Kent County Council Local Aggregate Assessment 2023

December 2023

Contents

Dashboard Summary - Kent County Council LAA 2023 (using data for the calendar year 2022 data)

Aggregate Mineral Type (and origin: land-won, marine dredged and imports)	2022 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 2022) in tonnes or mt	LAA or APR Rate based Landbank	Productive Capacity	Local Plan Allocations	Notes
Soft Sand (excluding silica sand	574,685	0.475mt	0.52mt	⇧	⇧	0.475	5.574mt	5.574/0.475=11.73 Years	Estimated as 1.045mtpa (as reported in 2021, 2022 survey was incomplete)	Chapel Farm, Lenham 3.2mt	Soft sand supply remains dominated by the landwon sector, imports via wharves or rail depots continue to be insignificant.
Sharp Sand & Gravel (including Hoggin etic for construction fill)	124,200	0.176mt	0.153mt	⇩	⇩	0.176	2.230mt	2.230/0.176=12.67 years	Estimated as 0.75mtpa (as reported in 2021, 2022 survey was incomplete this data was not provided)	Moat Farm Tonbridge 1.5mt Stonecastle Farm Tonbridge 1.0mt	The landwon sector of supply for the sharp sand and gravels is becoming less and less important in overall supply, the extended landbank as compared to previous years is a reflection of the lowering APR, not replenishment of reserves.

All Sand & Gravel (landwon excluding Hoggin and that used for construction	687,362	0.656mt	0.690mt	⇩	⇧	0.656mt	7.804mt	7.804/0.691=11.29 Years	Estimated as 1.79 mtpa as reported in 2021 (excluding hoggin) overall the productive capacity is considered to be under reported as this data was not provided)	Chapel |Farm, Lenham 3.2mt Moat Farm Tonbridge 1.5mt Stonecastle Farm Tonbridge 1.0mt	The reporting of sales for Hoggin and that used for construction fill is essentially uncertain, so it is excluded from the landbank calculation for this aggregate mineral type, what was reported, from one site, was 0.53mt. Overall, it is clear that sales of Soft Sand dominate the landwon supply of sands and gravels as the sharp sands and gravels are on a decline path.
Crushed Rock (landwon)	1,242,839	1.018mt	1.317mt	⇧	⇩	1.240 (representing a 6-year sales average)	14.85mt	14.85/1.240=11.97 Years	Estimated as 2.0mtpa as reported in 2021 (2022 survey did not provide this data)	None currently	The 10-year sales average is considered to no longer reflect the correct APR given that there was a marked change in sales in 2017 of over 1.0mtpa. This trend continued justifying the use of a 6-year sales average for a APR.
Recycled and Secondary Aggregates	802,574	837,077	901,498	⇧	⇩	N/A	N/A	N/A	Estimated as the same as 2021, at 1.834mtpa recycled and 50ktpa secondary Total 1.884mtpa		Relatively poor participation in AM2022 was experienced

Marine Imported Sand & Gravel (excluding land-won)	1,905,621	1.663mt	1.234mt	no change	No change	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 2022 capacity is reported as 8.210mtpa, compared to 6.34mtpa in 2021	N/A	From the low point in 2019 (0.608mt) sales of importation of marine dredged sands and gravels have risen year on year to 1.905mt by 2022; a level not seen since 2014. Again, indicating the importance of wharfage in overall sharp sand and gravel supply.
Marine Imported Crushed Hard Rock	1,479,058mt	0.989mt	1.456mt	⇧	⬇	N/A	N/A	N/A		N/A	The importation of hard crushed rock via wharves has fallen back from the high of 2021 (1.77mt of sales) to 1.479mt in 2022. In 2019 they were also at a low of 0.708. Overall, the importation of hard crushed rock has from both rail depots and wharves has been above 1.5mtpa since 2016.
Rail Depot Sales (Sand & Gravel)	725 tonnes	31,069 Tonnes	15,796 tonnes	⬇	⬇	N/A	N/A	N/A		N/A	Importation from this sector remains insignificant in overall supply of this aggregate type and is showing a decline.

Rail Depot Sales (Soft Sand)	7,162 Tonnes	6,684 tonnes	6,758 Tonnes	⇧	⇩	N/A	N/A	N/A	2.225mtpa (essentially no change from previous reported capacity)	N/A	Importation from this sector remains insignificant overall for soft sand supply, though sales in 202 were higher than in 2021 (2,890 tonnes)
Rail Depot Sales (Crushed Hard Rock)	362,614 tonnes	446,207 tonnes	447,385 Tonnes	⇧	⇩	N/A	N/A	N/A		N/A	Importation from this sector remains insignificant in overall supply of this aggregate type.

Commentary	The **soft sand** reserves have been re-evaluated downwards since 2021 and reflect that the 2020 data was an over estimation that has now been more accurately evaluated. There have been no replenishments in terms of new planning permissions and the LAA/APR rate has slightly increased. The effect of this will mean an at least 7-year landbank will be maintained until an estimated period up to 2036. The emerging Local Plan period extends to 2039. The anticipated further reserves from the allocation in the adopted Kent Mineral Sites Plan, (Chapel Farm 3.2mt) will be required to achieve this landbank horizon and it is estimated that reserves will not exhaust over the extended (reviewed) plan period. There may also be 'windfall' sites of further soft sand in the region of 1.0+mt from local plan allocated sites within the Folkestone Formation over the anticipated Plan period that would further mitigate against the need to identify additional sites at this time. **Landwon sharp sand and gravels**, as has been 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 extraction and Kent based sales reduce, supply to meet demand will be increasingly met by importation, including by road. This latter importation is not captured by AM surveys. Thus, as the landbank of 12.7 years does not truly represent the demand and then consumption in Kent. The landbank is being 'extended' by a low and decreasing LAA Rate/APR as sales decrease, giving the impression of an adequate landbank existing, while the reality is that this resource in Kent is in depletion. Productive capacity in 2022 is estimated as 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 2.5mt allocations in the adopted Mineral Sites Plan 2020 will, if permitted, would make a contribution more than sufficient to meet that need identified from Kent's landwon resources, though this is unlikely to change the growing importation reliance in Kent. **Landwon crushed rock** in years prior to 2020 was a matter that remained confidential in terms of sales and available reserves; however, the operator has waived confidentiality to ensure that the matter of hard rock supply over the remainder of the adopted Plan period can be fully considered by the current Local Plan review work. The operator has undertaken a re-evaluation of the available reserves and advised that in recent years, the reported sales were an underestimation. The permitted landbank of 14.85mt is estimated to be insufficient over the anticipated review Plan period to 2039. An additional 17.4mt are required to provide for a 10-year maintained landbank over 2024-39. **Marine importation of sand and gravels** over wharves remain an essential part of overall supply; the 2019 fall off in sales was reversed in 2020 and the sector showed increases in 2021 and again in 2022 with sales increasing towards historic levels of between 1.5-2.05mt. Overall productive capacity remains essentially the same. **Rail depot** sales continue to remain relatively insignificant in overall supply terms of all aggerate types. The hard rock rail imports fell in 2021 to below 0.5mt. In 2022 they are 0.36mtpa. R**ecycled and secondary aggregate** sales fell in 2019 and recovered in 2020 and again in 2021 to almost 1mtpa. In 2022 this fell back slightly to 0.802mt. Due to consistently poor survey return engagement, this sector's contribution in overall supply is considered to have a greater productive capacity than that reported, and so the value estimated for 2020-22 is less than a theoretical maximum value of 4.0mtpa that is considered more reliable.

Executive Summary

This is the eleventh Local Aggregate Assessment (LAA) produced by Kent County Council. It is based on aggregate monitoring data for the year 2022. 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 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). For landwon hard (crushed) rock however the County Council regards the last 6-year sales average to be the appropriate determinate given a set of specific local circumstances.

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. Soft sand reserves have decreased, although 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) 2013-30 requirements in maintaining an at least 7-year landbank to 2036. The anticipated Plan period for the emerging Plan ends in 2039 and there are available reserves at this point. Given a reduced and then flatlined predicted housing trajectory to 2040, and the current economic slowdown being experienced, seeking to identify additional soft sand local plan allocations for a potential shortfall that may become apparent mid to late 2030's is considered premature at this time, particularly when you consider the potential contribution from windfall sites. The position will be reviewed regularly by the LAA process. It is also the case that the statutory required 5-year plan reviews between 2024 (the anticipated start year for the reviewed Plan) to 2039 will afford sufficient time to address any identified shortfall.

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. There is therefore a correspondingly limited potential for Kent to meet the demand from landwon resources of this aggregate type. The apparently extended life of the landbank over the anticipated local plan review period (to 2039) is more a consequence of reduced annual sales depressing the Local Aggregate Assessment Rate/Annual Proportional Rate (LAARate/APR) than that of a landbank meeting needs into the future. The

replenishment of 2.50 mt from the Minerals Sites Plan allocations (subject to 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.

The hard rock supply from the landwon resource in Kent remains significant. The reserves and their depletion rate were subject to confidentiality in the past given the lack of three operational sites. This was waived by the operator to allow for the matter of the supply of this aggregate to be reported in the LAA process and discussed in the public domain more openly. The drawdown acceleration of the reserves due to the high recent rates of extraction over the last 6-years has led to the County Council concluding that additional resources are required to maintain a steady and adequate supply of landwon crushed rock. Potential allocation(s) in a review of the Mineral Sites Plan are being considered. The Kent Minerals and Waste Local Plan 2013-30 (KMWLP) [Early Partial Review 2020] statutory fifth year review is currently being reviewed, subsequent to public consultation, to reflect this position.

Importation of sands and gravels from marine resources showed a marked decline in 2019, a recovery in 2020 that has continued into 2022. This was also a pattern displayed by hard (crushed) rock supply imported to wharves, though a slight decline in 2022 is noted. However, this pattern was not shown by rail depot importation which showed another year of reduction in primary aggregates importation. Rail importation, despite capacity continues to be underutilised, and remains relatively insignificant in overall supply terms, although 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 fairly consistent pattern of sales in 2020 at 0.90mt, in 2021 to almost 1.0 mt with a slight decline to 0.84mt in 2022. Hard crushed rock wharf importation was at a record high of 1.77mt in 2021. This has declined only marginally to 1.48mt in 2022. Rail importation of this aggregate type similarly fell back from 0.44mt in 2021 to 0.361mt in 2022. Marine sand and gravel importation is now at 1.90mt in 2022, the highest level since 2014. In 2020 it was 1.44mtpa and in 2021 it was 1.64mtpa, this steady increases potentially demonstrating that the aggregate supply industry is moving towards an importation strategy rather than one based on landwon supply for this aggregate mineral type. Rail importation of sand and gravel has all but ceased, though this may be unrepresentative of future supply given that rail importation of this aggregate mineral has been in the 25-30ktpa since 2015. Importation of soft sand remains a negligible contributor to the overall supply of this aggregate mineral compared to the dominance of the landwon supply in Kent.

It remains the County Council's view that growth predictions in housing, infrastructure delivery and maintenance and the needs of the wider south east area are only indicative at best in terms of forecasting aggregate demand. The data demonstrates that overall construction aggregate demand increased in 2020 and in 2021, although it reduced in 2022, from 6.78mt of sales to 6.54mt. 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[1] 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 the county and within its neighbouring areas that are supplied by Kent, it will necessitate a robust safeguarding regime of the mineral importation facilities if a steady and adequate supply of aggregates to meet the objectively assessed needs is to be maintained.

[1] These forecasts are based on housing data available up to 31 March 2021, and Population estimates, fertility, mortality, and migration rates provided by the Office of National Statistics up to mid-year 2020 and do not take into account the impact of COVID-19 on the population.

1.0 Introduction

1.1 The purpose of this Local Aggregate Assessment (LAA) report for 2023 which is based upon 2022 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 eleventh LAA and the sixth since the adoption of the Kent Minerals and Waste Local Plan 2013-30 in July 2016. This Plan was partially reviewed, mainly relating to waste related policies with the Kent Minerals and Waste Local Plan, Early Partial Review (KMWLP or the Plan) being adopted in 2020. The KMWLP provides the main strategic objectives for minerals (and waste) planning policy in Kent until 2030. It has reached the 7th year since adoption and is in the process of a full statutory review. A Regulation 18 public consultation on possible modifications was held in early 2022. This demonstrated that further amendment of the Plan was necessary with regard to aggregate supply, particularly for hard (crushed) rock. 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 of the KMWLP may result in the need to review the Sites Plan (an early review if prior to 2025), as a corollary effect on reviewing the KMWLP landwon aggregate mineral supply policy (CSM 2.) which is currently ongoing.

1.2 The adopted Plan sets out the quantities of aggregates to be provided over the period of the entire Plan in policy CSM 2: Supply of Land-won Minerals. This quantity is subject to change as more recent monitoring data, as reported in the annual LAAs becomes available. The LAA data 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) and as per the Plan's Early Partial Review in 2020, as required by the National Planning Policy Framework (NPPF, 2023). 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 is informed from the Annual Monitoring (AM) of aggregates sales by Kent County Council and is conducted on behalf of the South East England Aggregate Working Party (SEEAWP) for sales data in 2022. 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 anticipated emerging Plan period to 2039, this confidentiality restriction has been lifted.

2.0 Aggregate Forming Minerals

Geology of Kent

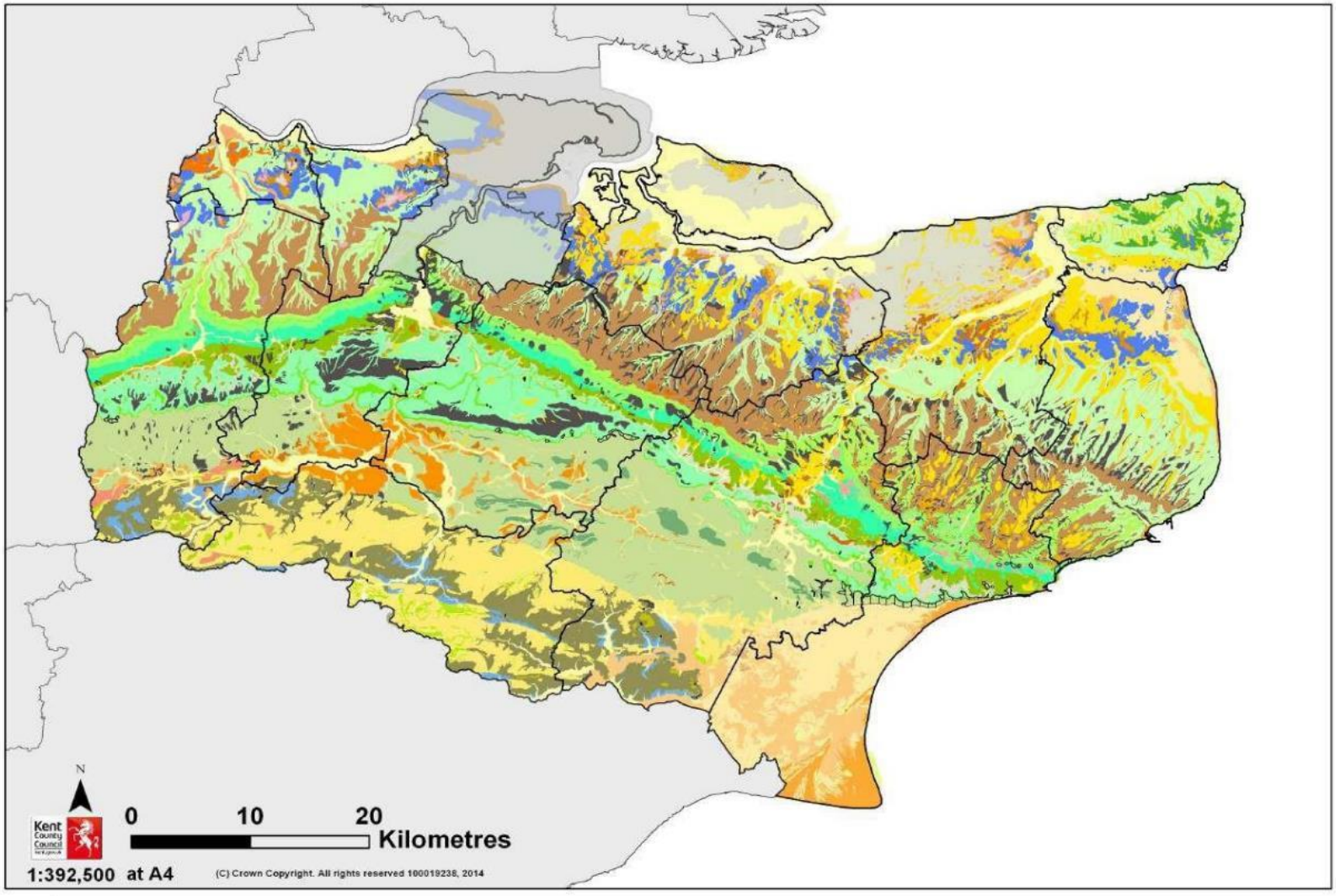
2.1 The geology of Kent is a complex array of a solid crustal stratigraphy overlaid by superficial geological deposits that are generally well mapped and understood due to previous work by the British Geological Survey (BGS), see Figure 1. Kent has several economically important naturally occurring aggregate 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 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 the 'pure' silica sands, that have fewer other mineral contaminants such as iron oxide containing minerals) 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 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 stratigraphical 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. The silica sands are found in association with the soft sands as these reflect changes in deposition, from being laid in water environments and those that are windblown (aeolian), though the nature of the material, a coastal sand deposit is not essentially different.

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 is likely to be unviable at a local scale, very possibly requiring a national and/or international market to support the necessary investment. Other economic minerals that are present in Kent, but are not aggregate forming are brickearth, clay and chalk. The LAA does not report on these materials though they are in the Authority Monitoring Report (AMR).

Figure 1: Geology of Kent both Solid and Superficial

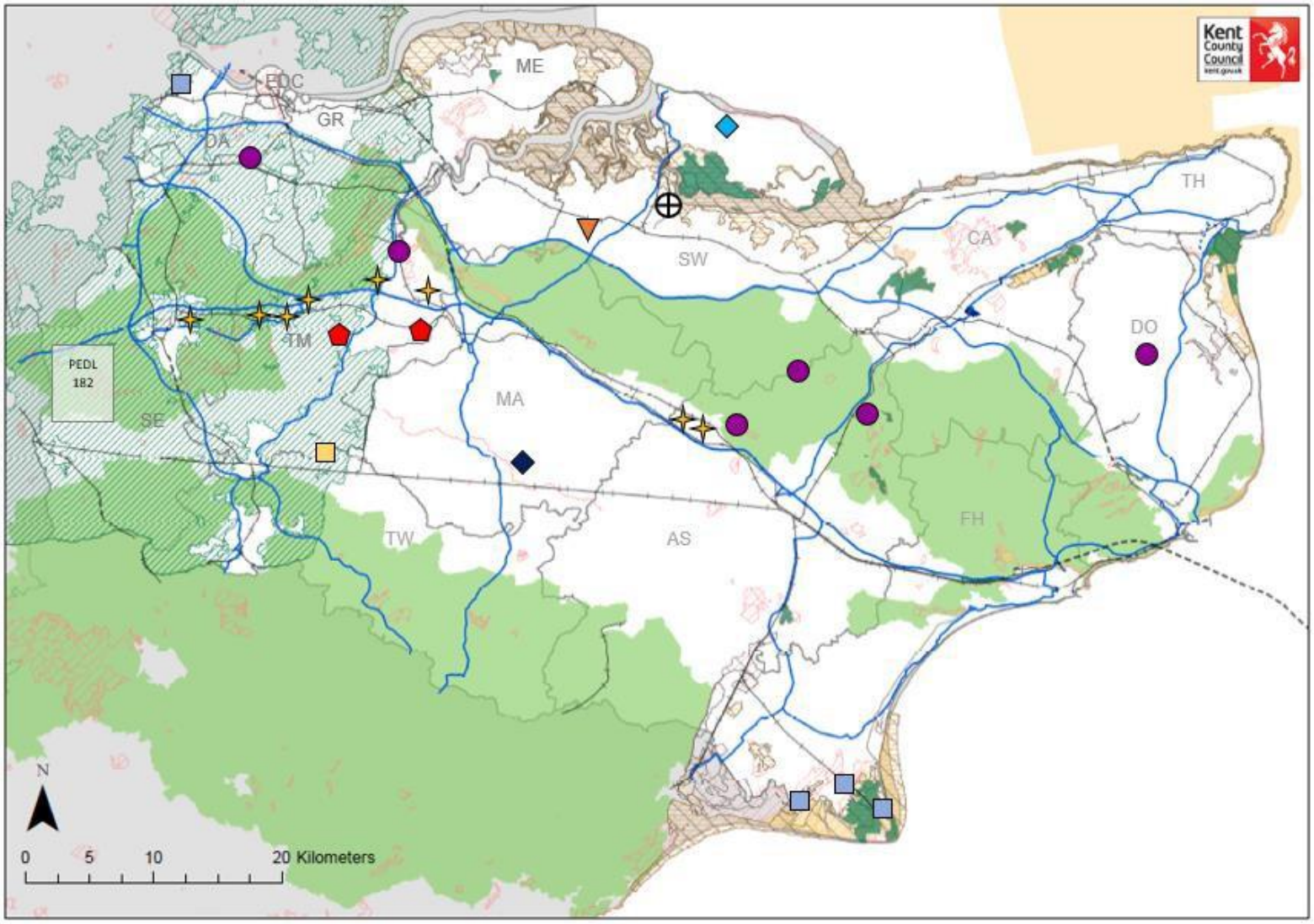


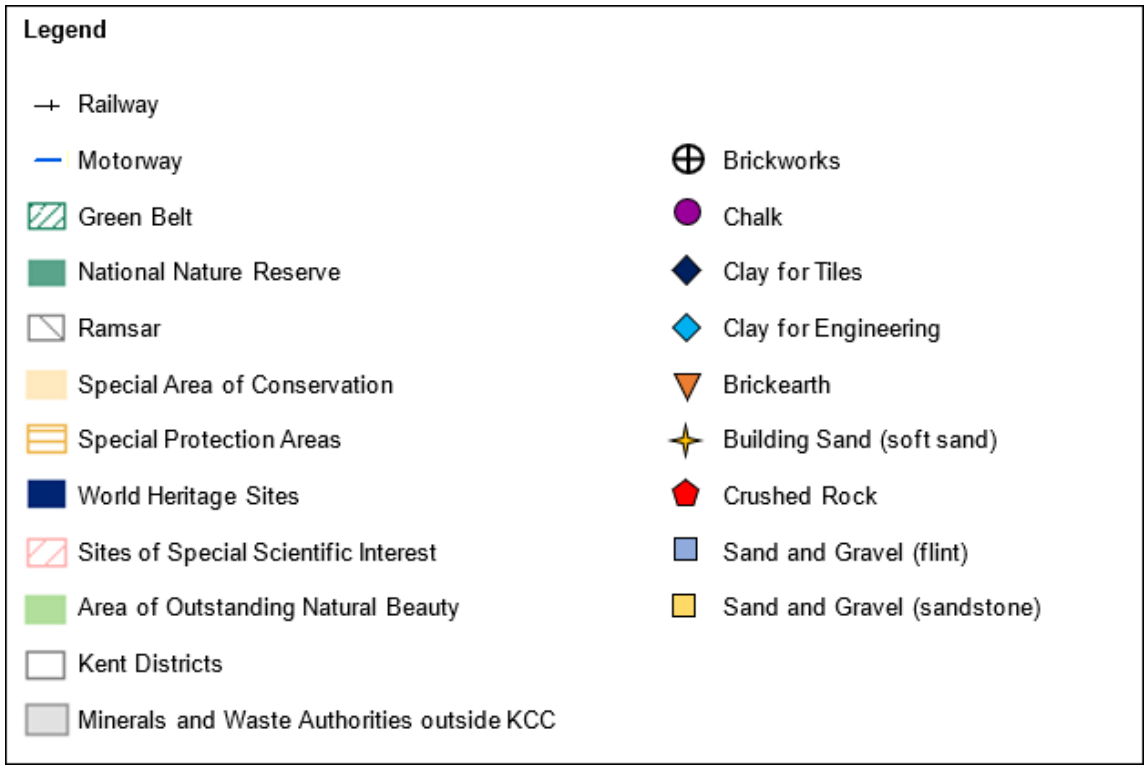
Legend: Geology of Kent

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 or active points of aggregate sales (for example Lydd Quarry plant site is still operational and sales into Kent are continuing, though the associated mineral extraction is now exclusively over the border in East Sussex) in 2022 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 two of which were operational in 2022). 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 2022. Table 1 overleaf details these sites.

Table 1: Permitted Aggregate Quarries in Kent 2022

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*
Highstead Quarry, Chislet	*Brett Aggregates Ltd*	*Yes*	-	-	*Inactive*
Denge Quarry, Lydd	Cemex UK	Yes	-	-	Active
Joyce Green Quarry, Dartford	*Ingrebourne Valley Ltd*	*Yes*	-	-	*Inactive*[3]
Aylesford Quarry, Aylesford	Aylesford Heritage Ltd	-	Yes	-	Active
Ham Hill (Snodland Quarry)	*Tarmac Ltd*		*Yes*		*Inactive*
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[4]
Ightham sandpit (H&H Celcon)	*H&H Celcon*	-	*Yes*	-	*Inactive*
Lenham Quarry, Maidstone	*Brett Aggregates Ltd*	-	*Yes*	-	*Inactive*
Nepicar Sand Quarry, Wrotham	*Nepicar* Sand Limited	-	Yes	-	Active
Greatness Farm, Sevenoaks	Tarmac Ltd	-	Yes	-	Active[5]

[2] Extraction has moved into East Sussex, the processing of material and some reserves remained in within Kent in 2022

[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 2022

[4] Inactive in 2018, early 2019 became active remains so in 2022

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

4.0 Primary Landwon Aggregate in Kent

Sands and Gravel

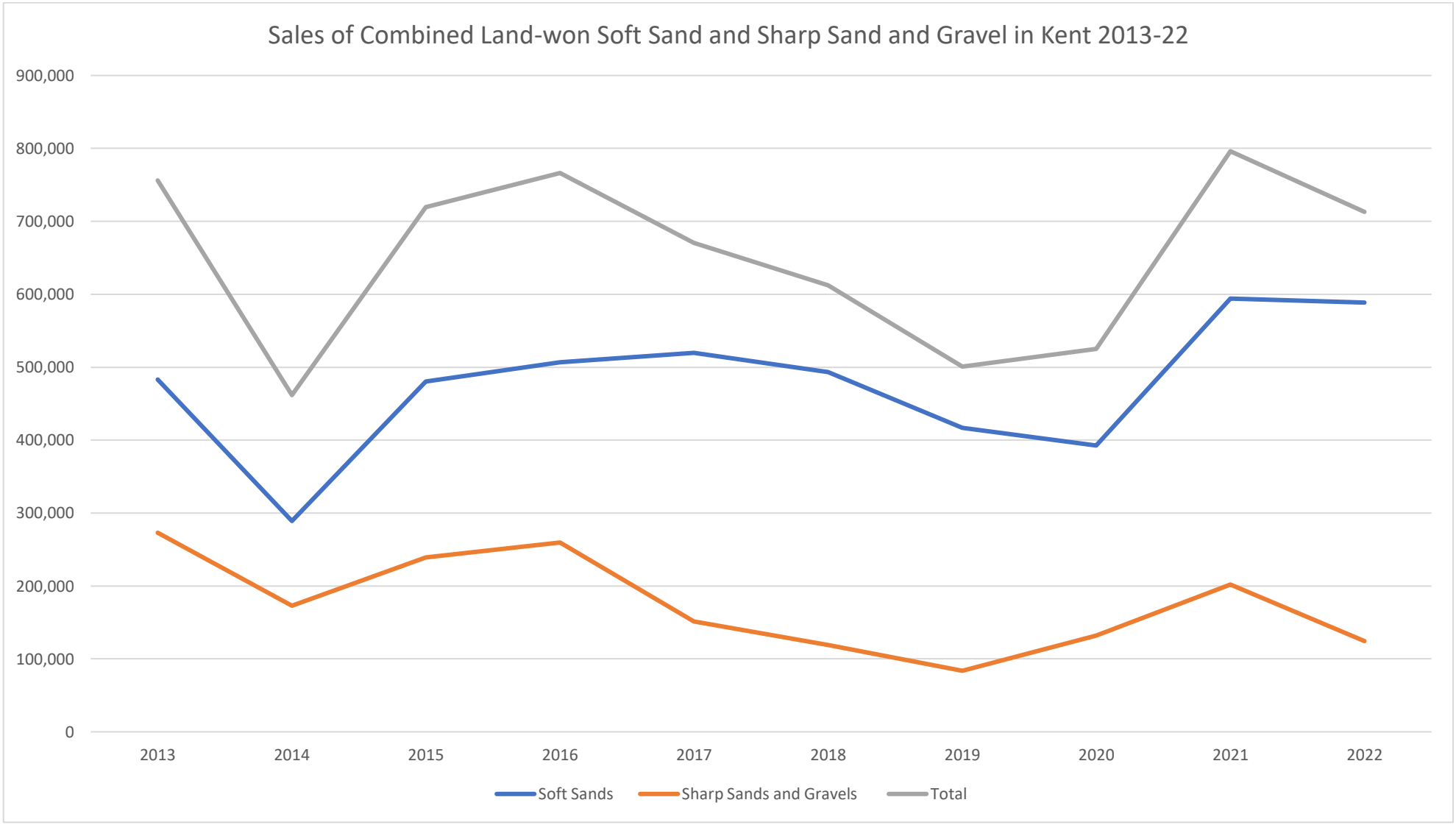
4.1 The sales of landwon sharp sand and gravel and soft sand in Kent since 2013 are shown in Table 2 and graphically in Figure 3 below. The overall, long-term trend for landwon sand and gravel aggregate is a general reduction in recorded sales, though this is significantly more pronounced for the sharp sand and gravels, that were more widely distributed and now significantly 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, 2013-2022 (tonnes)

Year	Soft Sand Tonnes	Sharp Sands and Gravel Tonnes	Totals
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
2022	588,790	124,200	712,990
Last 3-year average (2020-22)	**520,545**	**152,818**	**678,064**
Last 10-year average (2013-22)	**475,038**	**175,717**	**652,166**

Source: Aggregate Monitoring Surveys, 2013-2022

Figure 3: Sales of landwon Soft Sand and Sharp Sand and Gravel 2013-22 (Tonnes)



4.2 There was a marked fall off in sales in 2014, with sales recovering in 2015 and 2016. This recovery stalled during 2019-20 and has recovered in 2021 and 2022. The soft sand displayed sales around the 0.50mtpa level until 2018, slumped in 2019 and 2020 and recovered to 0.50+mtpa levels in 2021 and in 2022. However, the sales of the sharp sand and gravel sales have shown a dissimilar overall pattern, with a marked decline in 2014, a marginal recovery that then declined again into 2019 and then 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. They increased again to 0.202mt in 2021 only to fall again in 2022 to just 0.124mt.

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 Early Partial Review 2020 of Plan Policy CSM 2 requirements for a 5.46mt as a 7-year maintained landbank). This 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, this element of the policy which is based on data for the 2016 Plan is being reviewed as part of the current Local Plan. The recently monitored reserves (2,230,000 tonnes) in 2022 divided by the recent 10-year (2013-22) average sales data (used to define the LAA/APR rate of 0.176 mt) indicates that there is sufficient reserve for 12.67 years, greater than the 'at least' 7-years as required by the National Planning Policy Framework 2023 (NPPF). It is noted that this is insufficient for the emerging Kent Minerals and Waste Local Plan (KMWLP) plan period of 2024-2039 plus 7-years, a total of 22 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 (with no replenishing new reserves being permitted) based on both the 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 adopted 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 in terms of mineral raised in Kent, as extraction has moved into East Sussex, with apparently its last practicable reserves in Kent being underneath the existing plant site. The sales from the 'imports' from East Sussex to the Kent based processing site are counted by both mineral planning authorities as representing a 50% split of the material, as sales into Kent and East Sussex respectively.

4.5 The actual Kent overall consumption of the sharp sands and gravel material remains unrecorded by the AM process, as the actual areas where the materials are used is not required to be recorded. More detailed analysis is periodically undertaken that looks at imports and exports across the SEEAWP area that can demonstrate where consumption has occurred. Though the combining of soft sands and the sharp sands and gravels and Kent with Medway is a complicating characteristic of these surveys. This shows that the LAA Rate/APR Rate (now 0.176mtpa) 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, in all probability, being increasingly met by importation. However, given that the estimate of supply requirements in the currently adopted (and as similarly worded by its intended modification as part of the KMWLP's review) Policy CSM 2 is caveated with "…. *of at least seven years supply……will be maintained* ***while resources allow***" this is not an unexpected conclusion.

4.6 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. If the landbank life truly represented the demand, the landbank of current reserves and 2.5mt from the adopted (September 2020) Mineral Sites Plan allocations would not maintain the landbank in line with the NPPF requirements. Given the low LAA Rate/APR figure the actual and potential reserves together would result in a surplus over the extended Plan period. This is a misleading conclusion, one that reflects the diminishing importance in land-won supply.

Soft Sands

4.7 Table 3 below shows the total current (2022 data) permitted reserves, landbank and recorded sales for the period 2013-22 for the soft sands extracted in Kent.

Table 3: Landwon Soft Sand Sales and Reserves and Landbank in Kent, 2013-2022 (tonnes)

Year	Soft Sand Tonnes	Reserves as of end of 2022 (tonnes)
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	
2022	574,685	**5,573,784**
Last 3-year average (2020-22)	**520,545**	
Last 10-year average (2013-22)	**475,038**	

5 Source: Aggregate Monitoring Surveys, 2013-2022

4.8 In 2021 the sales data showed that for soft sand, this position has to a limited extent reversed with sales increased unlike those for the sharp sands and gravels. In 2022 there was a slight decline in the sales, although the 10-year average sales value (LAA Rate/APR) has marginally increased overall. The permitted reserves have shown consistent decrease from the 9.34mt recorded in 2020 to 6.225mt in 2021 and 5.57mt in 2022. We are advised that a re-evaluation error in 2020 led to an inflated overall reserve figure for that year. Moreover, the continued decline in production observed, that 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. The 2022 LAA Rate/APR shows an increase to 0.456mtpa in 2021 and 0.475mtpa in 2022. While the slight increase in the 10-year 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 11.73 years in 2022. 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.

4.9 The adopted Plan requirement spans to 2030. The review of the KMWLP has an anticipated period from 2024-2039. This is a period of 15 years, together with a 7-year landbank provision at plan end. The soft sand site 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 to at least towards the end of the anticipated Plan period. The implications of this will be discussed later in this document (see section 7.0 Future Aggregate Supply).

Crushed Rock (Hythe Formation)

4.10 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 historically exclusively so. There are now only two operational hard (crushed) rock operational sites

in Kent. In the past, confidentiality prevented a detailed report of sales. As a result, 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 former South East Plan. The mineral operator has waived their right to maintain confidentiality some time ago to enable better planning of the resource through the local plan making process. The reserves of this material were significantly boosted by the addition of a 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 respective Plan period.

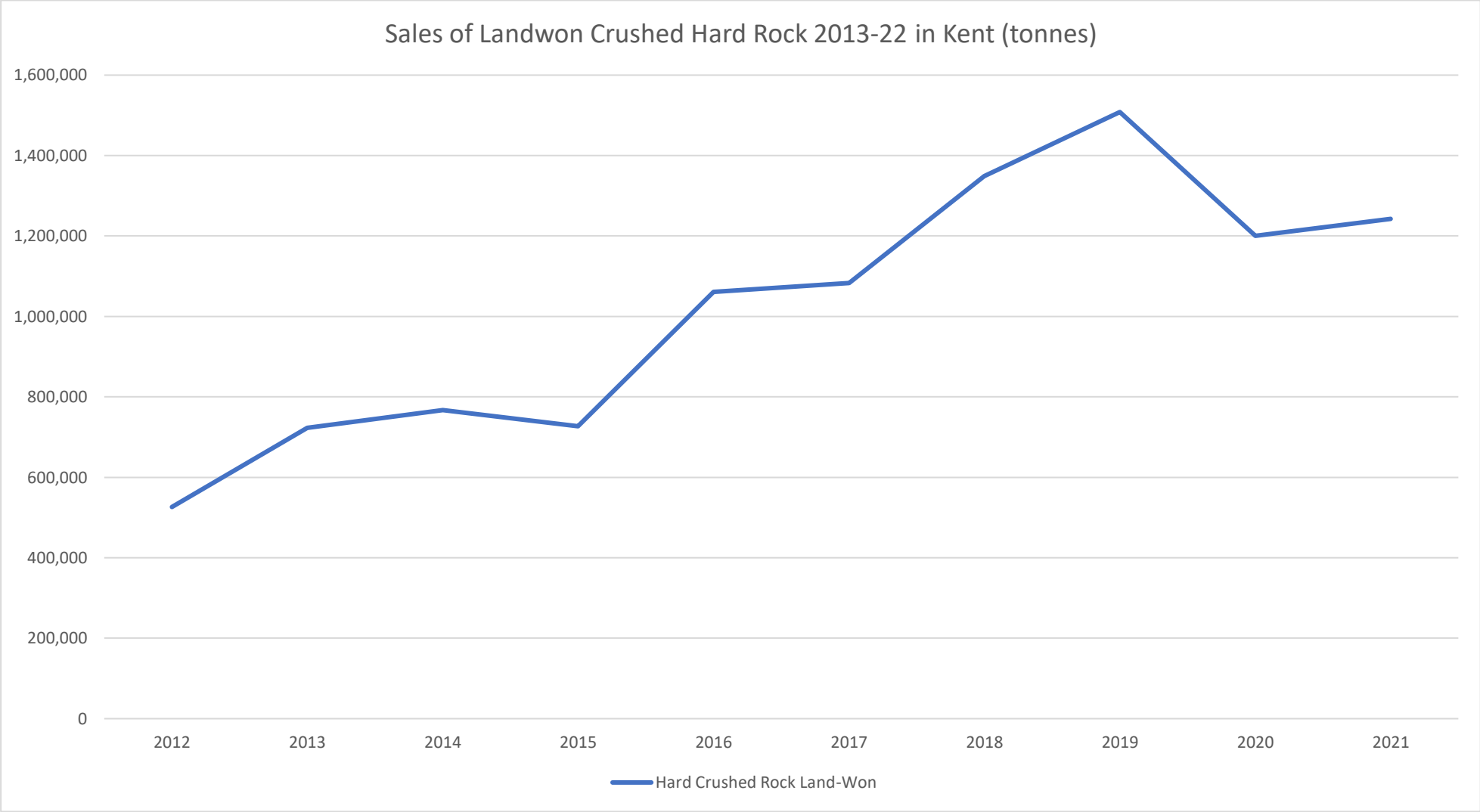
4.11 Table 4 and Figure 4 below shows the monitoring data for landwon crushed rock sales graphically. The pattern is one of significantly increasing demand since 2017; peaking in 2020 at an unusually high level of 1.5mtpa, with sales falling back in 2022 to the levels more recently recorded in the 1+mtpa range.

Table 4: Landwon Hard Rock Sales in Kent, 2013-2022 (Million tonnes)

Year	Tonnes	Reserves as of end of 2022 (tonnes)
2013	526,281	
2014	722,985	
2015	767,198	
2016	727,272	
2017	1,061,529	
2018	1,083,122	**14,854,411**
2019	1,349,319	
2020	1,508,239	
2021	1,200,433	
2022	1,242,839	
Last 3-year average (2020-22)	**1,317,170**	
Last 6-year average (2017-22)	**1,240,914**	
Last 10-year average (2013-22)	**1,018,922**	

Source: Aggregate Monitoring Surveys, 2013-2022

Figure 4: Kent Sales of Landwon Crushed Rock 2013-2022 (tonnes)



4.12 The reserves for the end of 2022 are estimated as 14.85mt following the operator using three-dimensional modelling in 2021. The LAA Rate/APR is 1.24mtpa using the 6-year sales average, due to the significant sales (over 1.0mtpa) between 2017-22.

4.13 The AM2023 data (reporting 2022 sales) shows that the LAA Rate/APR (taken as the last 6-year sales average) is significantly greater than the 10-year LAA Rate/APR previously used. This is because there was an under reporting of the entirety of the hard rock sales, and that since 2017 the landwon sales significantly changed to being 1+mtpa (see Table 5 below), therefore it is clear that the available reserves are being reduced at a far greater rate than previously considered. The recent three-dimensional modeling of the reserves undertaken by the applicant, estimates that now 14.85m[6] remain. The remaining reserves are insufficient for the remaining adopted Plan period (to 2030 with a 10-year landbank remaining at the end of 2030). Therefore, the extended anticipated Plan period to 2039 would result in an even greater shortfall. The implications of this are discussed later in this document (see section 7.0 Future Aggregate Supply). Table 5 and Figure 5 overleaf demonstrate how landwon supply while dominant, is also significantly supplemented by both rail and wharf importation.

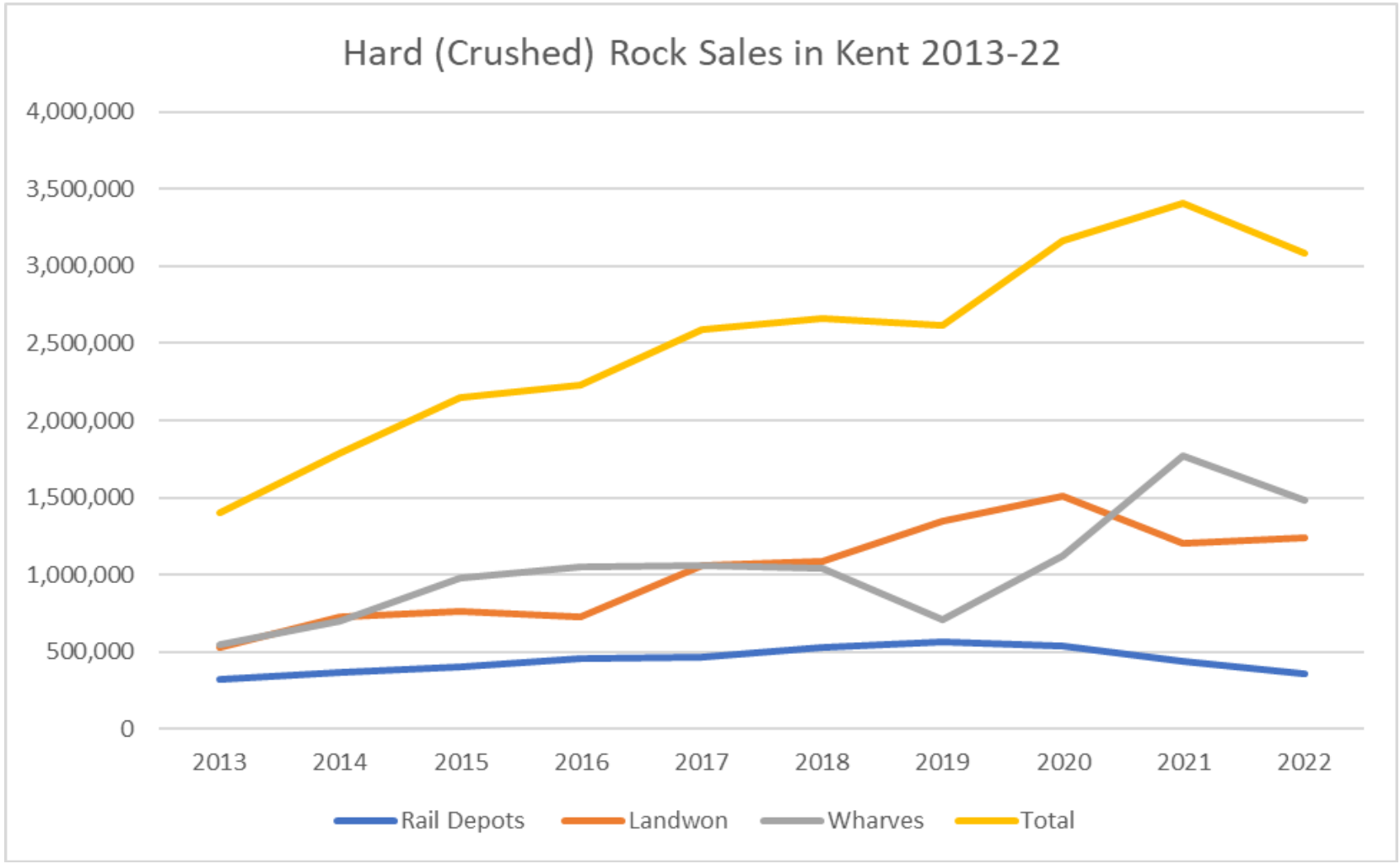
Table 5: Hard Rock Sales in Kent 2013-2022 (tonnes)

	Wharves	Rail Depots	Landwon	Total
2013	546,541	326,578	526,281	1,399,400
2014	697,421	375,938	722,985	1,792,023
2015	975,875	405,331	767,198	2,148,404
2016	1,052,971	452,751	727,272	2,232,994
2017	1,057,785	468,785	1,061,529	2,588,099
2018	1,043,721	533,110	1,083,122	2,659,953
2019	708,751	561,738	1,349,319	2,619,808
2020	1,119,202	538,458	1,508,239	3,165,899
2021	1,770,068	441,084	1,200,433	3,411,585
2022	1,479,058	362,614	1,242,839	3,084,511
Total	**10,451,393**	**4,462,066**	**10,189,217**	**25,102,676**
3-year average	**1,456,109**	**447,385**	**1,317,170**	**3,220,665**
6-year average	**N/A**	**N/A**	**1,240,914**	**N/A**
10-year average	**1,045,139**	**446,207**	**1,018,922**	**2,510,268**

Source: Aggregate Monitoring Surveys, 2013-2022

[6] 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, 2013-2022 (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])[7] 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 acknowledges.

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 AM2023 (2022 sales data).

Table 6: Kent Landwon Aggregate Reserves and Aggregate Landbank as of 2022

Landwon Aggregate Primary Minerals	Permitted Reserve (mt) at end of 2022	Landbank based upon 10yr average sales (LAA Rate) between 2013-2022 (years)) and 6yr average sales for Hard Crushed Rock 2017-2022	Landbank based upon 3yr average sales between 2020-2022 (years	Landbank based upon 2022 sales alone (years)
Soft Sand	**5.574**	5.574/0.475=**11.73**	5.574/0.520 = **10.72 years**	5.574/0.575 = **9.69 years**

7 https://www2.bgs.ac.uk/mineralsuk/download/england/kent.pdf

Sharp Sand & Gravel	**2.230**	2.230/0.176 = **12.67 years**	2.230/0.153 = **14.57 years**	2.230/0.124 = **17.98 years**
Hard Rock	**14.85**	14.85/1.240 = **11.97 years**	14.85/1.317 = **11.27 years**	14.85/1.242 = **11.95 years**

Chalk

4.16 There were no sales of chalk as a graded aggregate in Kent in 2022.

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 (though this changes through time) active 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 2022) in producing recycled aggregates from the construction, demolition and excavation waste stream and secondary aggregates from industrial by-products. As was the case for AM2022, a significant number of producers of recycled/secondary aggregate did not participate in the survey, with only 13 providing returns to AM2023. As a result, the reported sales data is likely to be significantly lower than actual sales that occurred. 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 with a reported productive capacity of 0.484 mtpa (AM2023 data) is in all probability significantly under reported. In 2020, this was given as 3.41mtpa for the recycled aggregates and 50Ktpa for the secondary aggregates, a total of 3.46mtpa. The value of at least 4.0mtpa based on waste needs assessments 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 and Wharf Sites in Kent

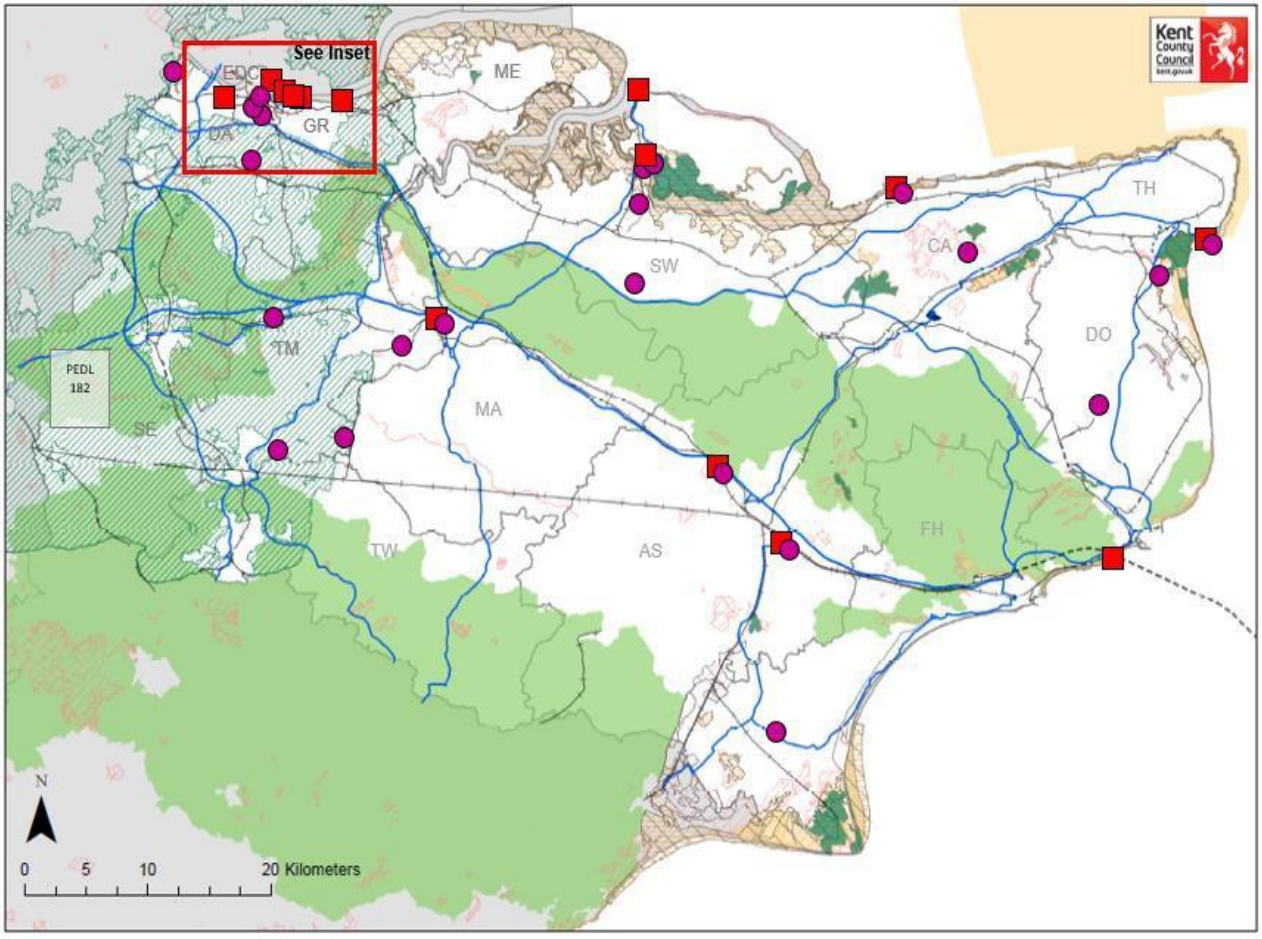
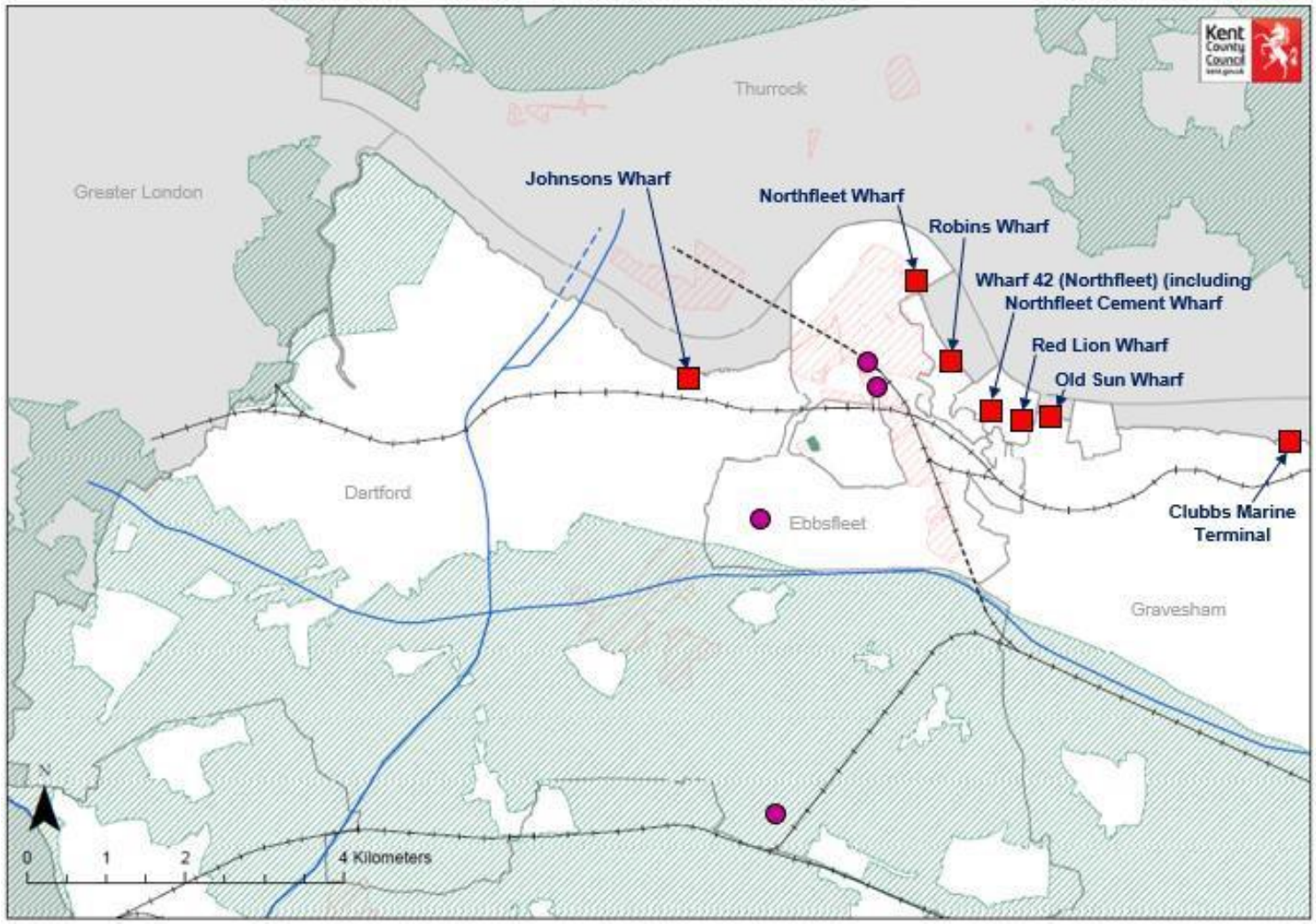


Figure 6a: Location Map of Active Recycled and Secondary Aggregate and Wharf Sites in Northwest Kent



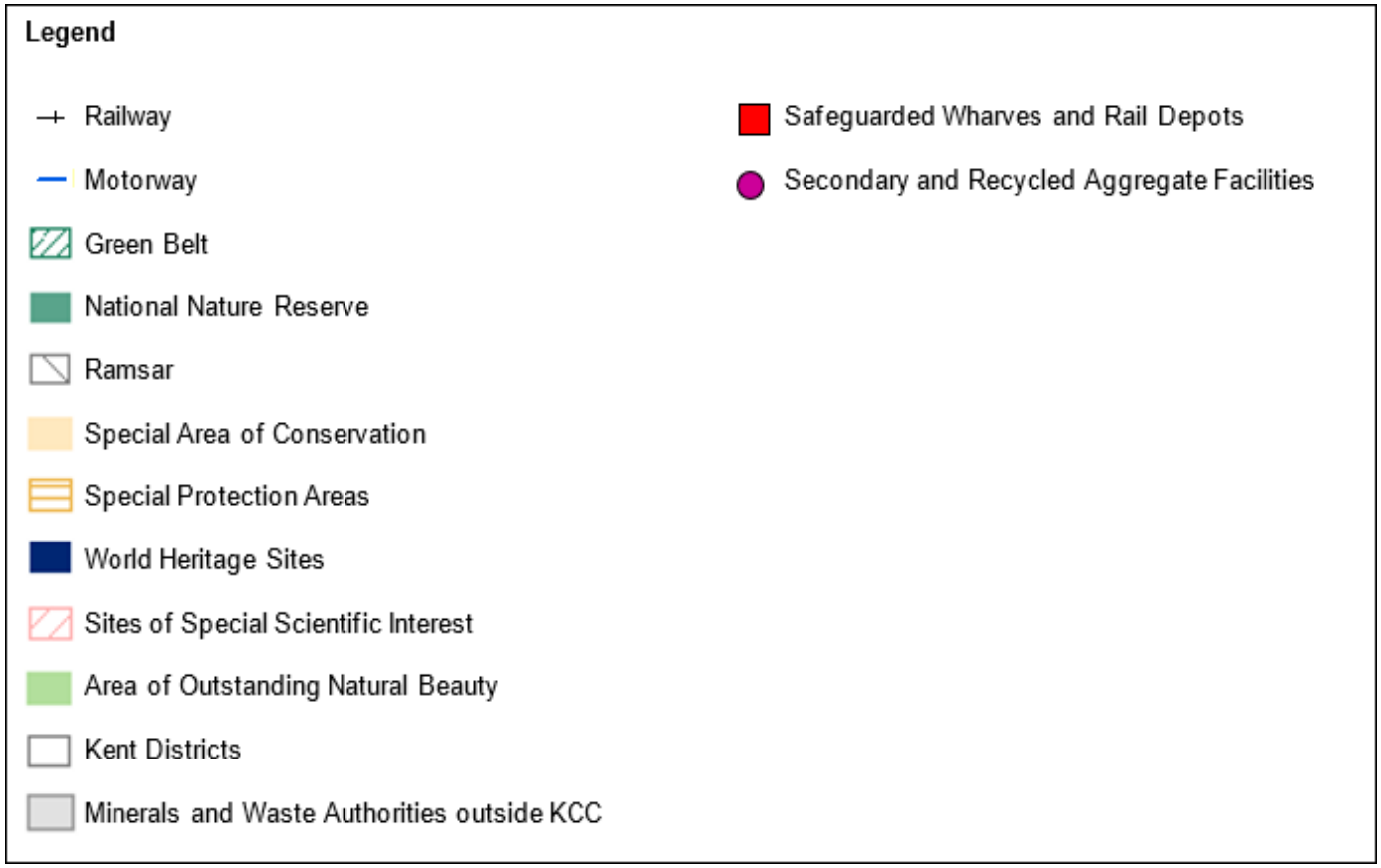

Legend
Railway
Motorway
Green Belt
National Nature Reserve
Ramsar
Special Area of Conservation
Special Protection Areas
World Heritage Sites
Sites of Special Scientific Interest
Area of Outstanding Natural Beauty
Kent Districts
Minerals and Waste Authorities outside KCC
Safeguarded Wharves and Rail Depots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

Table 7: Recycled and Secondary Aggregate Sales in Kent, 2013-2022 (Million tonnes)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	3-year average	10-year average
0.693	0.620	0.891	1.135	0.956	0.804	0.956	0.997	1.04	0.843	**0.961**	**0.894**

Source: Aggregate Monitoring Surveys, 2013-2022

4.19 Sales of secondary/recycled aggregates combined account for 12.88% (0.842mt) of the total sales from local production and importation in the County of all types of aggregate. This is slight decrease to that recorded in AM2022 (2021 data) where the recycled and secondary aggregate share of the overall aggregate supply market was 13.47%, though data from this sector is not considered to be 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. Therefore, fluctuation around the 0.80-1.0+mtpa appears to be the 'normal' level of output.

5.0 Aggregate Importation

Marine and Landwon Sand and Gravel Importation

5.1 Kent has 9 active/semi-active wharves out of a total of 12 safeguarded wharves[7] located on its coast as shown in Figure 6 and 6a. These supply the bulk of sand and gravel (marine dredged) imports with rail depots delivering considerably less (see Fig 8). Dunkirk Jetty at Dover Western Docks had been decommissioned (as reported first in AM2016) and but has become active again in 2021 and remains so in 2022. 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).

[7] 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, 2013-2022 (Million tonnes)

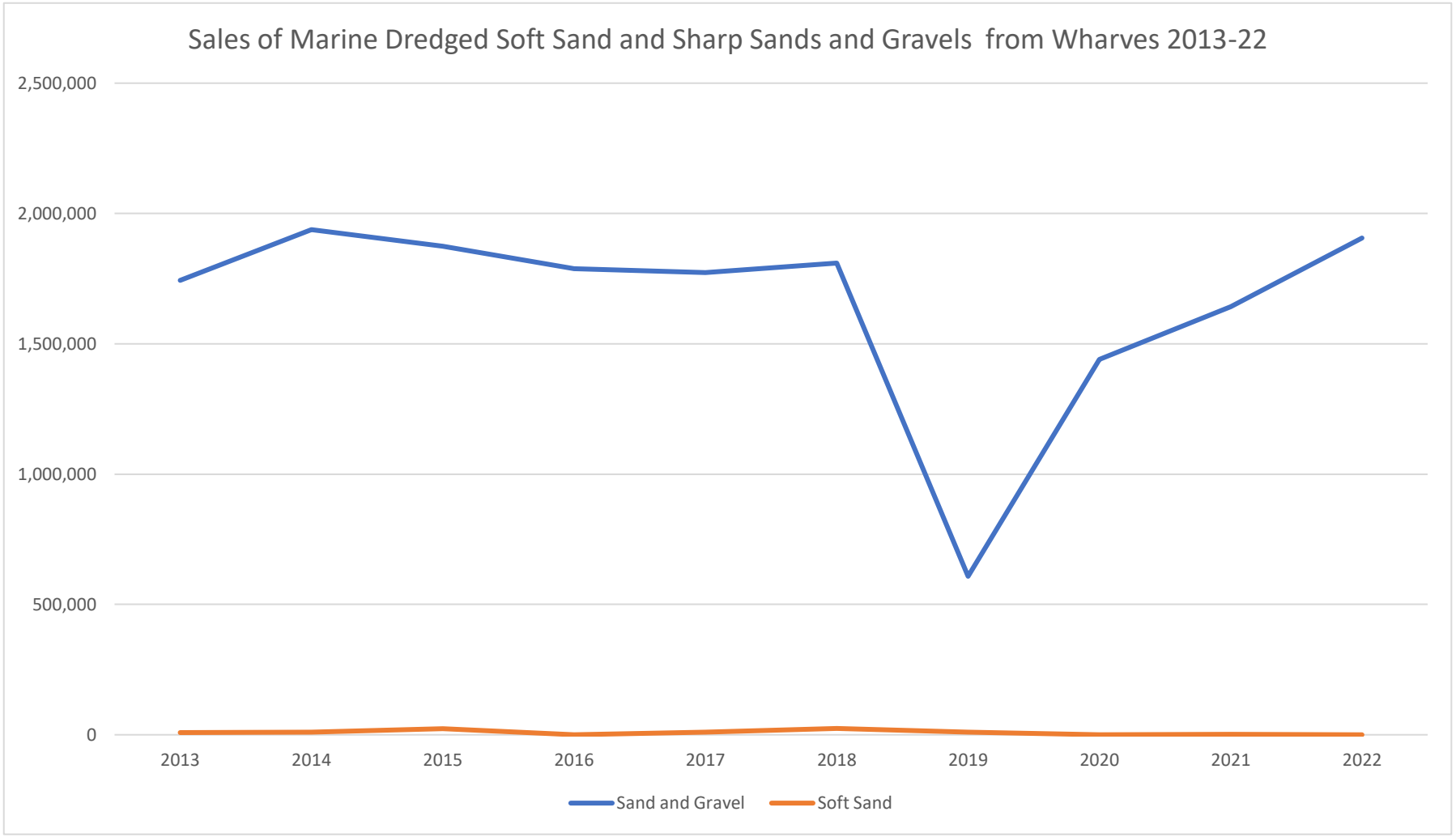
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	3-year average	10-year average
Sales	1.743	1.938	1.874	1.788	1.773	1.809	0.608	1.440	1.644	1.906	**1.662**	**1.685**

Source: Aggregate monitoring surveys, 2013-2022

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. In 2022 this has increased again to 8.21mtpa. It was understood that Kent's wharves had a theoretical capacity of some 7.30mtpa, given a joint Kent and Medway importation study in 2010. However, maximum importation capacity is unlikely to be the practical operational capacity as wharves would not, in all likelihood, be able to operate at their respective 100% capacity at all times. Plant and wharf/jetty maintenance and other operational factors (such as available shipping movements and meteorological conditions) would combine to render operationally sustainable capacity to below the theoretical maximum capacity.

5.3 Sand and gravel (marine) imports via the wharves showed a marked decline in 2019, then a recovery to 1.44mtpa in 2020 and 1.642mtpa in 202. In 2022 this trend continued with a recorded 1.906mt. It is considered that the uncertainty surrounding the UK's exit from the European Union was responsible for this observed rapid decline and then recovery. The increases year on year since 2019 may also reflect that in Kent, landwon sharp (concreting) sand and gravel is depleting leading to greater volumes of marine dredged materials coming onto the market via wharves. The bulk of the sand and gravel imports are marine dredged in origin; landwon sand and gravel is also imported via wharves, but in relatively limited quantities. Given that landwon supply of an essentially similar resource is rapidly depleting in Kent, it can be assumed that substitution by wharf importation will continue to be the main source of supply of this type of aggregate into the future. Note that there is also a very minor quantity of marine soft sand importation that occurs in Kent (see Fig 7 overleaf).

Figure 7: Marine Dredged Sharp Sand and Gravel and Soft Sand 2013-22



5.4 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 is 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.*

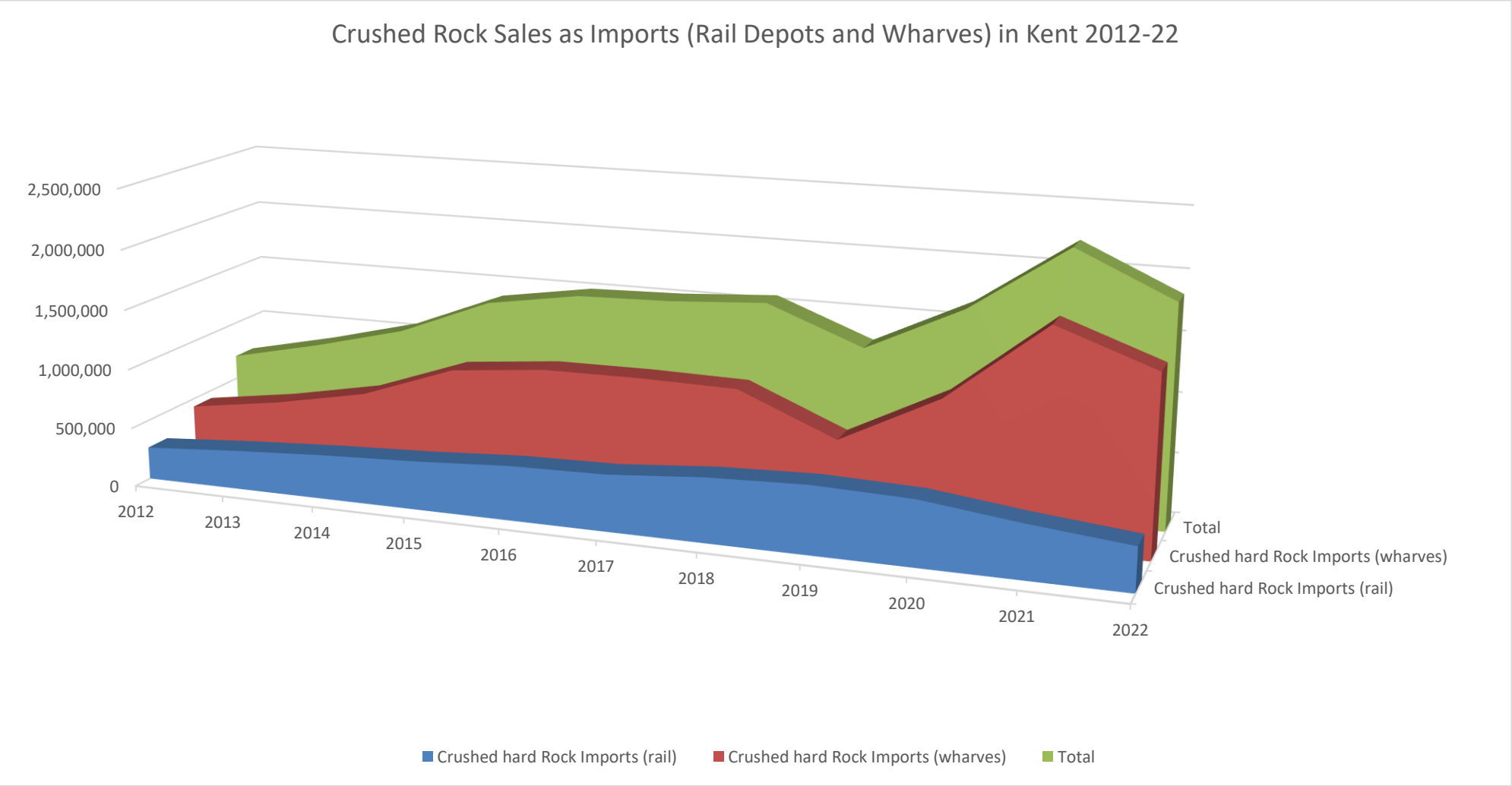
- *The current rate of extraction by all companies to all marine aggregate wharves in the UK and on the European mainland is some 45% of the quantities permitted per annum thus reinforcing the sustainability and long-term viability and requirement of marine aggregate wharves in Kent.*

5.5 The area of the overall resource that supplies Kent, was estimated as 99mt in 2011, and is estimated to be in the order of 85mt as of 2022 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

5.6 Landwon sales of crushed rock overtook importation via wharves in 2017, and wharf importation then eclipsed landwon sales in both 2021 and 2022 (with recorded sales of 1.77mt and 1.48mt consecutively) despite landwon sales also increasing.. The overall increase in landwon sales and importation via wharves 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. Figure 8 (overleaf) shows the dominance of wharf importation (as sales) compared to rail depot sales. Future monitoring will demonstrate if wharf importation continues to outstrip landwon supply.

5.7 **Figure 8: Crushed Rock Sales (importation) from Rail Depots and Wharves in Kent, 2012-2021 (Million tonnes)**



Landwon Aggregate Importation

5.8 Table 9 clearly demonstrates that the vast majority of imported landwon aggregate is supplied via wharves with crushed hard rock dominating the imported supply. Rail depots, with an exception for again hard crushed rock, demonstrated far less overall importance in terms of quantities of aggregate supplied. As landwon sources in Kent become depleted, it is highly likely that in the future more aggregate will be supplied via this route, 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 in relatively small amounts (see Figure 10 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 2013.

Table 9: Landwon Aggregate Importation (Sales) to Rail Depots and Wharves in Kent, 2013-2022 (Million tonnes)

Year	Soft Sands (Rail)	Sharp Sands and Gravel (Rail)	Sharp Sands and Gravel (Wharf)	Crushed Hard Rock (Rail)	Crushed Hard Rock (Wharf)	Totals
2013	6,128	35,702	127,000	326,578	546,541	1,041,949
2014	4,591	92,095	0	371,617	697,421	1165724
2015	5,567	29,064	175,235	405,331	975,875	1,591,072
2016	5,370	29,118	231,200	452,751	1,052,971	1,771,410
2017	8,212	24,214	244,234	468,785	1,057,785	1,803,230
2018	6,477	28,194	235,122	533,110	1,043,721	1,846,624
2019	10,222	24,917	0	561,738	708,751	1,305,628
2020	10,222	24,917	18,572	538,458	1,119,202	1,711,371
2021	2,890	21,747	274,264	441,084	1,770,068	2,510,053
2022	7,162	725	127,000	362,614	1,479,058	1,041,949
Last 3-year average	**6,758**	**15,796**	**97,612**	**447,385**	**1,456,109**	**1,842,351**
Last 10-year average	**6,684**	**31,069**	**145,070**	**446,207**	**1,045,139**	**1,638,562**

Source: Aggregate Monitoring Surveys, 2013-2022

5.9 Figure 9 below shows the sales of imported landwon primary aggregate between 2013-2022 graphically.

Figure 9: Landwon Aggregate Sales from Rail Depots and Wharves in Kent, 2012-2021 (Million tonnes)

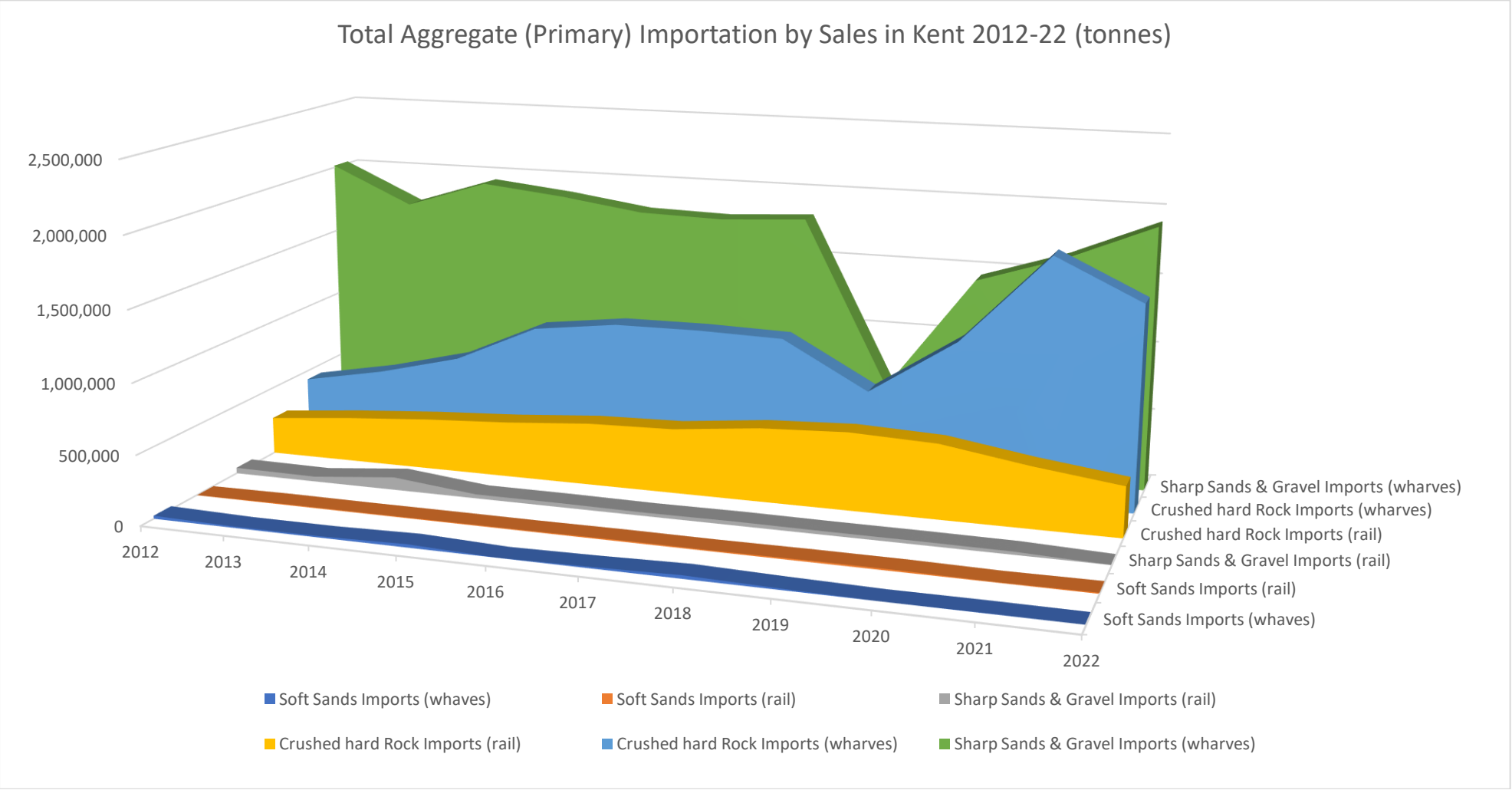
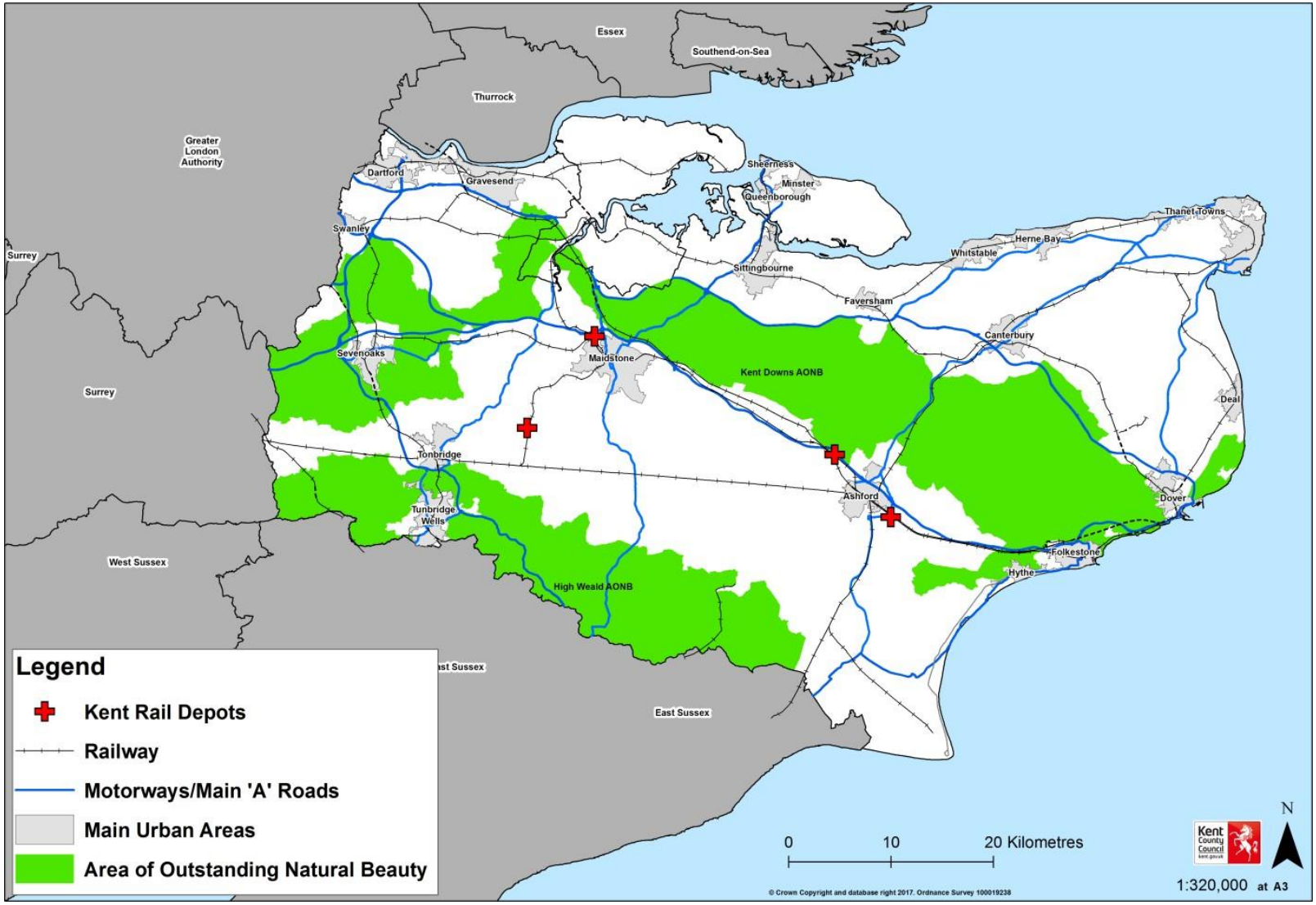


Figure 10: Location Map of Active Rail Depots in Kent



6.0 Total Aggregate Production in Kent in 2013-2022

6.1 During 2022 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 is not included.

Table 10: Total Aggregate Production (Sales) in Kent during 2013-2022 (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
2013	0.48	0.0152	0.27	1.77	0.526	0.87	0.69	4.6212
2014	0.29	0.0098	0.17	1.97	0.723	1.07	0.62	4.8528
2015	0.48	0.0288	0.24	2.06	0.767	1.38	0.90	5.8558
2016	0.51	0.0079	0.26	2.05	0.727	1.50	1.14	6.1949
2017	0.52	0.0098	0.15	2.19	1.061	1.53	0.96	6.4208
2018	0.49	0.0326	0.12	2.07	1.083	1.58	0.80	6.1756
2019	0.42	0.0100	0.08	0.633	1.349	1.27	0.96	4.7220
2020	0.39	0.0100	0.13	1.442	1.508	1.66	0.99	6.1300
2021	0.59	0.0050	0.20	1.663	1.200	2.21	1.04	6.9080
2022	0.57	0.0093	0.12	1.906	1.242	1.84	0.84	**6.5273**
Total 2013-22	**4.75**	**0.1384**	**1.24**	**17.75**	**10.19**	**14.9**	**8.94**	**58.408**
Last 3-year average	**0.52**	**0.0081**	**0.15**	**1.68**	**1.317**	**1.90**	**0.96**	**10-year average 5.84**
Last 10-year average	**0.475**	**0.01384**	**0.176**	**1.72**	**1.018**	**1.49**	**0.894**	**3-year average 6.52**

Source: Aggregate Monitoring Surveys, 2013-2022. $ 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 records sales and not end use. It is a reasonable assumption that a degree of exportation out of Kent occurred to other areas, as demonstrated by import and export studies in past aggregate monitoring in 2009, 2014 and 2019. Moreover, importation by road is not picked up by the AM surveys conducted by Mineral Planning Authority's during normal Annual Monitoring periods. The more comprehensive surveys of imports and exports undertaken by BGS, that can reveal aggregate consumption were, as stated above, 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 wharves and are particularly dominant with regard to imported crushed rock[8].

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 sand 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 2022 increased (1.904mt) compared to 2021 (1.663mt), possibly demonstrating that imports (mainly marine dredged aggregates) are displacing the landwon supply overall that is significantly decreasing. Imports of crushed rock in in 2022 fell to 1.84mt compared to that of 2021 (2.21mt). Both were greater again than the 10-year average (1.49mt). The main observation is that, apart from the sharp sands and gravels, all sales of imported primary aggregates imported into Kent are increasing, though in the case of soft sand imports this is a marginal increase, and essentially irrelevant in overall supply terms. Landwon soft sand supply from Kent has increased slightly, permitted reserves have contracted to a degree. Overall landwon sand and gravel is in depletion and landwon crushed rock sales have since 2017 exceeded the 1.0+mtpa level. It appears that this may be the normal level of landwon production (as expressed by sales data).

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

6.5 Sales of recycled/secondary aggregates sales showed a significant increase to 0.91mtpa in 2020, well above the 10-year average of 0.688mtpa at the time and in 2021 this figure increased again to 1.04mtpa. In 2022 it has fallen back to 0.84mtpa, the 10-year sales average now being 0.894mtpa. It would appear that approaching 1mtpa is the ‘steady state’ for recycled and secondary aggregate in Kent. Figure 11 overleaf shows total aggregate (all types) sales and Figures 12 and 12a illustrates the separate primary aggregate type sales in Kent from 2013 to 2022 graphically.

Figure 11: Total Aggregate Production (Sales) in Kent during 2013-2022 (tonnes)

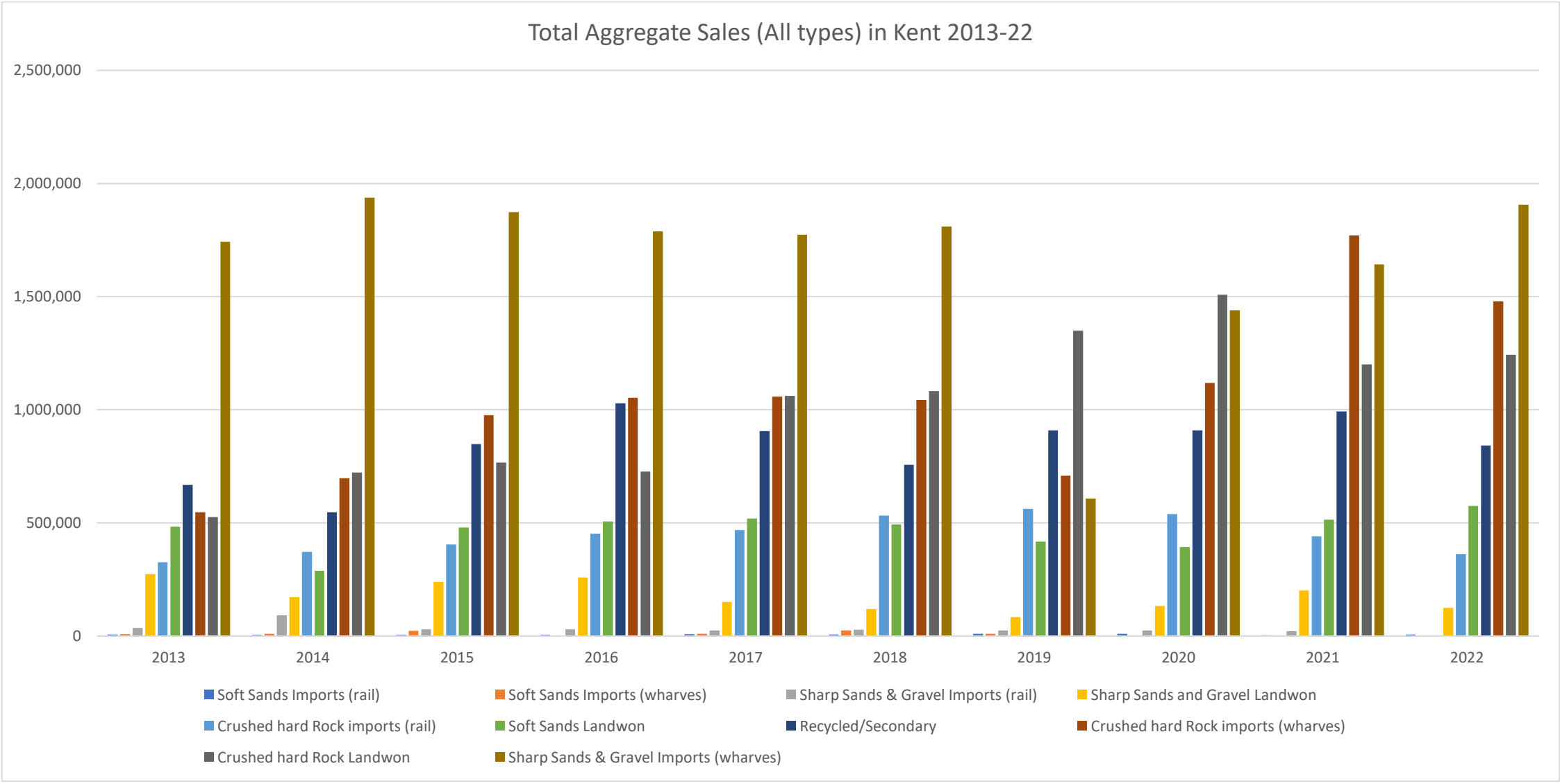


Figure 12: Total Primary Aggregate Production (Sales) in Kent during 2013-2022 (tonnes)

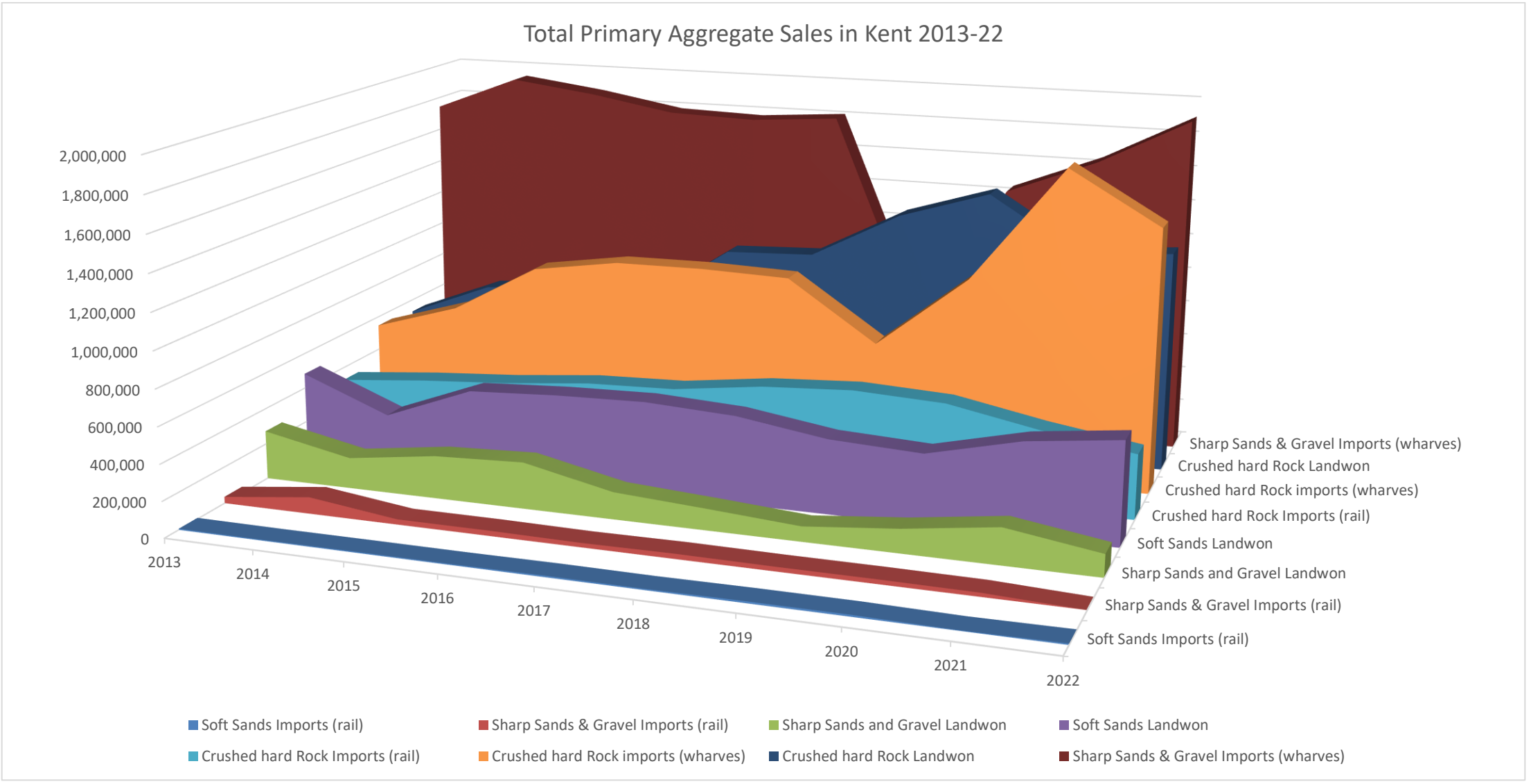
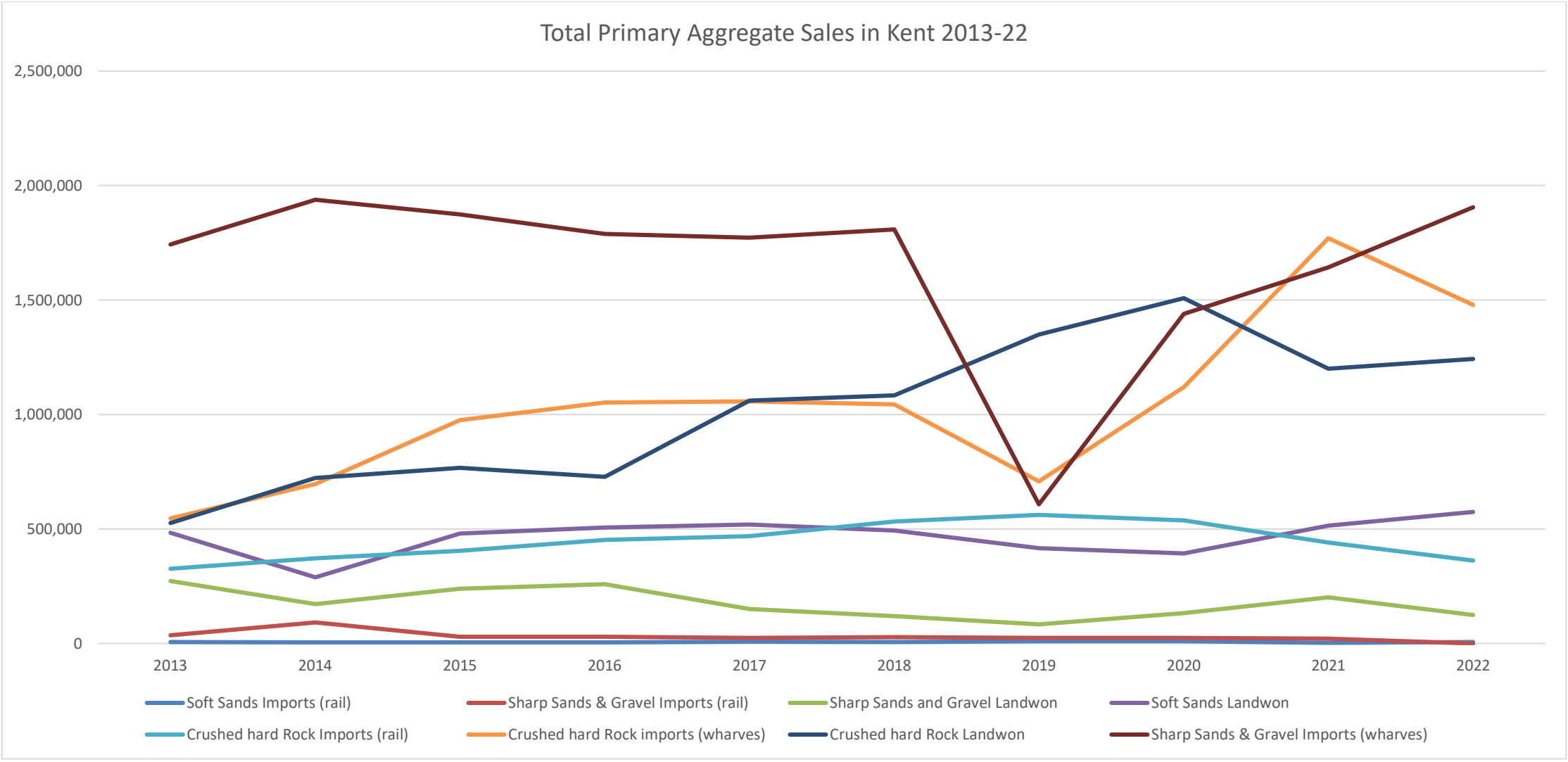


Figure 12a: Total Primary Aggregate Production (Sales) in Kent during 2012-2021 (tonnes)



6.6 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 reversal observed in the 2020 and 2021 sales data is also being shown in the 2022 sales data. Landwon soft sand sales also experienced contraction, but of a lower degree of magnitude, and are now showing some recovery that continued into 2022. The landwon sales of crushed rock, for the reasons given above, were the beneficiary of very local circumstances in Kent. The data now revised to include construction fill sales, shows landwon crushed rock remaining at 1.0+mtpa levels which may represent how this aggregate type may continue to be represented in the overall pattern of supply. Importation of sharp sands and gravel from marine sources continue to be the dominant form of supply for this aggregate type and has reached almost 2.0mt in 2022. As landwon sources deplete this trend is considered set to continue.

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. A direct relationship between sales and construction in one Mineral Planning Authority (MPA) area is however unlikely to be probable, given that imports and exports into and out of any given MPA also occur. An examination of the main construction predictions can potentially *indicate* whether aggregate needs are likely to grow or decline, over any given plan period. The 2021 housing targets and infrastructure projects (as generally 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 (Kent and Medway combined) to be required between 2019 and 2039, 11,250 per annum. An increase of 3.5% over the 2019 estimation. An update to the Housing Led Forecast 2021 (by Kent Analytics, Kent County Council) predicts the between 2020-40 **222,757** (Kent and Medway combined) and **190,398 homes** in Kent will be required. Iin 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>2020-24

Primary 12.8FE

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

Primary 26.6 FE

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

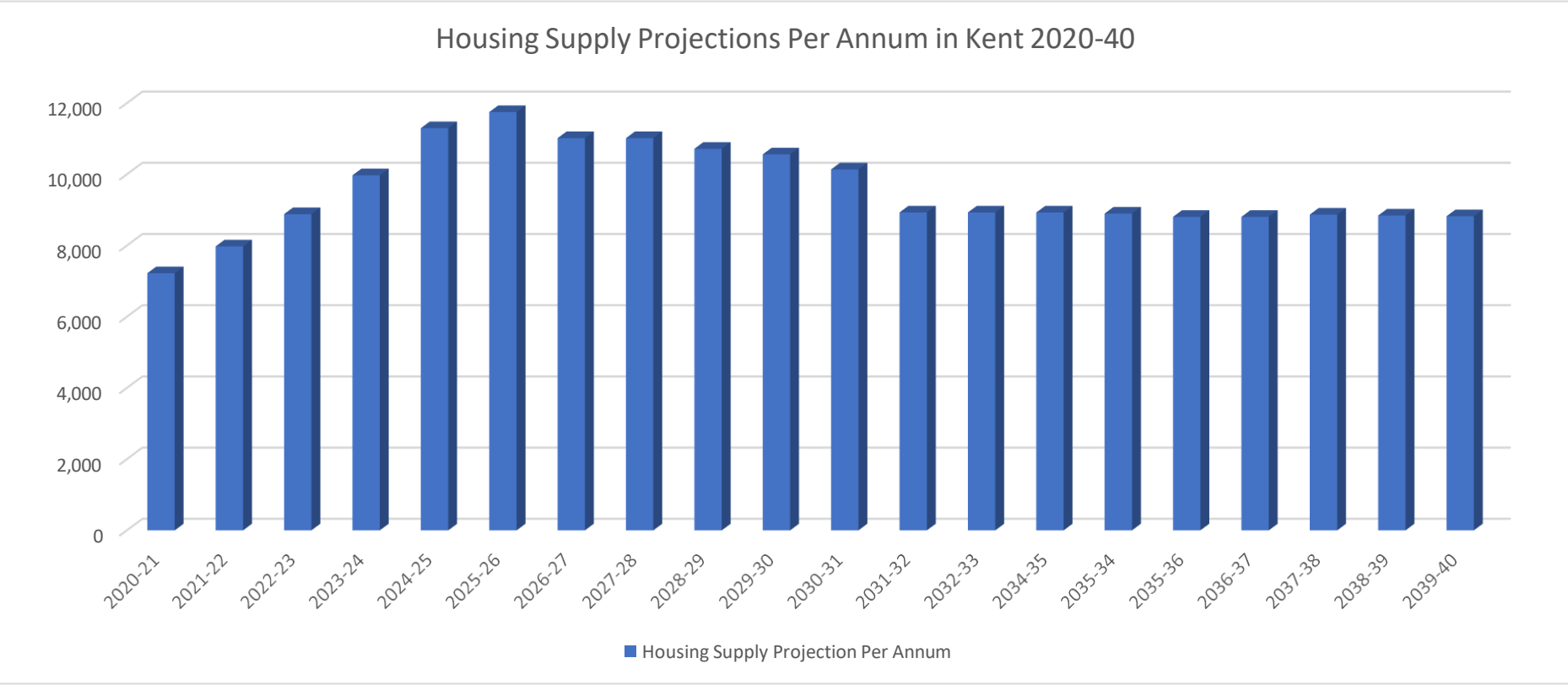
Primary 11 FE

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

No data</td></tr>
<tr><td>Infrastructure</td><td colspan="4">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 in Kent to 2040 has not been updated since reported in LAA2022 at 190,398 for Kent. Figure 12 below shows the 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 13: New Housing Growth Per Annum Requirement Predictions in Kent 2020-40



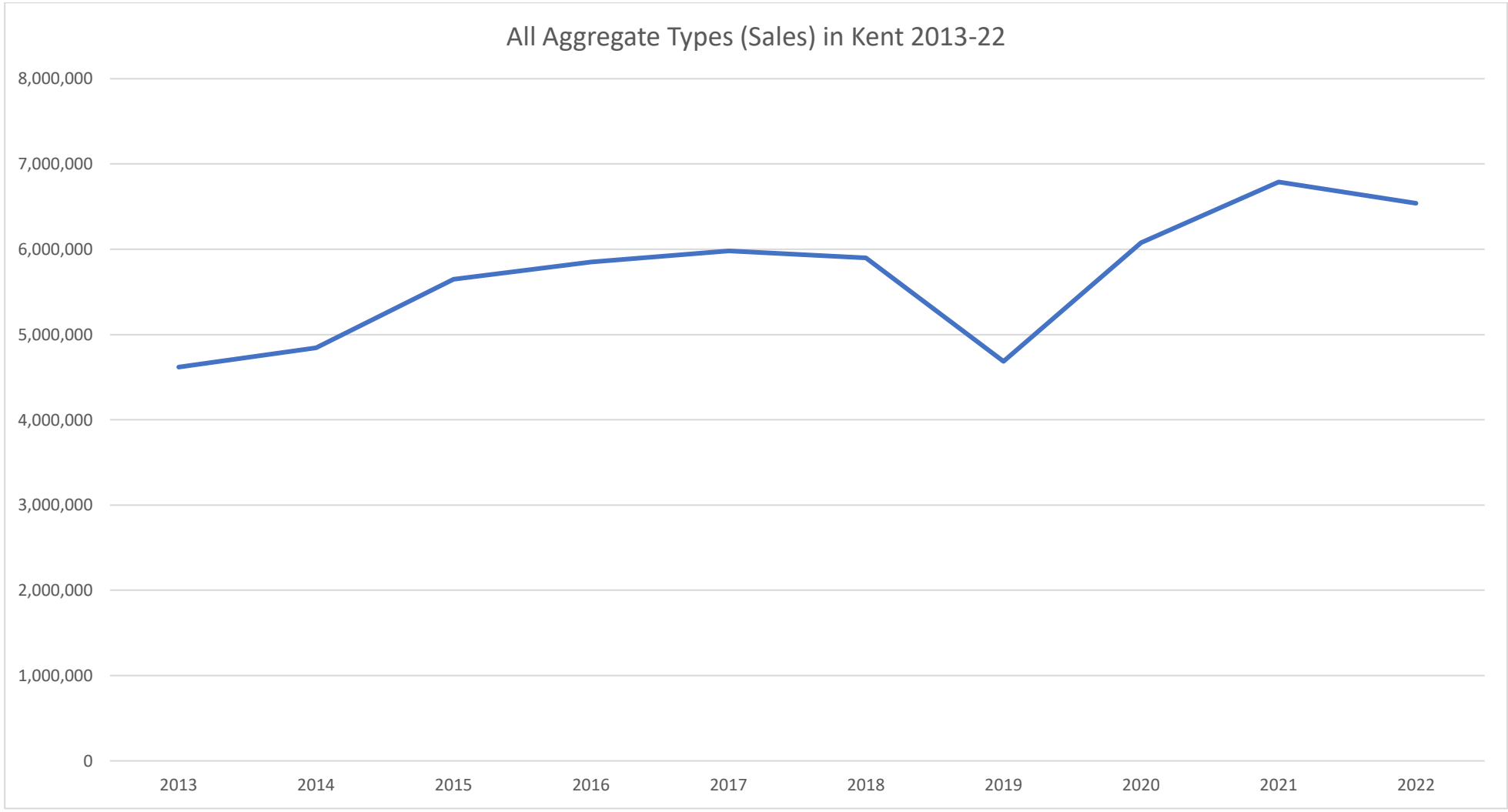
7.3 In addition to the above Kent based housing needs, the Ebbsfleet Garden City (a planned development) will add a further 15,000 homes to the overall total that will require an increase in overall aggregate supply. However, the overall magnitude of housing growth compared to previous monitoring periods is now one of predicted decline, particularly between 2026-2031 and then a 'stagnant' period of essentially no growth to 2040, leading to an overall reduction compared to past predictions. 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. Other areas (including Medway and East Sussex) may also have the effect of drawing on Kent's aggregate reserves, however their past influence in this regard is reflected in the collation of the AM sales data. Given that

aggregates are a relatively low cost and heavy raw material commodity and that the transport costs are a significant factor in their profitability, it is not considered that other area development pressure should have significant 'weight' in influencing Kent's future mineral needs. The Council's mineral strategy recognises that Kent supplies materials to other areas.

7.4 The demand projections in infrastructural development, as reported in LAA2022 have not significantly altered. They include port expansion, East Kent rail connections and major highway schemes (A2 and motorway junction improvements) additional to the Lower Thames Crossing proposal which is the subject of a current Development Consent Order application. 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. The gradient in the sales data from 2021 to 2022 has slightly declined (as shown in Figure 14 overleaf) unlike the increase in sales rate of growth between 2019 to 2021. Therefore, the characteristic of a marked steep recovery from the recorded exceptionally low level of sales during 2019 showed a levelling off in 2021, and a slight decline in 2022. This could be indicative of a reduction in overall construction demand based on wider UK economic factors such as high interest rates and low growth in the gross domestic product (GDP) of the UK at the present time.

7.5 While it is concluded that there are no local construction indicators, such as housing (as described above) that indicate a likelihood of significant increases in the demand for construction aggregates above the historic 5-6mtpa levels observed in Kent. However, this conclusion is not immune from a consideration of the wider regional growth estimates that may be made in the future. For example, although housing supply is estimated to have some growth, then fall and level off in 2031, and is overall below the levels of the 2020 projections, this indicator may change. It is also possible that other major infrastructure schemes could be determined over the anticipated Plan period to 2039. This eventuality could have an effect on overall aggregate demand that cannot be estimated at this time and would be considered in future LAA.

Figure 14: Total Aggregate (Primary and Recycled/Secondary) Sales in Kent 2013-2022



7.6 Figure 14 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 2021 back to 6.0+mtpa 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.

7.7 Continued monitoring will demonstrate if sales of all aggregate types fall 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 ‘the Brexit effect’ in 2019 and the Covid 19 pandemic effects are possibly still working their way through the economy. The County Council regards the future demand prediction using the 10-years sales averages for soft sand and sharp sands and gravel and 6-years sales averages for hard rock as the most reliable metric for considering demand over the remaining adopted plan period and for the emerging plan period. This approach will continue to average out the inevitable fluctuations in overall supply that have occurred and will continue to occur. However, it is to be recognised that general growth, over the long term can be reasonably anticipated in the South East, this will include Kent. Continued monitoring will demonstrate if expansion or contraction in aggregate demand occurs in Kent in response to this.

Available Permitted Reserves and Landbanks

7.8 The 2022 data (AM2023) collected for Kent shows the reserves for the following aggregate mineral types *as of the end* of 2022:

- Soft sand markedly reduced from 6,224,773 tonnes to 5,573,784 tonnes, there has been no replenishment of reserves.
- Sharp sands and gravel reduced from 2,564,000 tonnes to 2,230,000 tonnes, there has been no replenishment of reserves.
- Hard rock, confidentiality has been waived in LAA2021 by the operator and show that the overall estimation of permitted reserves was 14,854,411 tonnes.

7.9 These reserves are the estimates of all the respective aggregate mineral sites operating in Kent for the end of 2022 for soft sand, sharp and gravel and hard rock, although there is a fairly high degree of confidence for the latter having been recently modelled. It is recognised that the data in 2022 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 2023 is collected by AM2024. 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 provided by the industry and the last 10-year (soft sand and sharp sand and gravel) and 6-year (hard crushed rock) sales averages.

Soft Sands

7.10 With regard to the soft sands landbank, the 2013-2022 ten-year sales average is 475,038 tonnes per annum, up slightly (4.09%) from 456,345 tonnes per annum in 2021. The three-year sales trend has increased from 467,992 tonnes per annum to 520,5452 tonnes per annum in 2022. The 10-year average (Kent's LAA/APR Rate) gives a landbank of 11.73 years based on a reserve of 5.574 million tonnes at the end of 2022, above the 7-year minimum required by the NPPF. The recorded sales since 2013 are shown on Table 12 below.

7.11 Soft sand sales in 2022 were 574,685 down from the 594,099 tonnes recorded in 2021. Though 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 0.5+mtpa mark, as historically 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 relatively recent impacts. Current economic predictions are for the UK to experience low growth (possibly negative) of gross domestic product (GDP) into 2024. 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 (any successor plan period) and beyond to 2040. Further monitoring will determine if higher levels of demand returns, and sales regain the consistency seen in 2015-2018. Table 12 below details the soft sand sales 2013-2022.

Table 12: Landwon Aggregates Sales - Soft Sands 2013-22

Year	Sales (Tonnes)
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
2022	574,685

Sales Averages
10-year Sales Average (2012-21) 0.475mtpa
3-year Sales Average (2012-21) 0.520mtpa

Source: Aggregate Monitoring Surveys, 2013-2022

Sharp Sands and Gravel

7.12 The marked decline in overall reserves from 3.18mt in 2019, to 2.78mt tonnes in 2020 to just 1.38mt in 2021 demonstrated the apparent decreasing importance of this form of supply. However, the 2021 reserves estimate appears to have been an underestimation, reserves as of the end of 2022 were reported as 2.230mt. However, in 2022 there was again no replenishment in the form of additional planning permissions. Correspondingly available reserves are set to continue to decline.

7.13 Recorded sales in 2022 were 124,200 a significant decrease from the 202,022 tonnes recorded in 2021. The ten-year sales average decreased again decreased from 228,526 to just 175,717 tonnes in 2022. The landwon sharp sand and gravel landbank based on the last 10-year sales (the Kent LAA/APR Rate) average is currently 12.67 years, greater than the ‘at least 7-years’ as required by the NPPF. However, given that this is a depleting resource, the extending landbank life is a reflection of declining sales, rather than one that is sufficiently greater than the ‘at least’ 7-year landbank level. The reality is that supply of this type of aggregate is increasingly being met by imports. Table 13 below shows recorded tonnages of sales of landwon sharp sand and gravel since 2013-22.

Table 13: Landwon Aggregates Sales Sharp Sands and Gravels 2013-22

Year	Sales (Tonnes)
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
2022	124,200
Sales Average last 10-years (2012-21)	**175,717**
Sales Average last 3-years (2019-21)	**152,818**

Source: Aggregate Monitoring Surveys, 2013-2022

Crushed Rock

7.14 Previously, 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 third time in an LAA report. The sales of crushed rock were not fully reported in the past due to the exclusion of construction fill, it is now considered that the volumes of this material form part of the overall hard crushed rock supply. The sales increase in 2017, of over 1.0mt was significantly more per annum than the previous 2013-2016 period and is a notable step change in the sales of this primary landwon aggregate type. The change to ‘high’ sales may well be due to very local circumstances that exist 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 is considered part of the explanation for these sales increases. The consistently ‘high’ sales of over 1.0+mtpa since 2017 gives rise to the recognition that, the use of a 6-year sales average is more appropriate than the 10-year sales average when predicting future provision for plan

making purposes. Therefore, the LAA/APR Rate of 1.24mtpa (the 6-year sales average) gives a NPPF maintained landbank of 11.97 years. This is insufficient to meet the anticipated reviewed Plan's needs to 2039 (plus 10 years) from 2024. Table 14 overleaf details the crushed (hard) rock sales 2013-2022.

Table 14: Landwon Aggregates Sales Crushed Rock 2013-22

Year	Sales (Tonnes)
2013	526,281
2014	722,985
2015	767,198
2016	727,272
2017	1,061,529
2018	1,083,122
2019	1,349,319
2020	1,508,239
2021	1,200,433
2022	1,242,839
Sales Average last 10-years (2012-21)	**1,018,922**
Sales Average last 6-years (2012-21)	**1,240,914**
Sales Average last 3-years (2019-21)	**1,317,170**

Source: Aggregate Monitoring Surveys, 2013-2022

Future Potential Requirements and Resources - Emerging Full Review of the Kent Minerals and Waste Local Plan 2024 - 2039

7.15 The County Council adopted the Kent Mineral Sites Plan in September 2020. It identified the required 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 the plan horizon of 2030. There was a Call for Sites exercise in late 2016 into early 2017 that resulted in several sites coming forward to meet soft sand and sharp sand and gravel requirements. No sites for hard rock were promoted, given there was no identified need at that time. Three sites were allocated in the Kent Mineral Sites Plan. Table 15 overleaf details the sites considered as part of the Mineral Sites Plan process that led to the adoption of the 2020 Plan.

Table 15: Mineral Sites Plan (adopted 2020) Sites for Landwon Aggregates and Other Potential Resources

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

7.16 To date none of the sites allocated have received planning permission.

7.17 In 2020 a formal review of the adopted Kent Minerals and Waste Local Plan 2013-30 was initiated. Amongst other matters and using 2022 aggregate monitoring data, a modification to Policy CSM 2: Supply of Land-won Minerals in Kent is proposed to ensure the plan period had a 15-year horizon. The effect of this change was to re-assess aggregate supply needs until that time. A Regulation 18 public consultation was held in the summer of 2022 detailing the further modifications and supporting text for policy CSM 2: Supply of Land-won Minerals in Kent.

7.18 The recent local plan work has identified that for sharp sand and gravels, the declining 10-year sales average together with a reported increase in the reserves, along with the replenishments from the two allocations in the adopted Mineral Sites Plan would result in a surplus above projected need between 2024-39. This did not hold for either soft sand or hard rock supply from existing reserves and the allocation at Chapel Farm, Lenham (soft sand) in the adopted Mineral Sites Plan. The projected soft sand supply falls below an at least 7-year landbank towards the end of the anticipated Plan period of 2039 but does not exhaust. The hard

(crushed) rock reserves coupled with use of a 6-year sales average results in a significant deficit over the NPPF requirements over the anticipated extended plan period. The following sections discuss these findings in more detail.

Sharp Sand and Gravel

7.19 Regarding the sharp sands and gravel position, the available landbank is 12.67 years as of the end of 2022. By the start of the anticipated reviewed plan period, it will be 11.67 years. Both are above the NPPF at least 7-years requirements. Maintaining this landbank through the entire anticipated reviewed plan period to 2039 will require the 2.50mt of allocated resources becoming available as replenishing reserves. If that occurs the following calculation demonstrates reserves will result in a marginal surplus by 2039:

Plan period is 15 years plus 7 for the maintained 7-year land bank (1.232mt) at the end of the Plan period (2024 to 2039+7) giving a total time= 22 years

*The plan period runs from 1st January 2024 to the 1st January 2039 sharp sand and gravel requirement is 0.176 x 22= 3.872mt; available reserves in commencement of year 2024 will be 2.054mt giving a **1.818mt shortfall** over the projected Plan period. An addition of **2.50mt** from the Mineral Sites Plan allocations would turn the **1.818mt projected shortfall into a 0.682mt surplus.***

7.20 However, this position is essentially a 'snapshot' in time. As the sales per annum fall away, the landwon contribution of supply will slowly become even less important. It appears that more sand and gravel will continue to be imported to meet the demand for this material, rather than further landwon extraction. Further monitoring will demonstrate if this is the case.

Soft Sands

7.21 The existing reserves of soft sand had undergone further re-evaluation in 2021 and as of 2021 they were recorded as having reduced to 6.22mt. This compares to those reported in 2020 as having increased to 9.34mt down from 7.8mt reported in 2019. As of the end of 2022 (AM2023) the available reserves were 5.574mt, with the 10-year sales average having slightly increased to 0.475mtpa and the 7-year landbank is 3.325mt. Given this reserve position and extraction rate there are insufficient available reserves to meet the Reviewed KMWLP soft sand requirements (to 2039). However, the soft sand requirements should be considered in the context of:

- the allocated site that has 3.2mt of potential reserves (Chapel Farm), and
- any ‘windfall’ resources including those accruing from mineral safeguarding prior extraction,

7.22 The following soft sand requirements for the anticipated extended Plan period are calculated below:

Estimated reserves at the end of 2022 are now 573,784 or 5.574mt,10-year sales average is 0.475mtpa (the LAA/APR rate) Plan period (2024 to 2039) is 15 years plus 7 for the maintained 7-year land bank at the end of the Plan period, total time = 22 years.

Total Plan requirement is 15 x 0.475 = 7.125mt plus a 7-year landbank at end of Plan period (which is 3.325mt) this gives 10.45mt overall Plan requirement

*Reserves in year 2024 are estimated at 5.099mt with a 3.20mt replenishment from the allocation at Chapel Farm, it is anticipated that available reserves over the Plan period will be 8.299mt. Therefore **10.45** minus **8.299mt** gives a **2.15mt shortfall** over the Plan period.*

7.23 Again, the sales average rate and available reserves are a ‘snapshot’ in time. Both can change with increased or decreased extraction rates and re-evaluation of the reserve base., along with potential ‘windfall’ resources becoming available. These are set out, as far as current available information can inform, in Table 16 below.

Table 16: Other Potential ‘Windfall’ Resources Folkestone Formation 2024-39

Area	Site	Mineral Yield (tonnes)	Notes
Sevenoaks District	Potential sites identified in the Regulation 18 2023 consultation local plan 2040: HO21, HO28, HO32 and MX13 that affect the Folkestone Formation (soft sand)	Unknown	At this stage of the local plan formulation and consultation process, no data on yield from potential prior extraction of ‘windfall’ resources, plan length to 2040 is largely therefore coincident with the KMWLP review plan period. All emerging allocations affecting safeguarded mineral resources need to satisfy safeguarding policies and demonstrate that prior

			extraction is not an option.
Maidstone Borough	Heathlands Garden Community. Strategic site part of the emerging Maidstone Local Plan Review to 2031	Unknown	Chapel Farm allocation (3.2mt) in Kent Mineral Sites Plan is coincident with the new settlement and will require prior extraction, also other areas of the Folkestone Formation are affected by the proposed settlement and thus further scope for prior extraction exists
Tonbridge and Malling Borough	Adopted Local Plan 2022 Regulation 18 public consultation 2022	Unknown	The Medway Gap area of future spatial development focus is partially coincident with the Folkestone Formation, potential for sites to come forward that may have the potential for prior extraction..
Ashford Borough	Site S34 of the Ashford Borough Council Local Plan to 2030 identifies this site as possibly requiring prior extraction	Unknown-40 housing unit allocation	Statement of Common Ground signed on the 6 June 2018 stated: *'Prior to the grant of planning permission for non-minerals development at the site, the applicant shall prepare and submit a Minerals Assessment to establish whether any prior extraction of Minerals should take place in advance of residential development'*
Folkestone and Hythe District	Otterpool Park new Garden Town part of the Folkestone and Hythe Local Plan Core Strategy Review 2022 as a major Strategic Site Allocation [now a planning application]	Circa 0.84mt	The submitted Minerals Assessment (Ref OP5 Appendix 17.2) identified the potential resource of 0.84mt. It has been agreed that this matter will be further addressed as a planning condition of any planning permission subsequently granted to the proposal.

7.24 The full potential for 'windfall' resources to come forward over the anticipated extended Plan period is not fully determined at this time. However, it appears that it may range between 0.84-1.0+mt of soft sand. That potential resource input, together with the existing permitted reserves and the adopted allocation at Chapel Farm, Lenham means that an adequate and steady supply of soft sand will be maintained over most of the Plan period. Moreover, the requirement to review all plans, including the anticipated Full Review of the Kent Minerals and Waste Local Plan 2024-39, every 5 years will allow regular monitoring and changes in circumstances to inform need and to plan accordingly.

Crushed Hard Rock

7.25 In the past, the consented reserves of hard (crushable) rock of the Hythe Formation in Kent were considered as being so extensive there was no need to consider future supply needs and no sites were proposed in the Mineral Sites Plan that was adopted in 2020. Since then, however 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 of over 1.0+mtpa since 2017 leading to the recognition that the 6-year sales average is the more realistic proxy to use to estimate yearly sales. The implications of this and the anticipated extended Plan period are such that there is a predicted short fall of reserves for the anticipated Plan period (2024- 2039).

7.26 The inadequacy of the available landbank over the proposed Plan period is illustrated using the following parameters:

- Estimated reserves at end of 2022 are 14,854,411 tonnes or 14.85mt
- 6-year sales average is 1.24mtpa
- 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

Total requirement is 15 x 1.24 = 18.6mt plus 10-year landbank at end of Plan period is 12.4mt that gives 31.0mt overall requirement. The Plan period runs from 1st January 2024 to the 1st of January 2039. Reserves in 2024 at year commencement (1 January 2024) are 13.618mt-31mt, therefore minus 31.0mt (the Plan requirement) give a ***shortfall*** *of* ***17.38mt*** *over the Plan period.*

7.27 Given the anticipated extended Plan length (until end 2039 plus 10 years) there are compelling grounds for identification of further hard rock resources. To enable a steady and adequate supply of hard (crushed) rock over the anticipated extended Plan period, this could include a sound allocation in a revised Mineral Site Plan or by importation.

Productive Capacity

7.28 The monitoring survey undertaken in 2023 was incomplete in terms of productive capacity, due to the low participation in the landwon sector. The data in AM2022 to gather 2021 data in this regard is therefore relied upon. However productive capacity of the recycled/secondary aggregate sector and for wharves and rail depots was updated and represents the latest position in

Kent. The amalgamated reported productive capacities are shown in Table 16 below.

Table 16: Total Sales and Estimated Production Capacity 2021 and 2022 (million tonnes per annum)

	Sales (mt) 2022	Productive Capacity (mtpa) 2021 & 2022	Sales/Production Capacity %	Capacity Headroom
Landwon Aggregate				
• *Soft Sands*	0.574	1.045mtpa	55.2%	44.8%
• *Sharp Sands and Gravels*	0.124	0.75mtpa	16.5%	83.5%
• *Crushed Rock*	1.240	2.0mtpa	62%	38%
Wharves	3.590	8.210mtpa	43.7%	56.3%
Rail Depots	0.363	2.225mtpa	16.31%	83.69%
Recycling/Secondary	0.802	4.00mtpa	20.05%	79.95%

Source: Aggregate Monitoring Survey 2021 and 2022 and previous wharf capacity work (2010) undertaken to support the adopted Plan

7.29 It is recognised that capacity information will become increasingly important in future years, particularly in relation to wharves and rail depots. The 2017[9] study 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 or landwon materials from other locations, 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.

7.30 Kent still has significant unused capacity in its wharfage, as it appears to be operating at approximately 44% capacity at the end of 2022 (leaving 56% headroom) This is an increase over 2021, possibly due to improved facilities being in place. However, loss of any wharf site will be, largely irreplaceable and so others will need to increase their throughputs to compensate for lost capacity.

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

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.

7.31 Although rail importation has even further potential to increase throughput, with some 84% headroom of unused capacity rail connectivity remains, like wharf location, somewhat fixed in place. Though their full potential is underutilised they are located in Kent's hinterland and play a role in providing importation, particularly hard rock, away from the coastal locations. Therefore, rail depots in Kent will be important in the future and should continue to be safeguarded. This will ensure that their operational capacity can be ramped up as necessary to compensate for any declining landwon supply, allowing for importation to continue and potentially increase in Kent's hinterland.

7.28 The secondary and recycled aggregates are showing a slight decrease in sales, and there is significant capacity to be further utilised if sufficient market demand ramps up production in this sector. Landwon soft sand extraction capacity remains below its full productive potential by 44%, 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 be 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.

8.0 Overall Conclusions of the Local Aggregate Assessment

8.1 This LAA is based upon data for 2022. It highlights that Kent is producing slightly more aggregate overall in 2022 than the 6.47mt in 2021. This increase indicates the overall aggregate producing sector continued to recover from the low recorded in 2019 (3.61mt). However, there appears to be, over time, an apparent increasing shift towards higher levels of importation, with particular regard to sand and gravels and hard rock importation has marginally reduced, although the 10-year sales average show an increasing trend.

8.2 The landwon sharp sands and gravels continue to decline as a share of overall supply expressed as sales. Extraction has almost ceased in Kent with one operational quarry (Denge Quarry) and all extraction at Lydd having moved over the border into East Sussex (although 50% of sales are counted as those from Kent). The importance of importation, primarily via wharves, appears now set to be the pattern for future supply of this type of material. In 2022 1.906mt of sales were recorded, the highest in the last 10 years, and sales in 2021 were 1.770mt. This clearly indicates that the industry is further increasing imports (over wharves) to meet demand. The level of headroom of importation capacity for both rail depots and wharves remain significant to continue to allow this shift. The marine dredged sands and gravels are largely like landwon deposits, whilst not exactly in particulate size distribution, 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. It appears that they are fully capable of meeting the market requirements in terms of specification for construction aggregate use without significant input from the landwon reserves.

8.3 The landwon soft sands have significant remaining productive capacity headroom, although the reserves have contracted on re-evaluation (in 2021) and by further extraction in 2022. If sales were to increase substantially above the 0.50mtpa the sector can respond, although there is a potential shortfall of a maintained at least 7-year landbank over the emerging KMWLP Plan period (to 2039). However, this is towards the end of the plan period (estimated as 2036) and without exhaustion of reserves at the end of the Plan. Moreover, ‘windfall’ reserves in the form of mineral safeguarding prior extraction ahead of otherwise sterilising development identified in Kent is anticipated to become available over this plan period. This may be a potential replenishing source of soft sand in the region of some 1.0+mt. This, together with the current low economic condition of the UK economy, as seen in low GDP growth, and a lack of change to the lowering through time forecasted housing projections, is considered likely to depress demand of this aggregate mineral. Further monitoring of the soft sand supply sector through the LAA and plan review process will demonstrate if any further allocations will be required. The Formal review of the KMWLP (adopted in 2016) is currently ongoing.

Assuming adoption in late 2024/25 the required further five yearly formal review process will keep the matter under consideration. At present, it is considered that there are no compelling grounds to conduct an early partial 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 Kent LAAs. The landbank has significantly reduced to 14.85mt. The rate of extraction in 2017 into 2022 had significantly increased over what had been previously reported. It is clear now that there are insufficient reserves over the emerging Plan period to 2039. Therefore, further reserves are required in order to maintain a steady and adequate supply of hard crushed landwon aggregate in accordance with NPPF requirements to 2039. The Minerals Sites Plan is currently being reviewed to consider potential allocations. If a land allocation is not possible, then further increases in importation via wharves and rail depots would have to make up the difference once the current landwon reserves are exhausted, currently estimated to be to be around 2034/5.

8.5 The recycled and secondary sales in 2021 were over 1.0mtpa, as of 2022 they have fallen back to 0.843mt, indicating that the importance of the sector is around the 1.0mtpa level. However, it is considered to be an 'under reported' sector in aggregate monitoring. In addition, productive capacity is thought 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 Construction, Demolition and Excavation (CDE) 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. It appears from the returns that sales could be around the 1.0mtpa level (as reported) and will be generally available, and that any increases may be marginal. 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 supply source 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 will remain paramount. All indications are that they will remain a growing important element in maintaining overall primary aggregate 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 are now of far greater importance for this aggregate type. It may also be the case if further allocations of landwon hard crushed are not secured, and supply has to rely upon imports. As a result, future security of supply of

primary 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 arguably would supply Kent's interior demand more efficiently than coastal locations. It is however noted that rail depots are fewer in number and the overall capacity is lower than that of the wharves along Kent's coast. The wharves also have a significant clustering in the lower reaches of the river Thames in Kent, thus reducing their overall distribution. The rail depots partially compensate for this uneven distribution.