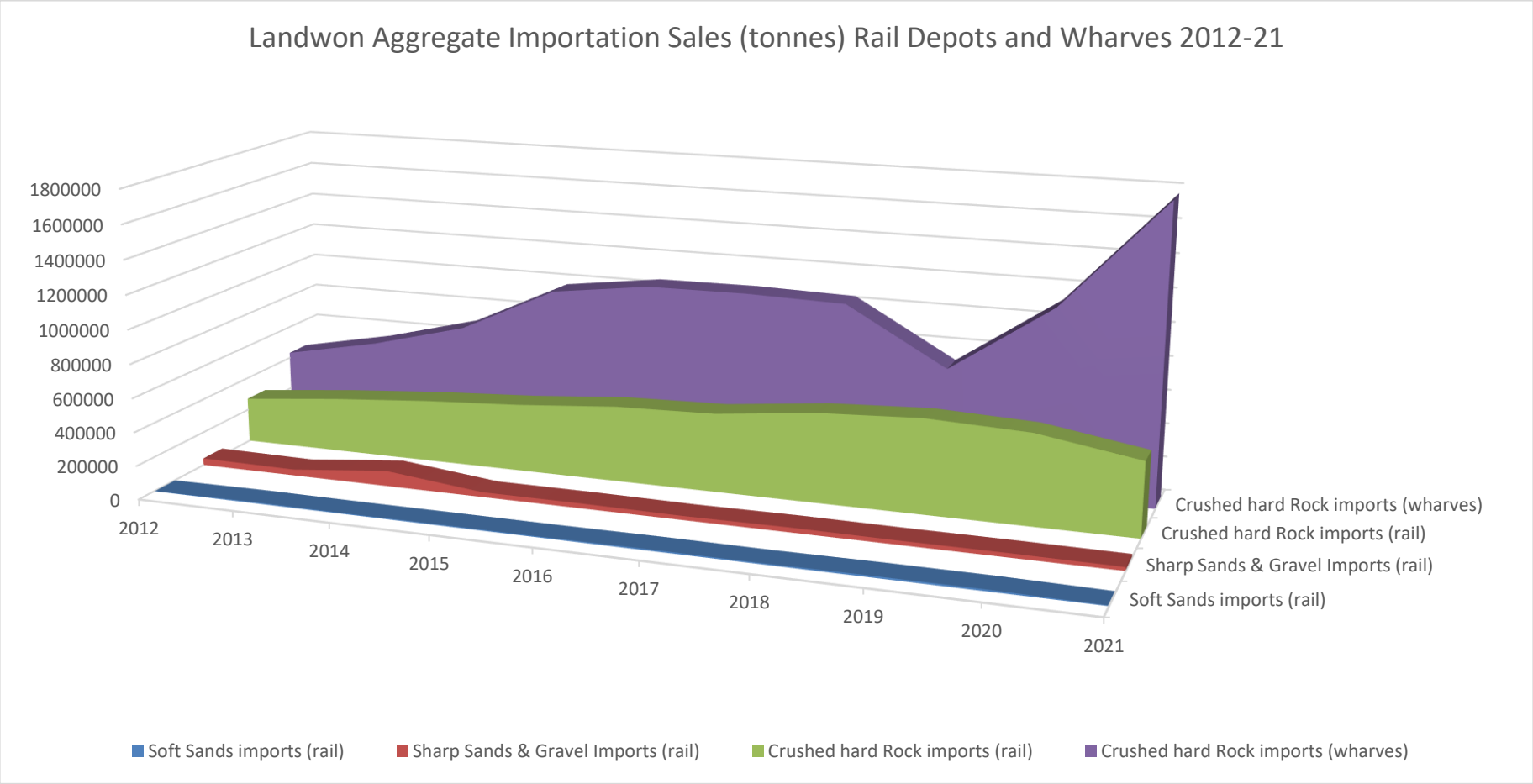
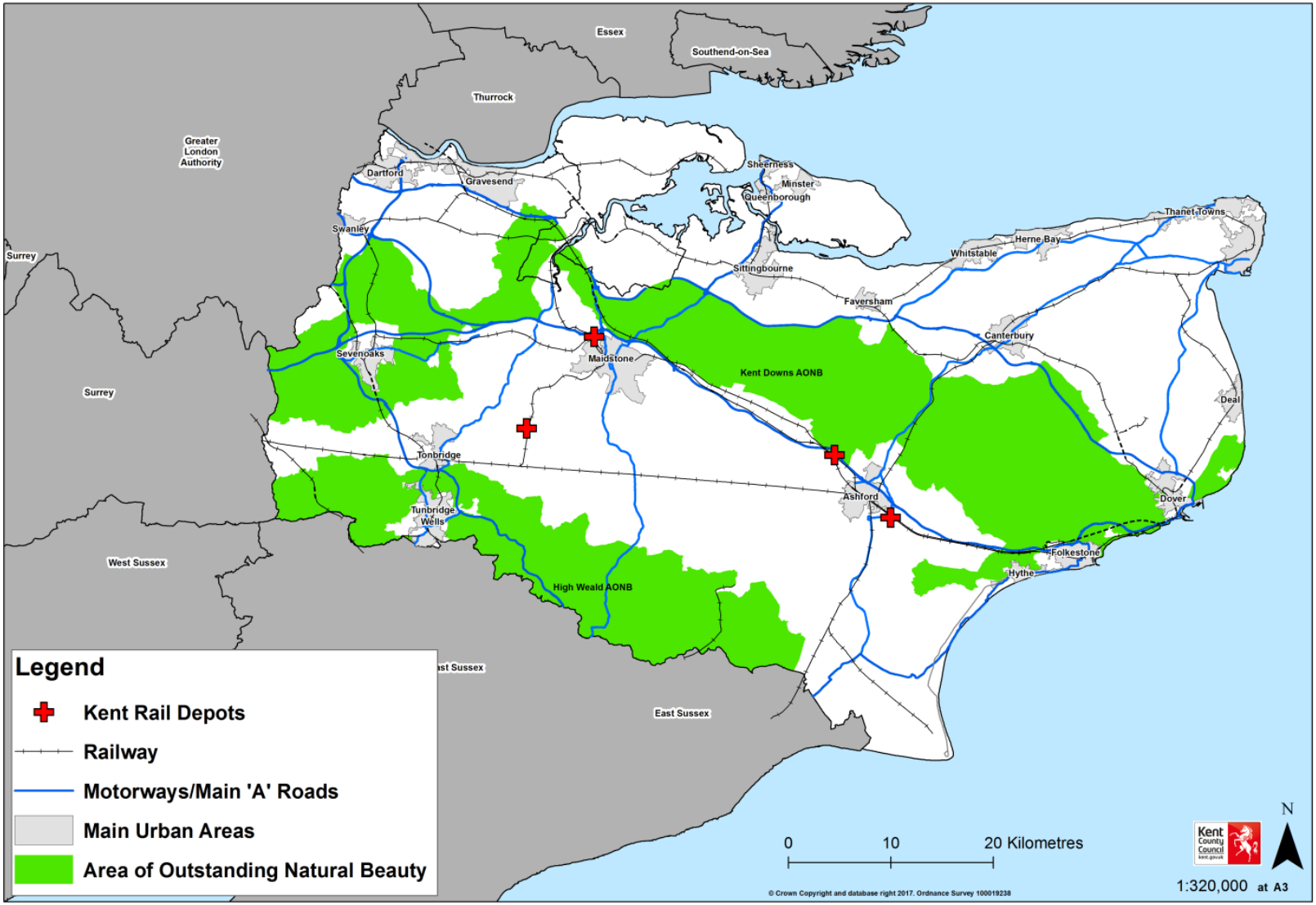


Figure 9: Location Map of Active Rail Depots in Kent



6.0 Total Aggregate Production in Kent in 2012-2021

6.1 During 2021 the total primary and recycled/secondary aggregate production (sales) (including imports) in Kent were as shown in Table 10 below. The landwon sand and gravel 'hoggin' type material sales for construction fill are not included in Table 10, though are in the Dashboard on pages iii to vii, resulting in a slightly lower overall sales figure.

Table 10: Total Aggregate Production in Kent during 2012-2021 (Million tonnes)

Year	Soft Sands Landwon (indigenous) *	Soft Sands Imports	Sharp Sands & Gravel Land-won (indigenous) *	Sharp Sands & Gravel Imports $	Crushed Rock landwon (indigenous)	Crushed Rock Imports	Secondary/ Recycled Aggregates	Totals
2012	0.39	0.0230	0.65	2.18	0.53	0.70	0.67	**5.40**
2013	0.48	0.0152	0.27	1.77	0.72	0.87	0.84	**5.00**
2014	0.29	0.0098	0.17	1.97	0.77	1.07	0.73	**5.02**
2015	0.48	0.0288	0.24	2.06	0.73	1.38	0.84	**5.77**
2016	0.51	0.0079	0.26	2.05	0.81	1.50	1.03	**6.14**
2017	0.52	0.0098	0.15	2.19	0.82	1.53	0.91	**6.09**
2018	0.49	0.0326	0.12	2.07	0.90	1.58	0.76	**5.83**
2019	0.42	0.0100	0.08	0.633	1.00	1.27	0.42	**3.61**
2020	0.39	0.0100	0.13	1.442	1.51	1.66	0.91	**5.32**
2021	0.59	0.0050	0.20	1.663	0.81	2.21	0.99	**6.47**
Total 2012-21	**4.56**	**0.1521**	**2.27**	**18.03**	**8.56**	**13.77**	**8.10**	**10-year average 5.46**
Last 3-year average	**0.466**	**0.0083**	**0.136**	**1.246**	**1.10**	**1.713**	**0.77**	**3-year average 5.134**
Last 10-year average	**0.456**	**0.0152**	**0.228**	**1.803**	**0.86**	**1.377**	**0.81**	

Source: Aggregate Monitoring Surveys, 2012-2021. $ 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 10 does not demonstrate actual consumption of aggregates within Kent, as it is a reasonable assumption that a degree of exportation out of Kent occurred to other areas. In addition, importation by road is not picked up by the AM surveys conducted by MPA's during this period. Comprehensive surveys of imports and exports undertaken by BGS, that can reveal aggregate consumption (to a reasonable degree of accuracy), were completed in in 2009, 2014 and most recently in 2019. The 2014 study confirmed that Kent and Medway are the most significant in terms of sales from wharfs and are particularly dominant with regard to imported crushed rock.[10]

6.3 The BGS 2019 data showed that Kent consumes typically 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. The data did not disaggregate between soft sand and sharp sands and gravels and thus cannot be used to determine how these different materials serve 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. The BGS 2019 data has been used to inform a national aggregate monitoring report in which Kent's role in supply beyond its boundaries is demonstrated.

6.4 Imports of sharp sand and gravel in 2021 (1.663mt) increased again, though they remain below the 10-year average of 1.803mt. Imports of crushed rock in 2021 (2.21mt) were greater again than the 10-year average (1.37mt). The important observation is that, apart from soft sands, all sales of primary aggregates imported into Kent are increasing.

6.5 Soft sand imports (either marine or landwon) remain insignificant. Landwon soft sand supply from Kent has increased, though reserves have contracted, the 10 and 3-year sales averages are still generally comparable. Overall landwon sand and gravel is in depletion and landwon crushed rock sales have contracted from 1.5mtpa in 2020 to a more historically representative level of 0.815mtpa. The 3-year average (a slight contraction to 1.104mtpa) is significantly greater than the 10-year sales average of 0.857mtpa.

[10] https://documents.hants.gov.uk/see-awp/SEEAWP-annual-report-2018.pdf

6.6 Similarly, recycled/secondary aggregates sales showed a significant increase to 0.91mtpa in 2020, well above the 10-year average of 0.688mtpa.

6.7 Importation across all primary aggregate types has increased again to 3.88mtpa in 2021. Indicating an increasing importance in this form of supply.

6.8 Imports of sharp sand and gravel in 2020 (1.442mt) grew in 2021 to 1.663mt, though the 10-year average (1.803mt) slightly decreased. However, importation remains the dominant form of sand and gravel supply. This is not anticipated to change, in fact due to the landwon sector being ii obvious decline, it is anticipated to increase into the future, particularly the marine dredged sector. In 2021 overall aggregate sales in Kent were 6.47mt, up from 5.32mt in 2020. The marked recovery from the dip in sales in 2019 is continuing.

6.9 Figure 10 shows total aggregate (all types) sales and Figures 11 and 11a below illustrates the separate primary aggregate type sales in Kent from 2012 to 2021 graphically.

Figure 10: Total Aggregate Production (Sales) in Kent during 2012-2021 (tonnes)

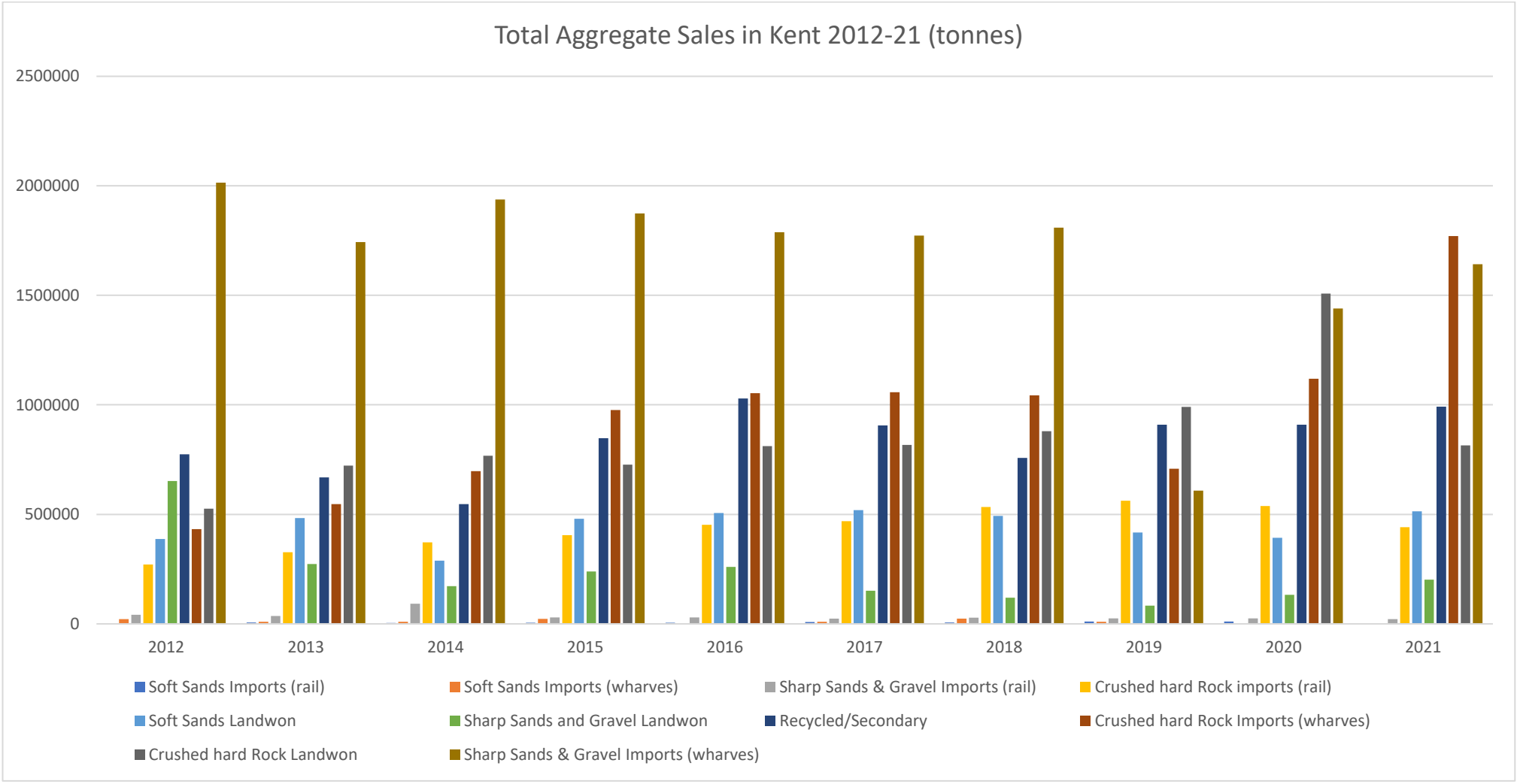


Figure 11: Total Primary Aggregate Production in Kent during 2012-2021 (tonnes)

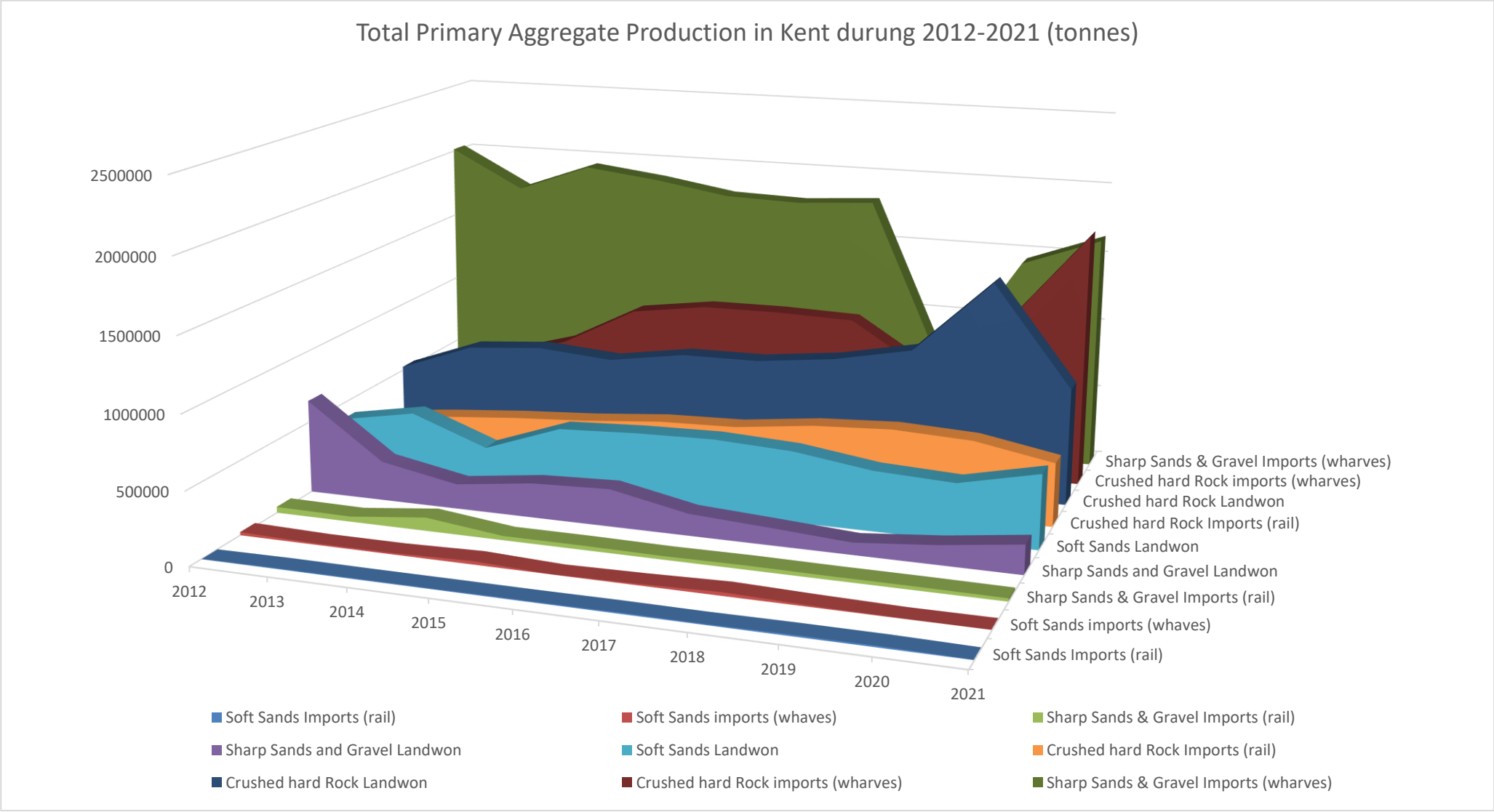
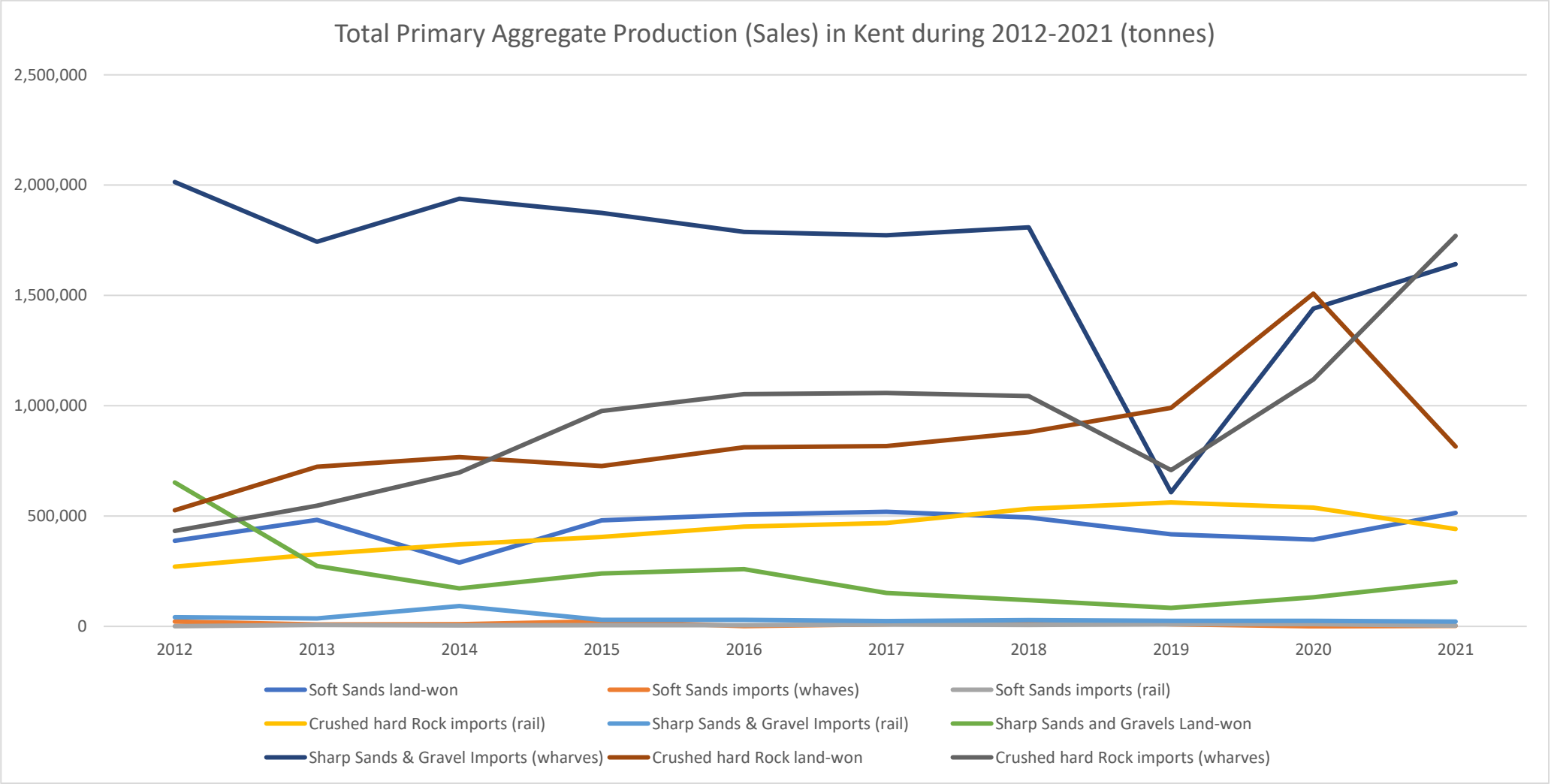


Figure 11a: Total Primary Aggregate Production in Kent during 2012-2021 (tonnes)



6.10 The economic uncertainty caused by the UK's exit from the European Union (EU) may explain why in 2019 aggregate importation and the utilisation of recycled and secondary aggregates experienced contraction. This appears to be reversing given the 2020 and 2021 sales data. Landwon soft sand sales also experienced contraction, but of a lower degree of magnitude, and are now showing some recovery. The landwon sales of crushed rock, for the reasons given above, were the beneficiary of very local circumstances in Kent, and have returned to a more historical level of sales.

7.0 Future Aggregate Supply

7.1 Such matters as housing supply and other development are linked to aggregate requirements, as are infrastructure projects and infrastructure maintenance. Though a direct relationship between sales and construction in one Mineral Planning Authority (MPA) area is unlikely to be probable, given imports and exports into and out of any given MPA also occur. Though an examination of the main construction predictions can possibly *indicate* whether aggregate needs are likely to grow or decline, over any given Plan period. The 2021 housing targets and infrastructure projects (anticipated until 2040) are shown on Table 11 below.

Table 11: 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 was revised by 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, or 10,851 per annum. This was revised in November 2020 and increased to **225,000** dwellings to be required between 2019 and 2039, 11,250 per annum. An increase of 3.5% over the 2019 estimation. The most recent Housing Led Forecast 2021 (by Kent Analytics, Kent County Council) predicts the between 2020-40 **190,398** homes will be required. This represents a fall off of housing requirements based on analysis of the demographic data from the Office of National Statistics (ONS). However, in addition, Ebbsfleet Garden City exists within Kent which is a planned development of up to **15,000** homes and 45,000m^2 of commercial floor space.

<table>
<tr><td>Education</td><td><table>
<tr><td>2020-24

Primary 12.8FE

Secondary 58 FE</td><td>2024-28

Primary 26.6 FE

Secondary 21 FE</td><td>2028-30

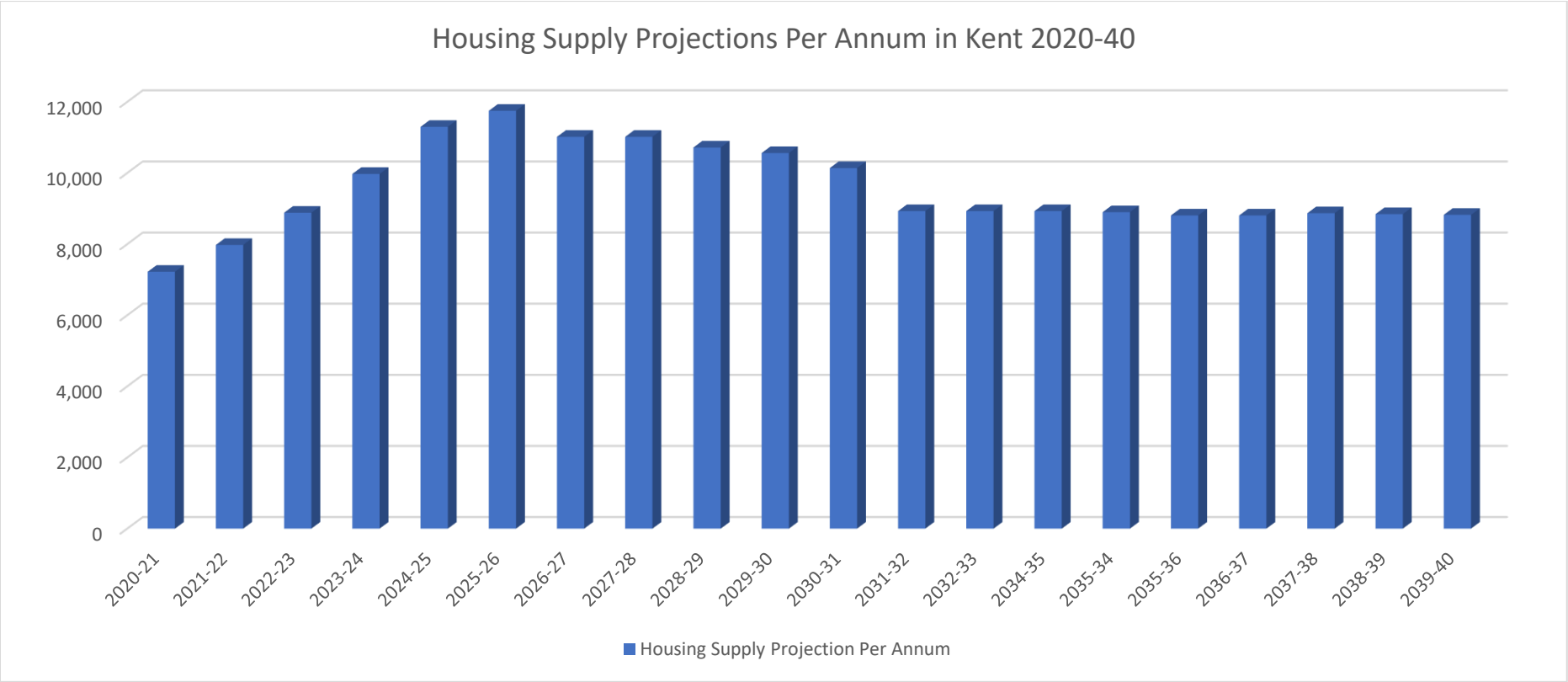
Primary 11 FE

Secondary 8 FE</td><td>2030-38

No data</td></tr>
</table></td></tr>
<tr><td>Infrastructure</td><td>Significant Infrastructure Up to 2030 in Kent
A2 Bean and Ebbsfleet Junctions
Lower Thames Crossing
Motorway Junction Improvements (M20 Junctions 3-5, 10a, M2 Junctions 5,7)
Bifurcation of Port Traffic and Ports Expansion (Dover Western Docks significantly, including potentially Large Local Major (LLM) funding schemes for A229
Solution to Operation Stack and Overnight Lorry Parking
Rail improvements to Thanet
Crossrail Extension</td></tr>
</table>

7.2 The planned level of dwellings to 2040 has decreased since LAA2021 from 225,000 to 190,398. Figure 12 below shows the latest per annum (pa) predicted requirements. Essentially the pressure on housing growth, while evident to 2026 then starts to fall markedly to just above 8,000 pa 2031 and remains at this level to the 2040 horizon.

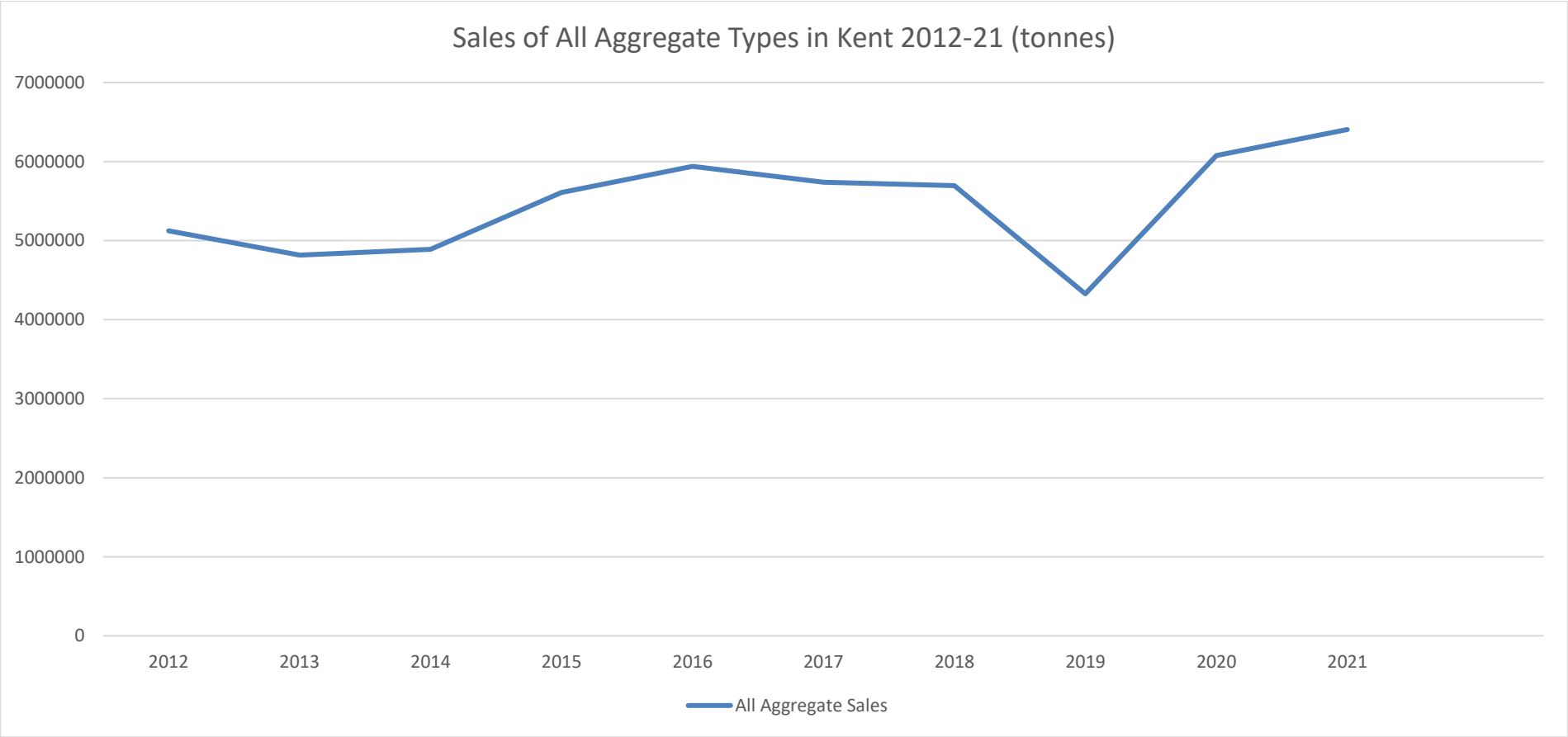
Figure 12: New Housing Growth Per Annum Requirement Predictions in Kent 2020-40



7.3 In addition to the above the Ebbsfleet Garden City (a planned development) will add a further 15,000 homes to the overall total that will require an increase in overall aggregate supply. However, the overall magnitude of housing growth compared to previous monitoring periods is now one of predicted decline over the entire period 2020-40. This will have a corresponding reduction in aggregate material demand, given that aggregates are still significantly used in the construction (and maintenance) of the housing stock.

7.4 The demand projections in infrastructural development, as reported in LAA2020 have not significantly altered. They include port expansion, east Kent rail connections and major highway schemes (A2 and motorway junction improvements) additional to the planned Lower Thames Crossing. As stated in previous 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. The demand for aggregates overall in Kent for house building, construction and concrete products for infrastructure development and maintenance and major projects is showing a marked recovery from a 2019 fall off of sales of most aggregate types. Though the gradient in the sales data from 2020 to 2021 has slightly reduced (as shown in Figure 16) as it is showing an increase in sales but of a lower intensity than between 2019 to 2020. Thus, the characteristic of a marked steep recovery from the recorded exceptionally low level of sales during 2019 showed a levelling off in 2021. While it is concluded that there are no local construction indicators, such as housing etc described above that indicate a likelihood of significant increases in the demand for construction aggregates above the 5-6.0mtpa levels observed in the past, this is not a conclusion that can be removed from a consideration of the wider regional growth estimates, that will affect aggregate demand. For example, although housing supply is estimated to grow, then fall and level off in 2031, and be below the levels of the 2020 projections, this indicator may change again. Growth, over the long term can be reasonable anticipated in the South East that will include Kent.

Figure 13: Total Aggregate (Primary and Secondary) Sales in Kent 2012-2021



7.5 Figure 13 essentially demonstrates that the low sales recorded during 2019 was an 'exceptional' and temporary event, with sales falling to just under 4.0mtpa, most probably due to pre-Brexit trading uncertainty. The rapid recovery in 2020 back to 6.0mtpa may be representing how this 'uncertainty' dissipated once the nature of the UK's departure from the European Union was made more definitive in late 2019. It is of note that landwon crushed rock did not 'suffer' this uncertainty. Sales in 2021 are showing a 'levelling off' possibly due to continue a degree of uncertainty caused by Covid 19 pandemic, though this is more speculative.

7.6 Continued monitoring will demonstrate if sales of all aggregate types fall again to under 6.0mtpa again in Kent. For the future, and the remainder of the currently adopted Plan period, it is considered that use of predictive modelling to predict the actual quantum of demand from this sales recovery upturn is unreliable at the County Council scale. The observed 'uncertainty due to Brexit' effect in 2019 and the ongoing Covid 19 pandemic effects that are possibly still working their way through the economy, that can be observed in the last three years of monitored sales data, are considered unreliable indicators of future demand. It remains the County Council's position that the use of the latest 10-year sales averages is the most reliable metric for considering demand over the remaining Plan period, as this will continue to average out the inevitable fluctuations in overall supply that have occurred and will continue to occur.

Available Permitted Reserves and Landbanks

7.7 The 2021 data (AM2021) collected for Kent shows the reserves for the following aggregate mineral types *as of the end* of 2021:

- Soft sand markedly reduced from 9,341,000 tonnes to 6,224,773 tonnes; due to an error in reserve re-evaluations in 2020;
- Sharp sands and gravel reduced from 2,779,500 tonnes to 2,564,000 tonnes which was predominantly a result of re-evaluation of reserves, as sales remain essentially low;
- Hard rock, confidentiality has been waived in LAA2021 by the operator, the overall estimation of permitted reserves (two sites, Blaise Farm and Hermitage Quarry) (now accurately modelled using 3-dimensional software surveying techniques) is 16,097,250 tonnes.

7.8 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 2021. Therefore, it is recognised that the data in 2021 needs to be recast to reflect almost another year of production that has occurred when looking forward and estimating aggregate requirements. The magnitude of which will not be known until the data for 2022 is collected by AM2022. In the meantime, the 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.

Soft Sands

7.9 With regard to the soft sands landbank, the 2012-2021 ten-year sales average is 456,345 tonnes per annum, up slightly (3.34%) from 441,038 tonnes per annum in 2020. The three-year sales trend has increased from 434,352 tonnes per annum to 467,992 tonnes per annum in 2021. The 10-year average (Kent's LAA/APR Rate) gives a landbank of 13.6 years based on a reserve of 6.2 million tonnes. The recorded sales since 2012 are shown on Table 12 below.

7.10 Soft sand sales in 2021 were 594,099 tonnes, an increase compared to a recorded low of 392,850 tonnes in 2020 (a low level of extraction not seen since 2012 when 387,746 tonnes of sales were recorded). It may be that sales are returning to the 0.5mtpa mark seen between 2015 to 2018. However, a combination of the previous uncertainty regarding the UK's exit from the European Union and in early 2020 cessation of construction activity during the Covid-19 pandemic 'lock downs' (March to June 2020), are still recent impacts. Current economic predictions are for the UK to experience low growth (possibly negative) of gross domestic product (GDP). This coupled with lower housing projections to 2040 than 2020 forecasts may limit the need for substantial increased supply of soft sand over the adopted Plan period and beyond to 2040. Further monitoring will determine if higher levels of demand returns, and sales regain the levels seen in 2015-2018. Table 12 below details the soft sand sales 2012-2021.

Table 12: Landwon Aggregates Sales - Soft Sands 2012-21

Year	Sales (Tonnes)
2012	387,746
2013	483,165
2014	289,087
2015	480,215
2016	506,663
2017	519,414
2018	493,179
2019	417,027
2020	392,850
2021	594,099

Sales Averages
10-year Sales Average (2012-21) 0.456mtpa
3-year Sales Average (2012-21) 0.468mtpa

Sharp Sands and Gravel

7.11 The marked decline in overall reserves from 3.18mt in 2019, to 2.78mt tonnes in 2020 to just 1.38mt in 2021 demonstrates the decreasing importance of this form of supply. In 2021 there was again no replenishment in the form of additional planning permissions. Correspondingly available reserves are set to continue to decline.

7.12 Recorded sales in 2021 were 202,022 tonnes, a significant increase from 2020 when 132,231 tonnes were sold. The ten-year sales average decreased to 228,526 tonnes from 270,309 tonnes in 2020. The landwon sharp sand and gravel landbank based on the last 10-year sales (the Kent LAA/APR Rate) average is currently only 6.05 years. Given that this is a depleting resource, this landbank is a reflection of declining sales rather than one that is with almost sufficient to meet 'at least' 7-year landbank level. The reality is that supply of this type of aggregate is increasingly being met by imports. Table 13 shows recorded tonnages of sales of landwon sharp sand and gravel since 2012-21.

Table 13: Landwon Aggregates Sales Sharp Sands and Gravels 2012-21

Year	Sales (Tonnes)
2012	652,285
2013	273,000
2014	172,672
2015	239,366
2016	259,550
2017	151,165
2018	119,259
2019	83,709
2020	132,231
2021	202,022

Sales Average last 10-years (2012-21)	**228,526**
Sales Average last 3-years (2019-21)	**139,321**

Crushed Rock

7.13 Hard (crushed) rock sales records were restricted given that Kent production from the landwon resource is represented by only two sites and the SEEAWP protocol required at least three sites to aggregate sales and reserves and maintain confidentiality. The operator has waived that requirement in order for the matter of future supply to be fully understood. The sales shown in Table 14 below detail the history of landwon crushed rock sales for only the second time in an LAA report. They significantly increased to 2020, when 1.5mt was sold, far more than in any year since 2012. However, in 2021 sales have reverted to the more typical 0.8+mtpa level. The reason for the 2019-20 'high' in sales may well be due to very local circumstances that exit in Kent. The need to supply crushed rock to construct HGV parking areas in the proximity of the Port of Dover in preparation for the UK's exit from the European Union probably potentially explains these sales increases. The apparent reversion to more historical rates of sales 0.80+mt to per annum range will be revealed by future monitoring.

7.14 The (crushed) hard rock permitted landbank has been more reliably modelled using three-dimensional analysis confirming a 16.1mt total available at Hermitage Quarry and Blaise Farm Quarry combined. The use of the LAA/APR Rate of 0.856mtpa (the 10-year average) gives a NPPF maintained landbank of between almost 19 years. Essentially sufficient to meet the adopted Plan's needs to 2030 (plus 10 years) from 2021. Table 14 details the crushed (hard) rock sales 2012-2021.

Table 14: Landwon Aggregates Sales Crushed Rock 2012-21

Year	Sales (Tonnes)
2012	526,281
2013	722,985
2014	767,198
2015	727,272
2016	811,935
2017	817,437
2018	880,063

2019	990,590
2020	1,508,239
2021	814,859
Average last 10-years (2012-21)	**856,686**
Average last 3-years (2019-21)	**1,104,563**

Future Potential Requirements and Resources

7.15 The County Council adopted the Mineral Sites Plan in September 2020. It identifies the required future resources to ensure a steady and adequate supply of minerals (in the form of 7- and 10-year aggregate landbanks for sands and gravels and crushed (hard) rock respectively) until 2030. There was a Call for Sites exercise in late 2016 into early 2017 that resulted in several sites coming forward (though none for hard rock that could be crushed to give rise to a graded aggregate). The County Council proceeded on the basis that there was a requirement to identify additional potential reserves of soft sand and sharp sand and gravel, but not hard crushed rock reserves. The latter were determined to have sufficient reserves for the remainder of the Plan period and beyond. The County Council initially assessed the sites promoted that accord with the objectives of the adopted Kent Minerals and Waste Local Plan 2013-30. 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).

7.16 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 12 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 and were included as allocations in the Kent Mineral Sites Plan subsequently adopted in 2020. Table 15 overleaf details the sites considered by this local plan process.

Table 15: Mineral Sites Plan (adopted 2020) Sites for Landwon Aggregates

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

7.17 The Mineral Sites Plan was subjected to Independent Examination by an Inspector of the Planning Inspectorate; this included hearings during October 2019. A number of Main and Additional Modifications were promoted and consulted[11] upon as part of the Mineral Sites Plan examination. The Mineral Sites Plan was not modified to include any additional sites or any further reduction in sites from the three allocations proposed as shown on Table 12 above. The Inspector's report was received by the County Council in the Spring of 2020, with full adoption by the County Council occurring in September 2020. None of the sites allocated have yet received planning permission, nor have any applications been lodged for their development to date.

[11] 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

Sharp Sand and Gravel

7.18 With regard to the sharp sands and gravel, it is recognised that the landbank is under the NPPF 7 year minimum. The observed fall in sales since 2016 was significantly due to the production from a notable site moving over the Kent administrative boundary into East Sussex. Production continued and served both the Kent and East Sussex markets, and now the AM returns for 2020 and 2021 reflects that actuality, though for several AM monitoring reports this fact was not recorded. However, the matter is now somewhat academic. Total reserves are 1.384 million tonnes, and the real rate of need is, in all probability higher than the LAA Rate of 0.228mtpa based on the 10-year sales average. Therefore, it remains the case that the need to plan for additional resources is justified. However, it should also be noted that the requirements of the adopted Kent Minerals and Waste Local Plan (Policy CSM 2), that were to be addressed in the Kent Mineral Sites Plan, require significantly greater quantities of sharp sand and gravel aggregates than the combined reserves of 2021 and the sites allocated in the Mineral Sites Plan, though only *"…while resources allow*."

7.19 This position is due to the recognition that the landwon sands and gravels are a depleting resource in Kent. Therefore, the additional 2.5 million tonnes (two sites) that were allocated in the Mineral Sites Plan would not meet the KMWLP identified needs over the remaining Plan period, 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). The essential position considered by the Independent Examination of the Mineral Sites Plan has not altered, that as the landwon sharp sand and gravel resources are further depleted, other resources (mainly marine dredged and recycled and secondary aggregate materials) will now increasingly become more important in the overall supply mix to meet need.

Soft Sands

7.20 Existing reserves of soft sand have undergone further re-evaluation and are (end of 2021) reduced to 6.22mt. This compares to those reported in 2020 as having increased to 9.34mt from 7.8mt reported in 2019. The 10-year sales average has slightly increased, this and the reduced reserve base means that there are insufficient reserves to meet the KMWLP soft sand requirements (to 2030 + 7 years). However, the soft sand requirements should be considered in the context of:

a. the allocated site that has 3.2mt of potential reserves (Chapel Farm) and
b. the update of the Kent Minerals Local Plan 2013-30 that involves a new 15-year Plan period from 2023 to 2038.

7.21 The following soft sand requirements for the anticipated change in plan period are calculated below:

- Estimated reserves at the end of 2021 (the latest AM/LAA unpublished figure) are now 6,224,773
- 10-year sales average is 0.456mtpa (the LAA/APR rate)
- Plan period (2023 to 2038) is 15 years plus 7 for the maintained 7-year land bank at the end of the Plan period, total time = 22 years

Reserves at the beginning of 2023 will be:

- At end 2022 (i.e. beginning of 2023): 6.225mt - 0.456mt = 5.769mt

Plan requirement over the plan period 2023 to 2038 + 7 (15 + 7 = 22 years) equates to (22 x 0.456 = 10.032mt) 10.032mt.

Therefore, the shortfall over the Plan period of 2023 to end of 2037 + 7 years is the permitted, and thus available, reserves (beginning 2023) of 5.769mt minus 10.032mt (the requirements) = - 4.263mt.

Adding 3.2mt (Chapel Farm in 2029 when the reserves fall below the 7-year landbank minimum of 3.192mt) of soft sand resources reduces the **anticipated shortfall to 1.063mt over the anticipated Plan period**.

The reserve draw down is illustrated as follows:

Year	**Reserves in beginning of year mt**	**Drawdown 10-year sales average**
2023	5.769	5.769-0.456=5.313
2024	5.313	5.313-0.456=4.857
2025	4.857	4.857-0.456=4.401
2026	4.401	4.401-0.456=3.945

2027	3.945	3.945-0.456=3.489
2028	3.489	3.489-0.456=3.033
2029	3.033+3.20[12]=6.233	6.233-0.456=5.777
2030	5.777	5.777-0.456=5.321
2031	5.321	5.321-0.456=4.865
2032	4.865	4.865-0.456=4.409
2033	4.409	4.409-0.456=3.953
2034	3.953	3.953-0.456=3.497
2035	3.497	3.497-0.456=3.041
2036	3.041	3.041-0.456=2.585
2037 end of Plan period, at year end	2.585	2.585-0.456=2.129 [shortfall of 1.063]
2038	2.129	2.129-0.456=1.673
2039	1.673	1.673-0.456=1.217
2040	1.217	1.217-0.456=0.761
2041	0.761	0.761-0.456=0.305
2042	0.305	0.305-0.456= -0.151
2043	0 (Reserves fully depleted)	
2044 end of Plan period +7	0	
2045		

7.22 The anticipated extended Plan period ceases to have a 7-year landbank minimum in year 2036 and the resulting deficit of 1.063mt of the overall requirements occurs at the end of 2037; the end of the anticipated extended Plan period.

Crushed Hard Rock

7.23 As the consented reserves of hard (crushable) rock of the Hythe Formation in Kent were considered as being extensive there was no need for a consideration of any future supply needs in the Mineral Sites Plan that was adopted in 2020. However, since then, the extent of the reserve base, in terms of its recent marked decline, has been clarified. There has also been a significant increase in sales. The implications of this and the extended Plan period are considered below.

[12] Chapel Farm = 3.2mt

7.24 The adequacy of the calculated landbank over the anticipated extended Plan period as assessed as follows:

- Estimated reserves at end of 2021 are 16,097,250 tonnes or 16.10mt
- 10-year sales average is 0.857mtpa
- Plan period of 15 years plus 10 for the maintained 10-year land bank at the end of the Plan period, total time = 25 years

Plan hard crushed rock requirement is therefore 0.857 x 25 = 21.425mt

Reserves at the beginning of 2023 will be:

- At the end of 2021: 16.10mt
- At the end of 2022 (beginning 2023): 16.10mt-0.857mt (the 10-year average draw down figure) = 15.243mt

The Plan requirement over 2023 to end of 2037+10 (15+10 =25 years) is 21.425mt overall (25 x 0.857=21.425mt).

Therefore, reserves of 15.242mt in 2023 minus 21.425mt (the requirement) reveals a shortfall of 6.182mt over the entire Plan period of 2023 to 38+7 years.

This 6.182mt shortfall is smaller than the current remaining total permitted reserves at Hermitage Quarry of 8.25mt, as of end of 2021.

The reserves required to maintain a 10-year landbank based on a 10 year sales average is 8.57mt

The maintained 10-year landbank ceases in 2031, with total exhaustion in 2041

The following tabulation illustrates this using the current 10-year sales average as the yearly drawdown proxy for sales:

Year	Reserves in the beginning of year mt	Drawdown 10-year sales average
2023	15.243	15.243-0.857=14.386
2024	14.386	14.386-0.857=13.529
2025	13.529	13.529-0.857=12.672
2026	12.672	12.672-0.857=11.815
2027	11.815	11.815-0.857=10.958
2028	10.958	10.958-0.857=10.101
2029	10.101	10.101-0.857=9.244
2030	9.244	9.244-0.857=8.387
2031	8.387	8.387-0.857=7.530
2032	7.530	7.530-0.857=6.673
2033	6.673	6.673-0.857=5.816
2034	5.816	5.816-0.857=4.959
2035	4.959	4.959-0.857=4.102
2036	4.102	4.102-0.857=3.245
2037 end of Plan period, at end of year	3.245	3.245-0.857=2.388 [shortfall of 6.182mt]
2038	2.388	2.388-0.857=1.531
2039	1.531	1.531-0.857=0.674
2041	0.674	0.674-0.857= -0.183
2042	0 (Reserves fully depleted)	
2043	0	
2044	0	
2045	0	
2046	0	
2047 end of plan period +10	0	

7.25 Given the anticipated extended Plan length (until end 2037 plus 10 years) there are compelling grounds for identification of further hard rock resources. The review of the Mineral Site Plan (anticipated in 2025) should include allocations for hard (crushed) rock to enable a steady and adequate supply of hard (crushed) rock over the anticipated extended KMWL Plan period. This would enable the County Council to ensure landwon hard crushed rock is in sufficient supply to meet objectively assessed needs into the future.

Productive Capacity

7.26 The monitoring survey undertaken in 2022 (AM2021 to gather 2021 data) included productive capacity of aggregate supply facilities. The understanding of capability of sites, through capacity, is a tool to be used to assist planning for future changes in demand. The latest reported productive capacities are shown in Table 16 below.

Table 16: Total Sales and Estimated Production Capacity 2021 (million tonnes per annum)

For year 2021	Sales (mt)	Productive Capacity (mtpa)	% Sales/ Production Capacity (reported)
Landwon Aggregate			
• *Soft Sands*	0.594	1.045mtpa	57%
• *Sharp Sands and Gravels*	0.202	0.75mtpa	27%
• *Crushed Rock*	0.815	2.0mtpa	41%
Wharves	3.414	5.6mtpa	61%
Rail Depots	0.466	6.34mtpa	7%
Recycling/Secondary	0.992	4.0mtpa (the reported 1.88mtpa of AM2021 is considered unrepresentative)	25%

Source: Aggregate Monitoring Survey, 2021 and previous wharf capacity work (2010) undertaken to support the adopted Plan

7.27 It is recognised that capacity information will become increasingly important in future years, particularly in relation to wharves and rail depots. The 2017 study[13] by the Mineral Products Association into future aggregate requirements suggests that nationally there could be a decrease in the demand for landwon aggregates over time. However, as the landwon resource depletes (as is currently occurring for sharp sand and gravels within Kent) and is substituted significantly by marine-won aggregates, productive capacity of importation facilities both individually and in total, will be increasingly important indicators of the resilience of supply, analogous to landbanks within the landwon sector. Kent still has significant unused capacity in its wharfage, as it is operating at approximately

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

60% capacity at the end of 2021 (leaving 40% headroom). However, loss of any wharf site will be, largely, irreplaceable and so others will need to increase their throughputs. Ignoring this issue as an unimportant matter neglects the consideration of the difficulties in operating facilities at a higher level of throughputs in a consistent manner. Difficulties such as shipping availability, navigation maintenance, facility repair and renewal considerations all could combine to exert stress on a wharf importation system trying to operate at a higher rate. Safeguarding of the existing wharf infrastructure will therefore remain a central requirement to maintain supply as the landwon sand and gravel sector eventually becomes irrelevant.

7.28 Although rail importation has even more potential to increase throughput, with some 93% of available capacity being apparently unused, rail connectivity remains, like wharf location, somewhat fixed. Though their full potential is underutilised they are in Kent's hinterland and play a role in providing importation, particularly hard rock, away from the coastal locations. Therefore, rail depots in Kent should continue to be safeguarded, such that their operational capacity can ramped up as necessary to compensate for declining landwon supplies and allowing for importation to occur in Kent's hinterland.

7.28 The secondary and recycled aggregates are showing another decrease in sales, and there is significant capacity to be further utilised if sufficient market demand ramps up production in this sector.

7.29 Landwon soft sand extraction capacity remains below its full productive potential by 43%, this shows that the sector, can still increase supply if this important mineral resource is required to respond to any uplift in future demand. Though, how far this will need to realised, given a potential slowdown in the economy and lower housing growth projections to 2040, is a matter of conjecture at this time. Further monitoring will establish how this aggregate supply responds to demand.

7.30 Landwon hard crushed rock extraction has returned to its below stated productive capacity levels. This will enable the landwon hard rock sector to again increase throughputs if demand were to rise to exceptional levels seen in 2019-20. The reserve levels are now becoming more attenuated and maintaining a steady and adequate level of supply is less to do with productive capacity than it is related to availability of reserves.

8.0 Overall Conclusions of the Local Aggregate Assessment

8.1 This LAA is based upon data for 2021. It highlights that Kent is producing slightly more aggregate overall in 2021, at 6.47mt, than 2020 (5.32mt). This increase indicates the sector continued to recover from the low recorded in 2019 (3.61mt).

8.2 The landwon sharp sands and gravels continue to decline as a share of overall supply, and the importance of importation, primarily via wharves, appears now set to be the pattern for future supply of this type of material, as marine dredged sands and gravels are largely (if not exactly in particulate size distribution) like landwon deposits. As they are part of an active and dynamic sedimentary basin, rather than as laid down fixed deposits at the end of the last (Pleistocene epoch) glaciation.

8.3 The landwon soft sands have remaining capacity headroom and the reserves have contracted on revaluation. Thus, if sales again increase to be substantially above the 0.50mtpa the sector can respond, though there is a predicted shortfall over the anticipated extended KMWLP Plan period (to 2038). However, this is at the end of this plan period. This together with the anticipated economic slowdown seen in low GDP growth at present, and lower than previously forecast housing projections, may act to depress demand. Therefore, further monitoring of the soft sand supply sector will demonstrate if any further allocations will be required by the time the existing provision for soft sand in the Kent Minerals Sites Plan (adopted in 2020) will have to be formally reviewed in 2025. At present there is no compelling requirement to conduct an early partially review of the Mineral Sites Plan for further soft sand allocations.

8.4 Landwon hard (crushed rock) has undergone a marked change from the position reported in previous LAAs. The landbank has significantly reduced to 16.10mt. The rate of extraction in 2019 and into 2020 that had significantly increased, has fallen back to more historically recognisable levels of 0.80+mtpa. However, it is clear now that there are insufficient reserves for the remaining KMWLP period or indeed the anticipated extended Plan period. Further resources are required as allocations in a revised Mineral Sites Plan in order to maintain a steady and adequate supply of hard crushed landwon aggregate in accordance with NPPF requirements to 2037/8.

8.5 The recycled and secondary aggregates that demonstrated a marked fall in sales in 2019 and had recovered by 2020 are now almost 1.0mtpa as of 2021. Indicating the growing importance of the sector, that is considered ‘under reported’ in aggregate

monitoring. Productive capacity is thought also to be relatively poorly reported and is probably in the 4+ mtpa range. Any significant increase of supply from this sector, however, is also contingent in a commensurate increase in suitable materials arising from the C, D & E waste stream. This is by no means a certainty and is related to matters of the UK's economy rather than a known resource as is the case for primary aggregate provision. Therefore, it may be that the around 1.0mtpa level of sales (as reported though this is considered an under estimation as a result of poor survey participation) is what will be generally available, and increases may be marginal. Also, it is also possible that this level of provision may decline through time as construction technology changes and the availability of suitable aggregate forming material declines. The continuing monitoring of this sector will demonstrate what is occurring in this sector of overall aggregate provision.

8.6 The importance of safeguarding wharves (significantly for marine dredged sand and gravel supply that is supplanting landwon resources) and rail depots (particularly for hard rock but apparently far less important for sand and gravel supply) as they remain an important element in maintaining overall supply into the future. This is particularly the case with the landwon sharp sands and gravels that have now, to all intents and purposes, have become of minor importance in overall supply terms in Kent into the future, marine dredged imports via Kent's wharves now being of far greater importance for this aggregate type. Future security of supply of this aggregate will increasingly be via imports, of which, wharfage remains the dominant importation mode. The rail depots are also of importance as they have significant underused capacity and would supply Kent's interior demand more efficiently but are fewer in number and the overall capacity is lower than that of the wharves along Kent's coast, that has a significant clustering in the lower reaches of the river Thames .