



Cambridgeshire and Peterborough Local Aggregates Assessment 2022

Covering the Year 2022

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*Executive Summary for Calendar Year 2022**Table 1 Executive Summary Dashboard for Sand and Gravel for Year 2022*

	Performance in 2022	In comparison with previous year (in brackets)
Land-won sand & gravel sales (million tonnes, Mt)	3.035	↓ -0.445(3.48)
Permitted reserves of sand & gravel (Mt)	32.391 ¹	↓ -1.479 (33.87)
Annual production as a percentage of Apportionment figure	117%	↓ -17% (134%)
Landbank based on 10 years sales average (years)	11.00	↓ -1.22 (12.22)
Landbank based on 3 years sales average (years)	10.3	↓ 0.14 (10.44)
Landbank based on Local Plan provision figures (years)	12.46	↑ -0.69 (13.02)
No. of Allocated Sites	9 ²	↔ 9 (9)
Potential remaining yield (Mt) from allocated sites	15.16	↓ -2.46 (17.62 ²)

¹ This figure is based on operator returns and does not include 2.1mt of resource that has received planning permission but has not yet been implemented.

² The Cambridgeshire and Peterborough Minerals and Waste Local Plan was adopted in July 2021.

Table 2 Executive Summary for Calendar Year 2022

	Sales (Mt)	Av. (10 y) Sales (Mt)	Av. (3 y) Sales (Mt)	Trend	LAA Rate (Mt)	Reserves (Mt.)	Land - bank (Yrs.)	Comments
Sharp Sand & Gravel	-	-	-	-	-	-	-	None.
Soft Sand	-	-	-	-	-	-	-	None.
All Sand & Gravel	3.035	2.891	3.113	↔	2.6	32.391	12.46	The 'LAA Rate' is the provision rate in the Minerals and Waste Local Plan that was the relevant document in 2022 and the landbank is based on this rate.
Crushed Rock	0.66	0.234	0.61	↓	0.3	2.87	9.81	The 'LAA Rate' is the provision rate in the Minerals and Waste Local Plan that was the relevant document in 2022 and the landbank is based on this rate.
Recycled/Secondary Aggregates	0.46	0.57	0.46	Unclear	N/A	N/A	N/A	No target contained within Minerals and Waste Local Plan
Marine Sand & Gravel	-	-	-	N/A	-	N/A	N/A	N/A for Cambridgeshire & Peterborough
Rock Imports by Sea	-	-	-	N/A	-	N/A	N/A	N/A for Cambridgeshire & Peterborough

Rail Depot Sales (S&G)	-	-	-	N/A	-	N/A	N/A	Not available.
Rail Depot Sales (Crushed Rock)	-	-	-	N/A	-	N/A	N/A	Not available.

Comment

The sales of sand and gravel decreased slightly, and the steady and adequate supply was maintained. The landbank of limestone (crushed rock) reduced slightly. The limestone reserve is restricted to a small area to the west of Peterborough.

Introduction

1. Minerals are important to the local and national economy and play an important part in our everyday lives. They have many uses, particularly for the provision of material for construction and for a wide variety of other industrial and commercial purposes, including the manufacture of bricks, blocks, tiles, paint, paper and toothpaste. Minerals are essential to the growth agenda in which Cambridgeshire and Peterborough have an important role to play.
2. The planning system must ensure that sites are available to provide sufficient minerals to supply these industries and this is achieved through Minerals Local Plans. During 2022, the relevant Plan that guided development was the Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021).
3. Aggregate minerals are those that are used by the construction industry, for example in road construction, house building, the manufacture of concrete and for railway ballast. Locally they include sand and gravel, crushed rock (limestone) and recycled and secondary aggregates. It is the provision of these minerals with which this assessment is concerned.
4. This Local Aggregates Assessment is accompanied by a Data Book (spreadsheet) that can be found on the same [webpage](#) as this document.

Background

5. The National Planning Policy Framework (NPPF) (2023) requires Mineral Planning Authorities to plan for a steady and adequate supply of aggregates by determining their own levels of aggregate provision. This should be assessed through the preparation of a Local Aggregates Assessment (LAA), which must set out a rolling average of the previous 10 years and include other relevant information. An assessment of all supply options should also be factored in, where appropriate. It is also advised that published national and sub-national guidelines on future provision should be taken into account.
6. This LAA sets out the current and future situation in Cambridgeshire and Peterborough in terms of aggregate supply and demand including sales data as well as a rolling average of 10 years sales data. The LAA reports key information used to monitor the progress and effectiveness of the Cambridgeshire and Peterborough Minerals and Waste Local Plan (hereafter referred to as 'the Plan').

National and Local Context for Growth

7. The economic situation in Cambridgeshire and Peterborough is influenced by the wider UK economy. In 2022 the UK was recovering from the Covid 19 pandemic. Emergency Public health restrictions which had first been introduced in 2020 were

fully removed during February 2022. More recently the Bank of England has been steadily increasing the Bank's interest rate, which in time will make borrowing for the public and businesses more expensive. This may affect the level of demand within the economy as a whole.

8. The Minerals and Waste Local Plan seeks to ensure a steady, adequate but sustainable supply of minerals to meet current and projected future need. This will support the future growth identified within the Cities and Districts within Cambridgeshire and Peterborough. Between 2014 and 2022 housing completions have varied between 3,498 to 4,912 annually, broadly increasing over time. The Cambridgeshire and Peterborough local planning authorities have identified in their five-year housing supply reports that an additional 22,473 dwellings are currently identified as commitments to be completed between April 2022 and March 2027.
9. The largest recent major infrastructure project in the Plan area, which had significant call on local mineral reserves was the improvement of the A14 between Cambridge and Huntingdon and Brampton in Cambridgeshire which was completed during 2020. During 2021 the proposed improvement of the A428 between Bedford and Caxton Gibbet in Cambridgeshire was submitted to Government as a Nationally Significant Infrastructure Project. A Public Examination was held and in 2022 a Development Consent Order for the development was issued. It is anticipated that construction will commence during 2023. A proposal for duelling the A47 between Peterborough and Great Yarmouth was also progressed by Highways England during 2022.
10. The Mineral Planning Authorities monitor the strength and scale of local economic growth via the planning application system, tracking changes in the number of planning applications for a range of different land-uses and regular site monitoring of development proposals with planning permission to measure local economic activity. They also work closely with the Local District Planning Authorities to understand and note their growth-related infrastructure requirements.

Local Aggregates Supply and Demand in a National and Regional Context

11. This section of the assessment looks at local sales, consumption, import and exports of aggregates within the national and regional context. The figures are taken from the 2019 Aggregate Minerals Survey, a four yearly survey produced by British Geological Survey on behalf of the Ministry of Housing, Communities and Local Government (MHCLG) (formerly the Department of Communities and Local Government (DCLG) and now the Department for Levelling Up, Communities and Housing (DLUCH)) which reports on the movement of aggregates between Mineral

Planning Authorities (MPAs) and regions. The sales figures relate to the area in which the material was quarried and reflect weighbridge tonnages of materials leaving sites.

England & Wales, East of England, and Cambridgeshire & Peterborough

Aggregates Sales 2019

12. Total sales of sand and gravel and crushed rock produced for aggregate purposes in England and Wales were 148.1 mt in 2019. Sales in the East of England were 11.3 mt (7.6%).
13. For landwon sand and gravel only, the sales for England and Wales were 40.9 mt, with sales for aggregate purposes of 10.8 mt recorded in the East of England. Cambridgeshire and Peterborough had sales of 3.2 mt in 2019. This means Cambridgeshire and Peterborough accounted for a total of 6.1% of landwon sand and gravel sales in England and Wales and 28% of total sales for the East of England.
14. The marine-dredged sand and gravel sales for the East of England were 0.35 mt and have traditionally been a small percentage of the total produced in England and Wales. No marine-dredged sand and gravel sales were reported in Cambridgeshire and Peterborough (sales are allocated to location of landing wharf), only the port of Wisbech has the potential capacity to achieve this within Cambridgeshire and Peterborough but it is not currently used for this purpose.
15. Note, marine aggregate extraction is governed by the UK Marine Policy Statement (MPS) (March 2011), and the East Inshore and Offshore Marine Plans (April 2014). The MPS provides the framework for preparing Marine Plans and taking decisions affecting the marine environment. Marine Plans aim to manage and balance the many activities, resources and assets in the marine environment. This framework of plans overlaps with the terrestrial planning system, which is covered by the Local Plan, between the mean high and mean low tidal ranges.
16. Crushed rock sales recorded in 2019 sales from the East of England were 104,000 tonnes. This was a small proportion, less than 1%, of the total sales for England and Wales which was 95.8 mt.

Aggregates Consumption 2019

17. Consumption - Total apparent consumption of primary aggregates (sand and gravel and crushed rock) in England and Wales was 149.8 mt in 2019. Consumption in the East of England was 21.2 mt.
18. Exports of primary aggregates were 10.1 mt for sand and gravel and 30.49 mt for crushed rock, and imports were 8.23 and 34.13 respectively; making England and

Wales combined, a marginal net importer of primary aggregates. Exports for the East of England were 1.1 mt of sand and gravel, and 0.02 mt of crushed rock; and imports were 2.27 mt of sand and gravel and 8.8 mt of crushed rock making the East of England a net importer of primary aggregates.

19. In 2019 within the East of England, the consumption of 10.4 mt of landwon sand and gravel was less than sales of 10.7 mt, indicating that the appears to be broadly balanced, leaning towards being a net exporter.
20. Landwon sand and gravel is exported to other regions (export to other countries is insignificant). In 2019 the East of England region both exported and imported landwon sand and gravel, primarily trading with the East Midlands, London and the South East regions.
21. Within the East of England, the consumption of marine dredged sand and gravel was 1.8 mt.
22. Crushed rock consumption in England and Wales totalled 99.5 mt. Within the region, Cambridgeshire and Peterborough consumed 1.8 mt, the highest amount of all the mineral planning areas in the region. The figures indicate that both the East of England and the Cambridgeshire and Peterborough area are both significant net importers of crushed rock.
23. Ensuring a steady and sufficient supply of minerals for the construction needs of the nation cannot be achieved on a regional or sub-regional self-sufficiency basis owing to the imperfect distribution of mineral reserves. However, the UK as a whole meets the majority of its own aggregates needs. For this reason, each sub-region must play its part in ensuring a continued supply, whilst taking account of alternative supplies (such as marine dredged aggregates) alternative materials (secondary and recycled aggregates) and environmental constraints, all of which can affect supply at the local level; and substitute construction methods and materials such as glass, wood, and plastics, which can affect future demand for landwon aggregates.

Local Aggregates Geology and Planning

24. Mineral resources are natural concentrations of minerals or bodies of rock that are, or may become, of potential economic interest as a basis for the extraction of a commodity. That part of a mineral resource which has been fully evaluated and is commercially viable to work, is called a mineral reserve.
25. In the context of land-use planning, further terms are applied, namely 'allocated resource' and 'permitted reserves'. The term 'allocated resource' relates to land that has been allocated in a Local Plan. In Cambridgeshire and Peterborough, for the monitoring period for 2022, this is set out in the Plan, which was adopted during July

2021, and allocated land suitable for mineral extraction. The term 'permitted reserves' is limited to those minerals for which a valid planning permission for extraction exists.

26. The economic potential of individual sites can only be proved by a detailed evaluation programme. Such an investigation is an essential precursor to submitting a planning application for mineral working.
27. The geology of primary interest for the Cambridgeshire and Peterborough Local Aggregates Assessment is sand and gravel and crushed rock aggregate (limestone).

Sand and Gravel in Cambridgeshire & Peterborough

28. Sand and gravel are defined on the basis of a particle size rather than composition. Commercially, the term 'gravel' is used for material that is coarser than 5mm, with a maximum size of 40mm, and the term 'sand' is used for material that is finer than 5mm (but coarser than 0.075mm). The principal uses of sand are as fine aggregate in concrete, mortar and asphalt. The main use of gravel is as a coarse aggregate in concrete. Substantial quantities of sand and gravel may also be used for construction fill.
29. In the Cambridgeshire and Peterborough plan area, sand and gravel resources occur mainly within superficial or 'drift' deposits, subdivided into river sand and gravel, glacial deposits, head deposits and bedrock sand.
30. River sand and gravel (terrace and sub-alluvial deposits) – resources occur in both raised river terrace sequences flanking the modern floodplains and in floodplain terrace deposits associated with, and underlying, present day alluvium. The main sources of these materials in Cambridgeshire and Peterborough are Quaternary and Recent Age deposits in the valleys of the Nene, Ouse, Welland, Granta and Cam, where generally clean, well bedded sand and gravels rests on weathered bedrock or chalky till. The quality of these deposits can vary along the river valleys. Included within these resources is what is known as Fen Gravel or Fen Edge deposits which form a discontinuous spread at the edge of the Fens and extend up to the present-day valleys.
31. The Fen Gravel/Fen Edge sand and gravel deposits are good quality. The principal existing and allocated strategic sand and gravel sites are in areas with Fen Edge deposits. These sites will supply the majority of Cambridgeshire and Peterborough's sand and gravel needs.
32. Glacial sand and gravel deposits – In Cambridgeshire and Peterborough, the glaciofluvial deposits are mainly located in the southeast around Cambridge.

Deposits are highly variable in nature and may appear as sheet or delta-like deposits or as elongated irregular lenses.

33. Head deposits – these comprise gravelly deposits that have been involved in mass movement downslope to their present position. Most deposits have significant clay content and many deposits can be worked as ‘hoggin’. In Cambridgeshire and Peterborough these deposits tend to be less economically significant and are restricted to low quality isolated patches lying at heights between 35m and 60m above ordnance datum (AOD).
34. Head deposits have low value and are generally only used as raised. Intense production of sand and gravel from these deposits is not required.
35. Bedrock sand – these resources are mostly confined to the Woburn Sands Formation, which has a narrow outcrop across Cambridgeshire from Gamlingay to Ely and thins north-eastwards. Sand from this formation has been worked in the past but there is currently no extraction of this resource within the Plan area.

Crushed rock aggregates in Cambridgeshire and Peterborough

36. Cambridgeshire and Peterborough have limited resources of rock suitable for crushed rock aggregate. Higher quality aggregates are required for coating with bitumen for road surfacing, or for mixing with cement to produce concrete. For applications such as constructional fill and drainage media, with less demanding specifications, lower quality materials are acceptable.
37. Limestone – the Lincolnshire Limestone Formation (inferior oolite) crops out in the north-west of the Plan area, west and north west of Peterborough, where it forms part of a prominent limestone outcrop running south to north through Corby, Stamford, Grantham and Lincoln.
38. A very small amount of limestone is worked for building stone within the plan area. Most limestone in this area is worked to provide aggregates of relatively low strength and with poor resistance to frost damage, and therefore generally used as construction fill or as sub-base roadstone material.
39. To the south of the plan area closer to Cambridge the Upware Limestone is quarried on a small scale for use as an agricultural lime and asphalt filler.

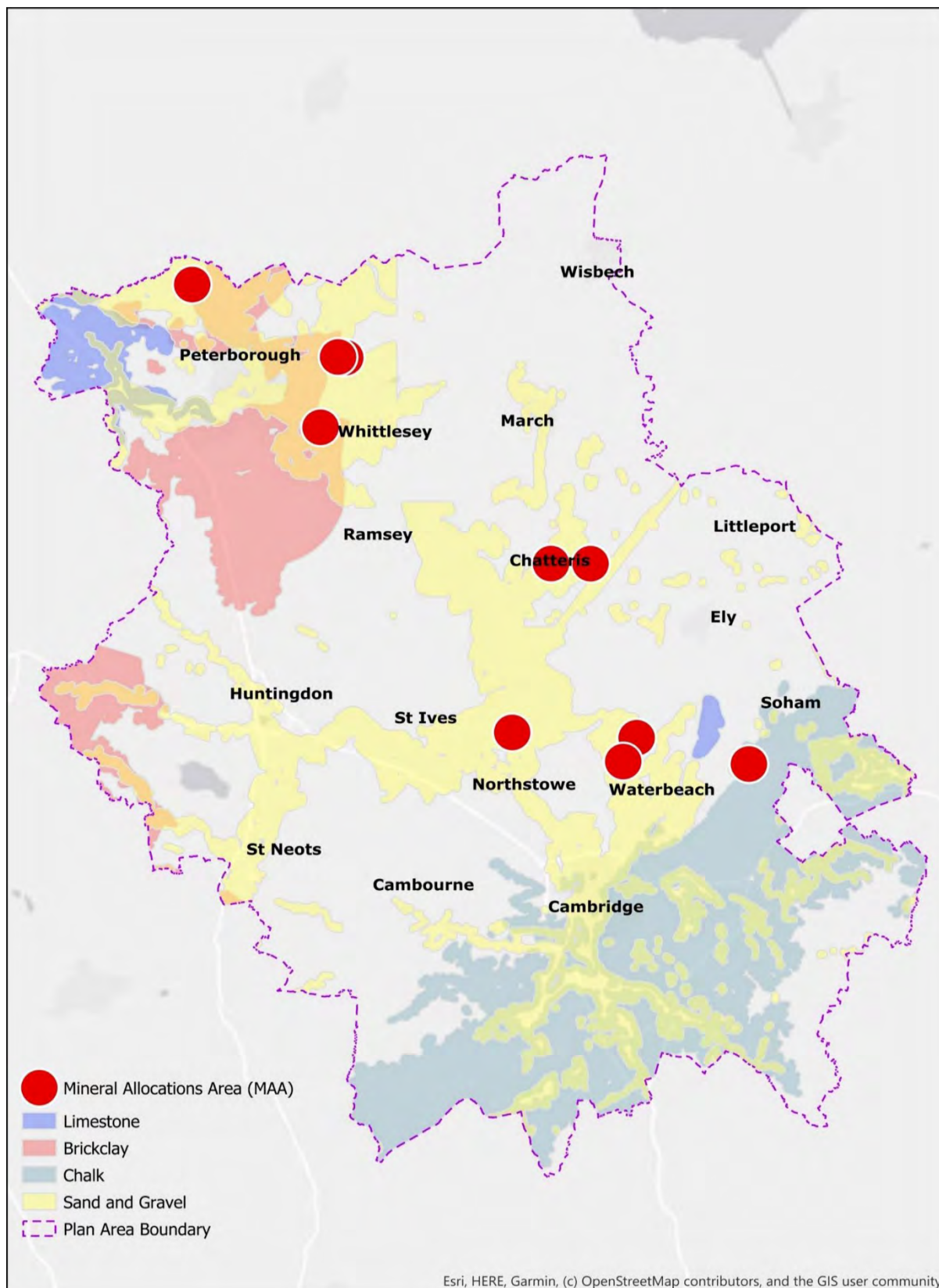


Figure 1 Cambridgeshire and Peterborough Minerals Key Diagram covering; Geology, Minerals Zones, Existing Facilities and Strategic Allocations (July 2021)

Cambridgeshire and Peterborough Assessment of Local Sand and Gravel Supply and Demand 2022

Current Supply

40. At the end of 2022 in Cambridgeshire and Peterborough there were 18 sand and gravel sites with planning permission of which 13 were active sites in 2022. The sites are listed in Table 3 below.

Table 3 Permitted sand and gravel extraction sites in Cambridgeshire and Peterborough, 2022

Site	Operator	Status of site during 2022
Cook's Hole, Peterborough ³	Augean	Active
Block Fen Quarry II, Cambs	Tarmac	Active
Block Fen Quarry, Cambs	Hanson Aggregates	Inactive
Bridge Farm Reservoir, Holme Fen Drove, Cambs	Mick George Ltd	Inactive
Coopers Farm, Land 500 Metres Southeast Of Langwood Fen Farm, Langwood Fen Drove, Chatteris, Cambridgeshire, PE16 6XF	Mick George Ltd	Not Yet Worked
Kennett, Cambs	Mick George Ltd	Inactive
Little Paxton, Cambs	Aggregate Industries UK Ltd	Active
Marsh Lane, Cambs	Land Logical	Active
Maxey Quarry, Peterborough	Tarmac Ltd	Active
Mepal Reservoirs, Cambs (ne Sutton Gault)	Frimstone (Mick George Ltd)	Active
Mitchell Hill Farm North, Waterbeach, Cambs	Mick George Ltd	Active
Must Farm Quarry (Cambridgeshire & Peterborough)	Forterra	Active

³ This site produces both crushed rock and sand and gravel.

Needingworth Quarry, Cambs	Hanson UK	Active
Pasture House Farm, Peterborough	Land Logical	Active
Pode Hole Quarry, Peterborough	Aggregate Industries UK Ltd	Active
Willow Hall Farm, Haddenham	Mick George Ltd	Not Yet Worked
Willow Hall Farm, Peterborough	PJ Thory	Active
Witcham Meadlands Quarry, Block Fen	Mick George Ltd	Active

41. Estimated permitted reserves of sand and gravel in Cambridgeshire and Peterborough total approximately 32.39 million tonnes in 2022. This figure is based on returned submitted by quarry operators in the LAA Area.
42. A permitted 2.1mt (21/00720/MMFUL) is yet to be included in the reserve as it was not included by the operator in their return. If 2.1mt included was included the reserve would be 34.49 million tonnes.
43. This stock of reserves with planning permission is known as the landbank. Government policy requires landbanks to be maintained for all primary aggregate minerals, with a required landbank period for sand and gravel of at least 7 years.
44. The planned rate of supply or debit is referred to as the 'Provision Rate'. The Minerals and Waste Local Plan adopted in July 20221 makes provision for an annual rate of extraction of 2.6 mt. The current length of landbank can therefore be calculated as follows:

$$\text{Landbank Period (years)} = \frac{\text{Landbank of permissions (tonnes)}}{\text{Annual Apportionment (tonnes per annum)}}$$

Table 4 Sand and Gravel Landbank Calculation

Description	Value
Landbank of permissions:	32.39 mt
Annual Apportionment:	2.6 mt
Landbank period:	12.46 years

45. The scale and location of permitted reserves, together with the associated site production capacities across Cambridgeshire and Peterborough is sufficient to ensure the future provision of sand and gravel supply at levels above the minimum requirement.

Future Provision of Sand and Gravel

46. To determine the future supply of sand and gravel, the previous years' sales data needs to be taken into account, together with published national and sub-national guidelines, as well as any other relevant information. A ten-year rolling average of sales is considered in the NPPF to be a valid approach for locally assessing an apportionment figure for two main reasons. Firstly, the period is short enough so that overly historic sales are not considered. Secondly, the period is also considered long enough to ensure that short-term fluctuations in sales do not mask a true evaluation of what is considered to be a suitable amount of mineral to provide. It was agreed by the East of England Aggregates Working Party on 2 November 2016 that, in the absence of any updated national guidelines, the default methodology for calculating sand and gravel needs in local plans should be that contained in the NPPF.
47. The table below shows the sales of sand and gravel as reported by operators in the Councils' Annual Monitoring Survey. The 10-year sales average for the year 2022 was 2.891 million tonnes per annum.

Table 5 Sales of sand and gravel in Cambridgeshire and Peterborough 2013 – 2022

Year	Sales (thousand tonnes)
2013	1,830
2014	2,580
2015	2,540
2016	2,564
2017	3,558
2018	3,200
2019	3,211 ⁴
2020	2,823
2021	3,482
2022	3,035

Annual Apportionment / Annual Provision

48. Over time, annual apportionments or provision targets have been set either by Government or through Local Plans of that era. Historic apportionments / targets are documented in previous Local Aggregate Assessments. The publication of the NPPF

⁴ Cambridgeshire and Peterborough Local Aggregates Assessment 2020 reports a figure of 3,422kt; this was based on survey returned. The British Geological Survey 2019 Survey returned a figure of 3,211kt. The 3,211kt figure is being used here for consistency with the East of England Aggregates Working Party Monitoring Report.

introduced the current way of planning to ensure future need is met, based on the calculated rolling average of 10 years sales data becoming the ‘annual requirement’ on which to roll forward plans. The Plan adopted in July 20221 makes provision for 2.6mtpa.

49. The chart below shows the historic sand and gravel sales, along with the local plan apportionment / level or provision, and the 10-year sales average (looking back), over time. In 2020 the 10-years sales average was 2.89mt which is above the Plan provision of 2.6mt. The three-year average of sales gives an apportionment of 3.113 million tonnes per annum over the period 2019 – 2022. If the 10-year sales average continues to remain above the target it will mean that existing and allocated sites are likely to be worked more quickly than anticipated in the Plan.

Figure 2 Sales of sand and gravel in Cambridgeshire and Peterborough 2002 – 2022 (inclusive) in comparison with annual apportionment / provision levels, and 10-year average sales.



50. For reference, the apportionment provision target was / is set out in the following documents:
- 2002-2013 – 2.82 million tonnes per annum based on revised national and regional guidelines for Aggregate Provision 2001-2016 published in 2003 and reflected in East of England Plan (May 2008)

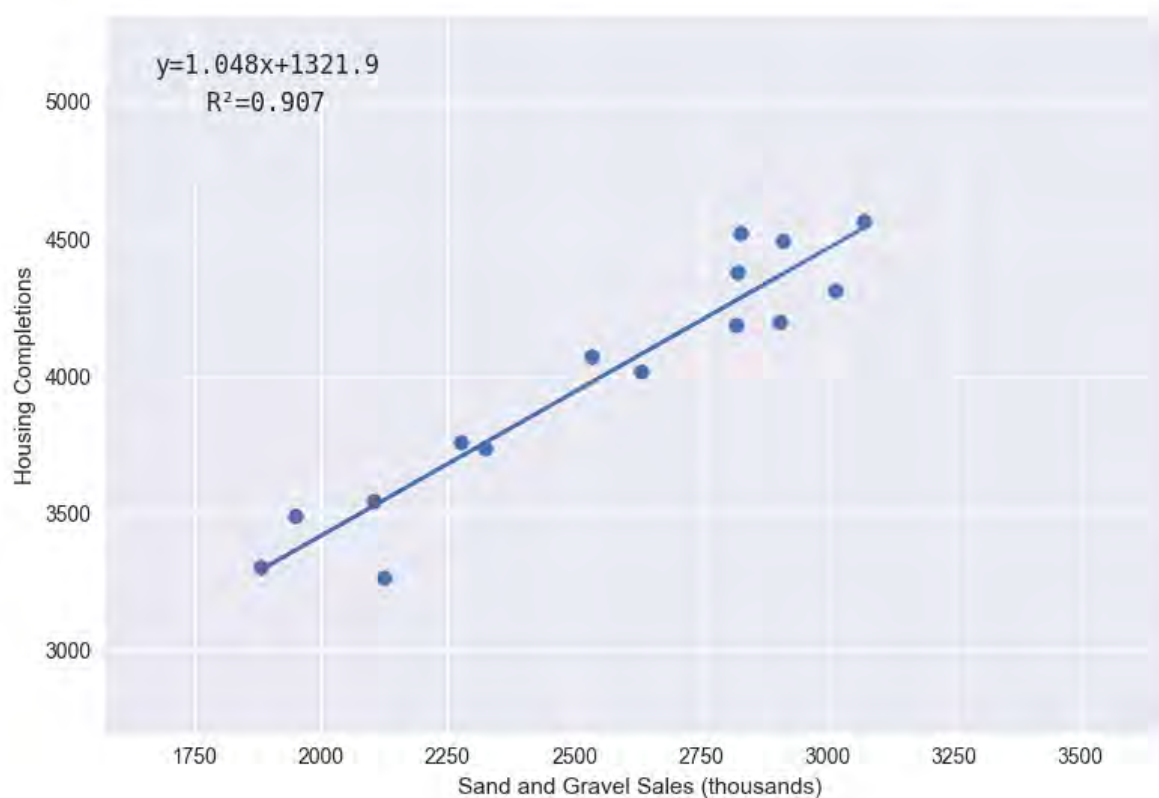
- 2014 – 2.88 million tonnes per annum based on revised national and regional guidelines for Aggregate Provision 2005-2020 published in June 2009, and reflected in Draft East of England Plan 2031 (Feb 2010)
- 2015-2020 – 3.0 million tonnes per annum based on Cambridgeshire and Peterborough Minerals and Waste Core Strategy Development Plan Document (July 2011)
- 2021 Onwards – 2.6 million tonnes per annum based on provision identified in Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021)

Estimating future sales demand

51. Predicting the future is difficult, but reasonable predictions can be made with reliable information; and the more tested a method of prediction is, the more reliable the resulting information is likely to become. This section sets out the beginnings of a future prediction of sales demand. It will be built upon in future Local Aggregate Assessments, improving the method where possible.
52. The 10-year sales average, as can be seen in the chart above, gives an indication of the historic levels of provision. The 10-year averages range between 2.299 mtpa and 2.891 mtpa, in contrast the annual sales vary between a much wider range of 1.7mtpa and 3.559mtpa. On its own, this gives an indication of the historic and current capacity of the minerals industry in Cambridgeshire and Peterborough. It provides a useful starting point but to forecast the future more information is required.
53. It is commonly believed that there is a correlation between housing completions and sand and gravel sales. Given that sand and gravel is required for the construction of a dwelling, this would seem a reasonable assumption. In the preparation of this Local Aggregates Assessment, time was spent testing whether this correlation exists in the Cambridgeshire and Peterborough, and if so, to what extent. It concluded that for any given single year, whilst there was some form of correlation (a correlation coefficient of 0.438 (R^2)), it was not strong enough to base any reasonable prediction on. To overcome this lack of correlation, it was decided to see if the use of average data could help, and this focused on a mean (average) centred on the data point, also referred to as the “mid mean (average)” in this document. To do this, an average is taken based on the central number in a dataset, so in this case five-year mid mean (average) looks two years forward and back when taking the mean average; this contrasts with the 10-year average above that looks back nine years from the year of the average. Of the three-year and the five-year mid mean (average) the five-year average performed best returning as a correlation coefficient

(R²) of 0.907 between sand and gravel sales and housing completions, which indicates a strong correlation⁵ between the datasets, and has the potential to be used in forecasting. This is illustrated in the chart below:

Figure 3 Five-Year Mid Mean (Average) Sand and Gravel Sales & Housing Completions



54. The formula below represents the calculated line of best fit for the relationship between five-year mid mean (average) sand and gravel sales and five-year mid mean (average) housing completions in Cambridgeshire and Peterborough:

$$\text{Sand and Gravel Sales} = (0.8653 * \text{housing completions}) - 904$$

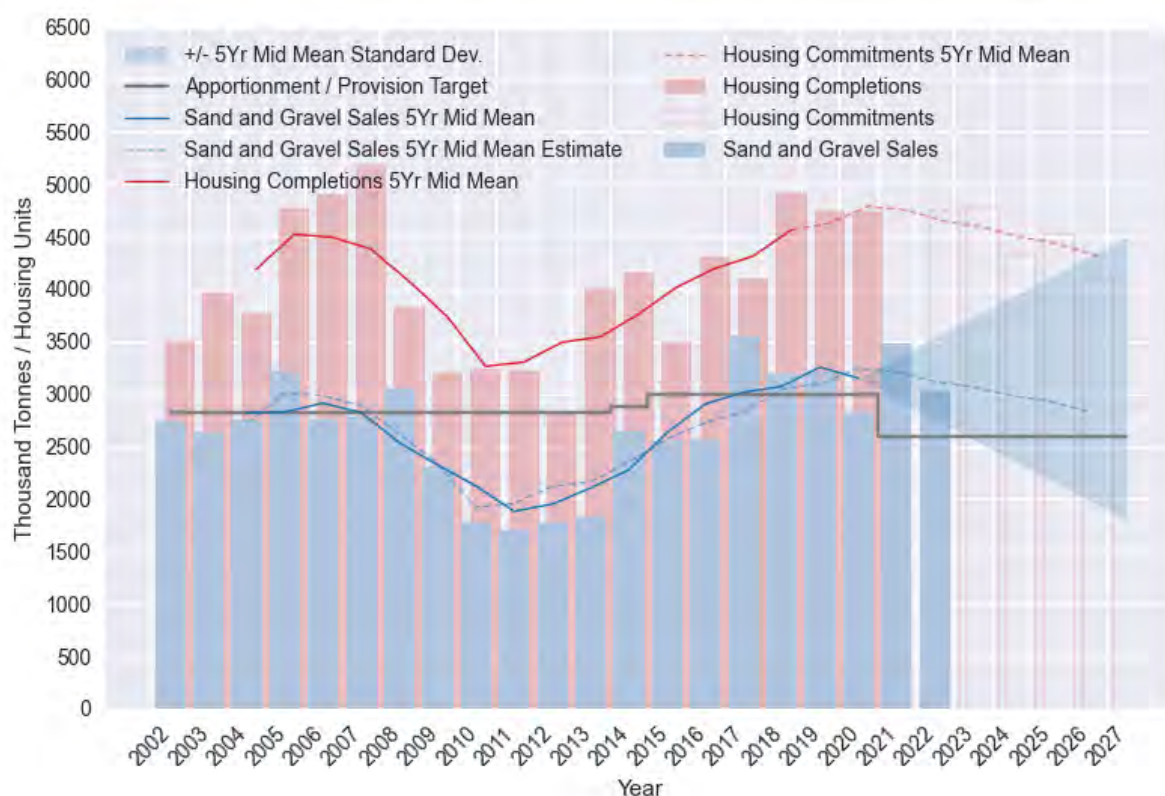
55. Subject to the amount of housing and sand and gravel being close to the range of historic provision, this formula provides a reasonable basis to forecast five-year mid mean (average) sand and gravel sales in Cambridgeshire and Peterborough. Further explanation for the basis of this statement can be found in Appendix 3.
56. Housing completions only provide a historic record of completions, but alongside completions, local planning authorities, as part of their five-year housing supply reports identify commitments in the coming years. These commitments are generally

⁵ A correlation coefficient of 0.0 means there is no correlation, between two datasets, and 1.0 means there is perfect correlation, i.e., it's possible to calculate one dataset from another with a known formula. Note, correlation does not mean there is a causal relationship, but given sand and gravel is used in the construction of dwellings, it is fair to infer that a relationship exists.

considered to be likely to be constructed in the timeframes set out in the reports. The likelihood of a commitment being completed has not been explored at this time. However, the commitments provide a reasonable basis for forecasting the most realistic scenario, even if it may be optimistic, in the near-term. Commitments between 2022/23 and 2026/27 have been collated. These indicate that housing provision is likely to decline from 4,747 in 2022/23 to 4,109 in 2026/27. Unfortunately owing to the data sources, completions / commitments for the year 2021/22 could not be sourced; and this may add some inaccuracy into the five-year average. It is hoped that this will be able to be corrected in future years.

57. The last two years of the five-year mid mean (average) for housing commitments has been calculated on the available data, i.e., four years and three years respectively. This is to provide the longest forecast possible. It is acknowledged that the accuracy for these years will deteriorate. It is hoped that this can be refined in future years when more longer-term data is added.
58. To compliment the trend line that was calculated off commitments, the standard deviation of the year-on-year change of the five-year mid mean (average) for sand and gravel sales has also been calculated. For this dataset the standard deviation is 192kt. This means that historically that 68.2% of the time the five-year mid mean (average) for sand and gravel sales will be within +/- 192kt of the value of the year before; this in comparison to the overall sales, which are in the order of 2.6-2.8mt. This will compound, when considered year on year, i.e., year 2 will be +/- 384kt.
59. All these elements are showing in the chart below. The blue bars are sand and gravel sales as reported by the Annual Monitoring Survey, and the red bars are housing completions. The hollow red bars are housing commitments. The solid lines are the five-year mid mean (average) for sand and gravel sales, in blue, and housing, completions in red. The grey solid line is the apportionment / provision target as a point of comparison. The red dotted line is the forecast five-year mid mean (average) once commitments are taken into account. The blue dotted line is the estimated sand and gravel sales based on the formula set out above using the five-year mid mean housing actual and estimate. The blue triangle shows the standard deviation of the change in the five-year mid mean (average) projected into the future.

Figure 4 Sand and Gravel Sales Forecast Estimate (5-Year Mid Mean Average Method)



60. It is known that the 5-year mid mean (average) method has limitations. The most obvious of those being that commitments may not result in completions, and these will be affected by economic conditions. The effect of the 2008 recession can be clearly seen in both housing completions and sand and gravel sales, and the standard deviation value is also influenced by those years of decline and recovery. Consequently, the standard deviation figure does provide a reasonable guide as to what can happen in both a recession and recovery.
61. In terms of recent economic conditions, following a recovery from the pandemic which depressed economic output, Russia's invasion of Ukraine resulted in significant increases in the cost of energy. This, among other factors, has resulted in the Bank of England raising interests from what were historic low levels, which is translating into higher borrowing costs for industry and a constriction in the availability of mortgages. The scale and speed of the impact of the increase in interest rates is currently unknown, but it is generally considered that it will result in reduced sales of housing and sand and gravel.
62. In this context, the estimated trend line shown in dashed blue above is likely to be an optimistic version of the future; but equally, there does not appear to be evidence of a recession quite yet either. Based on the housing commitments, and assuming the equation above remains accurate, the forecast showing, from its current level, a

steady decline in average sales, appears reasonable. This forecast estimated trend will be reviewed for its accuracy in future Local Aggregates Assessment.

63. This method is based on, and assumes, that the status quo in terms of sand and gravel demand and supply will remain similar to the period on which the equation is based. Should either of these elements change, e.g., houses start to be built out of wood, or local sand and gravel resources becoming exhausted, then the relationship between housing completions and sand and gravel sales would change.
64. If the forecast proves reliable, and the relationship between commitments / plan provision and completions is established, this may form the basis of a more accurate forecast than the 10-year sales average.
65. The data behind the chart above can be found in the datasheet (spreadsheet) that has been published alongside this document.

Demand estimate over remaining plan period.

66. As an indication of the likely future demand for sand and gravel the table below illustrates the estimated tonnages likely to be required based on the forward projection of historic sales during the plan period.

Table 6 Demand estimate for sand and gravel over remaining plan period.

Estimate Method	Million Tonnes per year	2022 (14 Years) (Million Tonnes)
Cambridgeshire & Peterborough Minerals and Waste Local Plan Provision (2.6 mtpa)	2.6	36.4
Rolling average of 3 Years Sales	3.113	43.582
Rolling average of 10 Years Sales	2.891	40.474

Landbanks

67. Estimated sand and gravel reserves in Cambridgeshire and Peterborough as of 31 December 2022 are 33.391 mt. This is based on reserve information provided by site operators in response to annual minerals surveys (where a nil return was made, a calculation of reserves was made using previous years information/planning application information). Tables 7 to 10 set out calculations for the sand and gravel landbanks based on the different apportionment rates for Cambridgeshire and Peterborough, using the 2022 permitted reserves total. A landbank based on 3 years rolling average is also included, given that there have been significant fluctuations (with sales ranging between 1.837 mtpa to 3.559 mtpa) over the 10-year period 2013

to 2022. In 2022 the 10 years sales average was 2.891mt and the three-year sales average was 3.113mt.

Table 7 Sand and gravel landbank calculations for Cambridgeshire and Peterborough, 2019 – 2022

Cambridgeshire and Peterborough	2019	2020	2021	2022
Sand and gravel sales estimate (mt)	3.42	2.82	3.48	3.035
Permitted reserves at 31 December (mt)	39.17	36.06	33.87	32.391

Note: Measure 1: East of England Sub-Regional Apportionment was depreciated on adoption of Minerals and Waste Local Plan 2021. This measure is no longer monitored LAA reports.

Table 8 Sand and gravel landbank calculations for Cambridgeshire and Peterborough, 2019 – 2022: Measure 2 - Core Strategy Provision

Year	2019	2020	2021	2022
Cambridgeshire & Peterborough Core Strategy Provision (mtpa)	3.0	3.0	2.6	2.6
Landbank based on Core Strategy Provision (Years)	13.06	12.02	13.02	12.46

Table 9 Sand and gravel landbank calculations for Cambridgeshire and Peterborough, 2019 – 2022: Measure 3 - 10-year sales average

Year	2019	2020	2021	2022
Rolling 10-year average timespan	2010-2019	2011-2020	2012-2021	2013-2022

Rolling average of 10 Years Sales	2.49	2.59	2.77	2.891
Landbank based on rolling 10 years sales average (Years)	15.73	13.90	12.22	11.20

Table 10 Sand and gravel landbank calculations for Cambridgeshire and Peterborough, 2019 – 2022: Measure 4 - three-year average

Year	2019	2020	2021	2022
Rolling 3 Year Average timespan	2017-2019	2018-2020	2019-2021	2020-2022
Rolling average of 3 Years Sales	3.39	3.15	3.24	3.113
Landbank based on rolling 3 years sales average (Years)	11.55	11.45	10.44	10.3

Future Supply

68. In addition to permitted reserves, the Plan makes allocations for the future supply of sand and gravel. The tables below summarise the allocations which have been made for which planning permission has not yet been granted; and the provision made when permitted and allocated reserves are considered together.

Table 11 Minerals and Waste Local Plan Allocations Permitted

Site ID	Site Name	Total Allocated Reserves (million tonnes)	Allocated Reserves Permitted	Allocated Reserves Remaining
M019	Bare Fen & West Fen, Willingham/Over	3.000	0	3.000

M021	Mitchell Hill Farm South, Cottenham	0.140	0	0.140
M022	Chear Fen, Cottenham	0.820	0	0.820
M028	Kings Delph, Whittlesey	0.350	0	0.350
M029	Gores Farm, Thorney	1.600	0	1.600
M033	Land off Main Road, Maxey	1.925	0	1.925
M034	Willow Hall Farm, Thorney	2.800	2.1	0.700 ⁶
M035	Block Fen/Langwood Fen East, Mepal	4.680	0.363	4.317
M036	Block Fen/Langwood Fen West, Mepal	2.308	0	2.308
	Totals	17.623	2.463	15.160

Table 12 Provision including permitted and allocated resources in 2022

	Minerals and Waste Local Plan Provision of 2.6 mtpa	Rolling average of 10 Years Sales (2013-2022) of 2.891 mtpa	Rolling average of 3 Years Sales (2012-2022) of 3.113 mtpa
Permitted Reserves	32.391mt	32.391mt	32.391mt
Allocated Reserves	15.160mt	15.160mt	15.160mt
Total Reserves	47.551mt	47.551mt	47.551mt
Number of years supply ⁷	19.0	16.4	15.3

⁶ 2.1mt was permitted under permission 21/00720/MMFUL - Permission to extract northern part of allocation. This was not included in total permitted reserve for 2021-2022 in the return supplied by the site operator. It is expected that this will appear in the 2023 figures.

⁷ Calculations exclude the 14.5 mt allocated for post 2036 at Block Fen / Langwood Fen, Mepal

Date current planned provision would be exhausted ⁷	2040	2038	2037
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Cambridgeshire and Peterborough Assessment of Local Limestone Supply and Demand 2022

Current Supply

69. Historically there used to be several limestone quarries in the Plan area. Some of these sites have since been closed and are in restoration, whilst the reserves of others are not viable. By the end of 2022 there were only three active limestone sites remaining, see Table 13 below.

Table 13 Permitted crushed rock quarries in Cambridgeshire & Peterborough 2022

Planning Authority	Site	Operator	Status
Cambridgeshire	Dimmock's Cote Quarry, Cambs	Francis Flower Ltd	Active
Peterborough	Cook's Hole, Peterborough	Augean	Active
Peterborough	Thornhaugh IIB, Peterborough	Bullimores	Active

70. Dimmock's Cote Quarry in Cambridgeshire has been included in this section, although in practice it produces a small amount of limestone for agricultural/asphalt use.
71. A stock of reserves with planning permission is known as the landbank. Government policy requires landbanks to be maintained for all primary aggregate minerals, with a recommended landbank period for limestone (crushed rock) to be at least 10 years.
72. The adopted Cambridgeshire and Peterborough Minerals and Waste Local Plan makes provision for 0.3 mtpa of limestone (crushed rock). This is unchanged from the Cambridgeshire and Peterborough Minerals and Waste Core Strategy.

Demand estimate over remaining plan period.

73. Based on the provision figure of 0.3mt, it is estimated in the next 15 years of the Plan that 4.5 million tonnes of limestone is required.
74. Based on the information above, it is likely that this is currently being met through imports.

Future Provision of Limestone

75. Sales of limestone for the ten-year period between 2002 and 2022 are shown in Figure 5 and in below. Owing to the small number of sites it has not been possible to release a figure for sales for 2022 at this time, but the figure is lower than the 2020 sales.

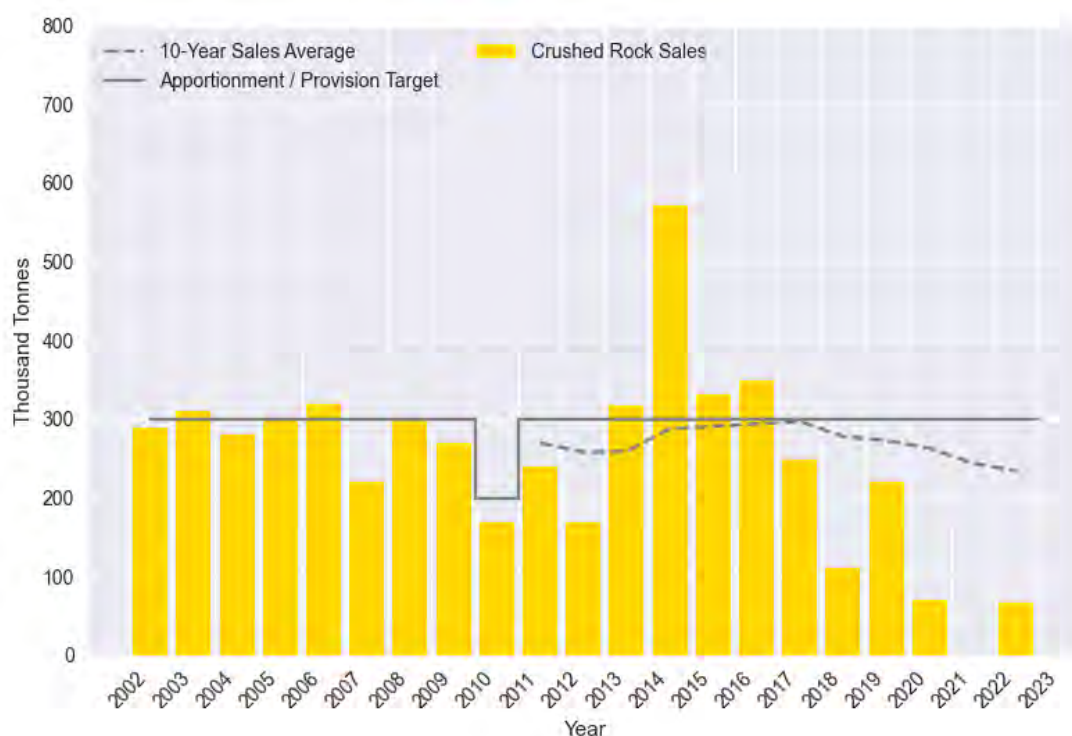


Figure 5 Sales of Crushed Rock (Limestone)

76. For reference, the apportionment provision target was / is set out in the following documents

- 2002-2009 – 0.3 million tonnes per annum based on revised national and regional guidelines for Aggregate Provision 2001-2016 published in 2003 and reflected in East of England Plan (May 2008)
- 2010 – 0.2 million tonnes per annum based on revised national and regional guidelines for Aggregate Provision 2005-2020 published in June 2009, and reflected in Draft East of England Plan 2031 (Feb 2010)
- 2011-2020 – 0.3 million tonnes per annum based on Cambridgeshire and Peterborough Minerals and Waste Core Strategy Development Plan Document (July 2011)

- 2021 Onwards – 0.3 million tonnes per annum based on provision identified in Cambridgeshire and Peterborough Minerals and Waste Local Plan (July 2021) (Current)

Table 14 Sales of Crushed Rock (Limestone)

Year	Sales (tonnes)
2012	169,000
2013	317,000
2014	572,000
2015	332,000
2016	350,000
2017	249,000
2018	111,000
2019	221,000
2020	70,000
2021	Confidential
2022	61,000

77. Through the 10 year period 2013 – 2022 the average sales of limestone was 0.234 mt.

Annual Provision

78. The limestone apportionment as set out in the Cambridgeshire and Peterborough Minerals and Waste Local Plan is 0.3 million tonnes per annum. The NPPF introduces sets out the current way of planning to ensure future need is met, based on the calculated rolling average of 10 years sales data, taking into account other relevant information.

Landbanks

79. Estimated limestone reserves in Cambridgeshire and Peterborough as of 31 December 2020, 2021, and 2022 are below. These figures are based on reserve information provided by site operators in response to the annual minerals surveys. Table 15 shows the calculations for the Limestone landbank based on the different apportionment rates for Cambridgeshire and Peterborough, using the permitted reserves.

Table 15 Landbanks for crushed rock (limestone) in Cambridgeshire & Peterborough in 2020 – 2022

Cambridgeshire and Peterborough	2020	2021	2022
Limestone sales (kt)	70	Confidential	66
Permitted reserves as at 31 December (mt)	3.16	2.94	2.870
Measure 2			
Cambridgeshire & Peterborough Minerals and Waste Local Plan Provision (mtpa)	0.3	0.3	0.3
Landbank based on Cambridgeshire & Peterborough Minerals and Waste Local Plan Provision (Years)	10.5	9.8	9.81
Measure 3			
Rolling average of 10 Years Sales (mtpa)	0.26	0.24	0.234
Landbank based on rolling 10 years sales average (Years)	12.2	12.1	12.3

80. Measure 1 has been discontinued. It measured against the East of England Plan apportionment, and this has been superseded by Measure 2.
81. In recent reporting years, the limestone landbank has been below the 10 years required by the NPPF. However, in 2019 workable reserves were identified by an operator as being deliverable in the plan period, which has brought the landbank just over the 10-year requirement. The adopted Minerals and Waste Local Plan (July 2021) concluded it was not possible to make new allocations for limestone therefore the current Plan has a criterion based policy against which any planning applications for a new limestone quarry would be considered.

Crushed Rock Imports

82. Cambridgeshire and Peterborough are dependent on imports of crushed rock to meet demand that cannot be met locally. Crushed rock is imported from outside the region, via rail heads in Peterborough, Cambridge, Ely, and March. Supplies are then distributed by road.

83. Quarries exporting crushed rock into Cambridgeshire and Peterborough have long term permitted reserves. There are no known constraints to the continued supply of crushed rock into the area provided operators are still able to access and operate at rail heads; the only other potential constraints would be large scale changes to the rail system or changes in the planning status of quarries, both of which are unlikely to happen.

Rail Depots

84. Cambridgeshire and Peterborough import hard rock through the rail depots in the area. These are at Cambridge, Ely, March, and Peterborough. An area of north-east Cambridge, in which the Cambridge Railhead is located, is currently the subject of a master planned redevelopment. The Railhead is safeguarded and should not be adversely affected by the redevelopment.

Assessment of Recycled and Secondary Aggregates 2022

85. Along with primary aggregates (minerals extracted directly from the ground), there are also secondary and recycled aggregates.
86. Recycled aggregates are those derived mainly from construction and demolition projects, for example brick and concrete being reprocessed to be used in new developments, rather than being disposed of in a landfill site.
87. Secondary aggregates are created as a by-product of a construction or industrial process, for example power station ash resulting from combustion (fly ash) which can be turned into bricks and cement.
88. The benefits for maximising the use of both secondary and recycled aggregate are two-fold. Firstly, the use of these aggregates reduces the need to extract primary material, leading to a reduction in the need for new quarries. Secondly, the re-use of aggregate reduces the amount of waste that needs to be disposed of, thereby reducing the need for landfill sites. Such a reduction in the need for quarry and landfill sites has clear economic, environmental, and social benefits.
89. Increasingly in Cambridgeshire and Peterborough recycled aggregate is being processed in conjunction with projects involving demolition, redevelopment and construction. This can involve stand-alone permanent facilities on industrial estates, or co-located facilities at waste management sites (landfill or other); or temporary inert recycling facilities located at strategic development areas (e.g. urban extensions), major demolition sites; or within existing quarries that remain operational until such a time that quarrying or landfilling ceases.

Current Supply

90. The Mineral Products Association estimates that of total aggregate supply in Great Britain in 2017, recycled aggregates (including railway ballast) accounted for 26% with secondary aggregates accounting for a further 3% (Mineral Products Association 2019 The contribution of recycled and secondary material to total aggregates supply in Great Britain).
91. In Cambridgeshire and Peterborough the following main sites, based on information from the Environment Agency's Waste Data Interrogator 2022, may have contributed to recycled / secondary aggregate production during 2022. These sites are listed in Table 16 below.

Table 16 Main Sites with Recycled and Secondary Aggregate Production Capacity in Cambridgeshire and Peterborough, 2022

Site Name	Operator
A11 Worsted Lodge, Cambs	Dockerill Groundworks Limited
Buckden Material Recycling Facility	Acorn Transport and Plant Hire Limited
Fengate Waste Treatment Facility	Mick George Limited
F C C Dogsthorpe, Peterborough	Construction & Environmental Services Limited
First Furlong Drove, Chatteris, Cambs	S R Harradine Haulage Limited
Little Paxton, Cambs	Eaton Tractors, Pitt Farm
St Ives Aggregates Facility, St. Ives, Cambs	Midland Quarry Products Limited
Mepal Soil And Aggregate Treatment Facility	Mick George Limited
National Track Materials Recycling Centre	Network Rail Infrastructure Limited
Plantation Farm	D Haird & Company Limited
Rose Plant Hire Transfer Station	Rose Aggregates Limited
Saxon Brickworks	Johnsons Aggregates and Recycling Limited
St Ives Transfer Station EPR/MP3139FY	Mick George Limited
Dawson Recycling Facility, Swavesey, Cambs	Mick George Limited

Unit 2 Vicarage Farm Road, Peterborough	Bourne Skip Hire and Recycling
Waterbeach, Cambs	AmeyCespa / Frimstone
White Walls, Coates, Cambs	P J Thory Limited

92. An extended version of this table that includes permit and grid references can be found in the Data Book that accompanies this document.
93. The data available on secondary and recycled aggregates is variable and not considered reliable, particularly at the sub-regional level. The most reliable source of data available to local authorities is that provided by the Environment Agency's (EA) Waste Data Interrogator database (WDI), which reports on waste operator returns but does not include operators carrying out exempt activities or where reuse and recycling is undertaken on site (e.g., mobile plant on redevelopment and construction projects). The EA WDI gives figures for the amounts of inert and construction and demolition wastes recorded as managed within the plan area. Data from the EA WDI should be treated with caution owing to issues with completeness and consistency (year to year), as well as the fact that sites take mixed waste streams and multiple operations at a site can include both transfer and treatment.
94. Figure 6 below shows that in 2022 (the latest available WDI data) sales of secondary and recycled aggregates in Cambridgeshire and Peterborough are estimated to have been approximately 0.46 Mt⁸ but this figure is likely to be an underestimate. Sales have fluctuated over the years, and this may add to the challenges in obtaining and determining accuracy of sales data.

⁸ The 460,770 tonnes estimate of secondary and recycled aggregate sales was calculated using the same method as previous Cambridgeshire and Peterborough Local Aggregate Assessments. The Waste Data Interrogator methodology as set out in the National Waste Technical Advisory Board Chairs and Aggregate Working Party Chairs' Guidance on Assessing Levels of Recycled Aggregates (May 2022) returns an estimate of 556,618 tonnes (including the 20% uplift).



Figure 6 Production of Recycled / Secondary Aggregates in Cambridgeshire & Peterborough

95. Projecting potential increases in sales of recycled aggregates is difficult as some of the known aggregates recycling facilities in the plan area are temporary and such facilities are typically replaced by other temporary facilities associated with construction projects and mineral extraction sites.
96. Recycled and secondary aggregates should be produced in accordance with nationally recognised protocols and be compliant with both British (BS) and European (EN) standards. It is not possible to state what proportion of this material has been produced and sold to a BS or EN standard, nor is it possible to clearly state how much is used as a direct substitute for primary sand and gravel or crushed rock resources.

Targets for Recycled and Secondary Aggregates

97. The former National and Regional Guidelines for Aggregates Provision in England (June 2003 and June 2009) specified that the East of England region should provide 117 million tonnes of alternative aggregate materials between 2005 and 2020, equating to 31% of the region's total aggregate supply. No sub-regional apportionments were derived from these figures. However, the Cambridgeshire and Peterborough Minerals and Waste Core Strategy (2011) did include the 31% target. As set out in previous Local Aggregate Assessments, this target was never met. The Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021), which

superseded the Core Strategy, does not include any targets related to recycled or secondary aggregate provision.

Road Planings

98. Historically the annual Aggregate Monitoring Survey, organised on behalf of the Ministry of Housing, Communities and Local Government (MHCLG), included questions regarding road planing production. This is no longer the case and this data is no longer being collected.

Conclusions

99. From the evidence set out in this assessment the Cambridgeshire and Peterborough Mineral Planning Authorities jointly conclude that the provisions set out in the Plans that were in place for 2022 and the newly adopted Cambridgeshire and Peterborough Minerals and Waste Local Plan make satisfactory provision for the steady and adequate supply of aggregates to meet the needs of the construction industry.
100. The National Planning Policy Framework decentralised the responsibility for providing a steady and adequate supply of aggregates to Mineral Planning Authorities (MPAs). To ensure supply meets strategic requirements each MPA is required to participate in an Aggregate Working Party; Cambridgeshire and Peterborough are members of the East of England Aggregate Working Park (EoEAWP). As members Cambridgeshire and Peterborough submit a draft copy of the Local Aggregates Assessment to the EoEAWP for comments. This process helps to ensure that each MPA is planning for adequate provision to meet local and national demands.

Sand and gravel

101. The Cambridgeshire and Peterborough Minerals and Waste Local Plan provision for 2.6 mtpa is below the 10-year sales average (but was in line with the 10 year sales average presented in the LAA 2021 for the year 2020 when the Plan was adopted). Applying the Local Plan provision rate, the sand and gravel landbank of permitted sites is 12.46 years; and applying the NPPF 10 year rolling average the landbank is 11.2 years. This is above the 7-year NPPF. There are also allocated sites in the Plan which have yet to come forward, which with estimated reserves of around 15.16 million tonnes, which provide a landbank of either 19 years under the Local Plan Rate or 16.4 years under a 10 year rolling average.

Limestone

102. The Minerals and Waste Local Plan provision rate of 0.3 mtpa is above the 10-year sales average. Applying the Minerals and Waste Local Plan provision rate, in 2022,

the limestone landbank duration is 9.8 years. However, the Plan acknowledges that it is dependent upon additional acceptable reserves coming forward over the plan period. The sales figure for 2022 is confidential owing to the small number of sites but is significantly below the provision rate. This figure includes limestone for non-aggregate purposes so in reality the landbank is below the NPPF requirement. In the event that proposals come forward they will be considered against adopted policies. However, it is recognised that the geographical extent of limestone is very limited, and it has also not proved possible to identify any further sites through the preparation processes of a Minerals and Waste Local Plan.

103. In national terms, Cambridgeshire and Peterborough contribute less than 1% of the nation's crushed rock supply. However, at the regional level the supply is significant, as the source of crushed rock is geologically limited to two relatively small locations i.e. north Norfolk and northwest of Peterborough. The MPAs jointly recognise that the relatively poor quality of the limestone limits it to low grade specification uses.

Recycled and Secondary Aggregates

104. In 2022 it is estimated that approximately 0.46 Mt of recycled aggregate was produced. There is no clear trend in relation to recycled aggregate production at this time. It continues to be nationally recognised that there are data quality issues concerned with secondary and recycled aggregates supply, sales, uses and definitions relating to quality standards.

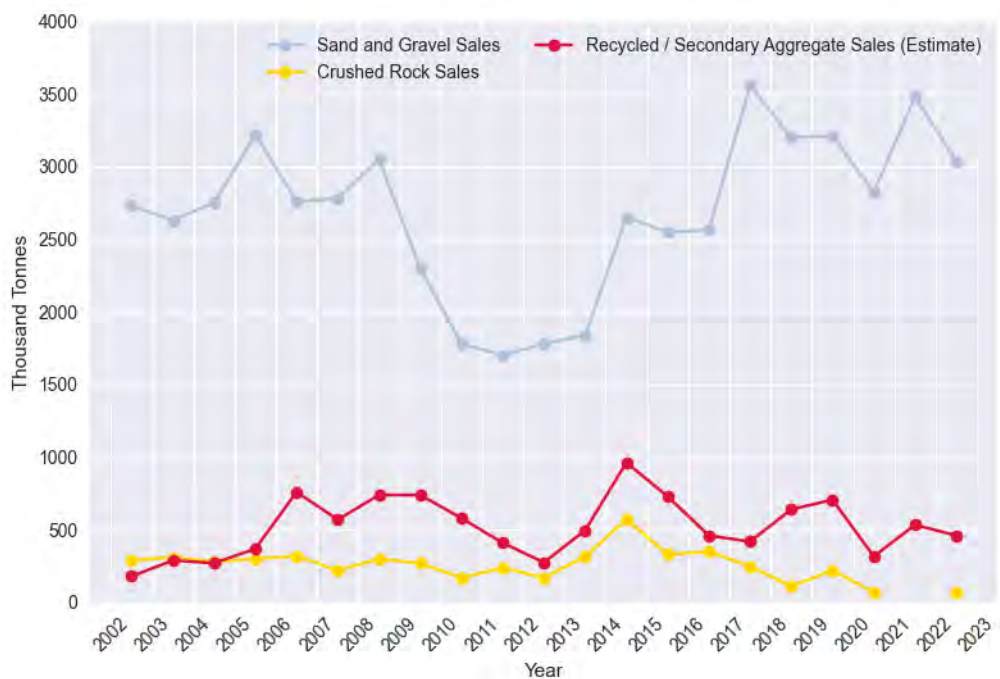


Figure 7 Summary of all aggregates in Cambridgeshire and Peterborough from 2012 to 2022⁹

Minerals and Waste Local Plan Preparation

105. The Cambridgeshire and Peterborough Minerals and Waste Local Plan was adopted in July 2021. Planning Authorities are required to regularly monitor Local Plans and review them every five years. The Review of the Plan is anticipated to commence during 2026. The Council’s Minerals and Waste Development Scheme will be updated in due course to set out the timetable of the Review.

⁹ Sales of Limestone (Crushed Rock) for 2022 are confidential.

Appendix A: Key figures

Value	Last Year	This Year
LAA Publication Year	2022	2023
LAA Survey Year	2021	2022
LAA Previous Survey Year	2020	2021
LAA Survey Year minus 3 years	2018	2019
LAA Survey Year minus 10 years	2012	2013

Sand and Gravel

Value	Last Year	This Year
Land-won sand & gravel sales (kt)	3,482	3,035
All sand & gravel sales (kt)	3,482	3,035
All sand & gravel sales 10-year average (kt)	2,745	2,891
All sand & gravel sales 3-year average (kt)	3,155	3,113
Permitted reserves of sand and gravel (kt)	33,865	32,391
Number of Allocated Sites	9	9
Potential remaining yield (kt) from allocated sites	17,620	15,160
Sand and Gravel LAA Rate (kt)	2,600	2,600
Sand and Gravel LAA Rate Source	Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)	Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)
Sand and Gravel Annual land-won production as percentage of apportionment figure	134%	117%
Sand and Gravel Landbank based on 10 years sales average (years)	12.22	11.0
Sand and Gravel Landbank based on 3 years sales average (years)	10.44	10.3
Sand and Gravel Landbank based on Local Plan provision figures (years)	13.02	12.46
Sand and Gravel Landbank based on LAA Rate (years)	13.02	12.46

Crushed Rock

Value	Last Year	This Year
Crushed Rock sales (kt)	Confidential	66
Crushed Rock sales 10-year average (kt)	243	234
Crushed Rock sales 3-year average (kt)	133	61
Crushed Rock permitted reserves.	2.941	2.870
Crushed Rock Number of Allocated Sites	0	0
Crushed Rock Potential remaining yield (Mt) from allocated sites	0	0
Crushed Rock LAA Rate (Mt)	0.3	0.3
Crushed Rock LAA Rate Source	Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)	Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)
Crushed Rock Landbank based on 10 years sales average (years)	12.1	12.3
Crushed Rock Landbank based on 3 years sales average (years)	26.0	46.7
Crushed Rock Landbank based on Local Plan provision figures (years)	9.81	9.81
Crushed Rock Landbank based on LAA Rate (years)	9.81	9.81

Recycled/Secondary Aggregates

Value	Last Year	This Year
Recycled/Secondary Aggregates sales (kt)	534	461
Recycled/Secondary Aggregates sales 10-year average (kt)	554	573
Recycled/Secondary Aggregates sales 3-year average (kt)	519	437
Recycled/Secondary Aggregates LAA Rate (kt)	None	None

Appendix B: Applications Approved, Refused, Withdrawn and Undetermined

The list below highlights the key applications that affect extraction quantities and schedules / restoration; there may have been other smaller applications, variations of conditions, and non-material amendments of a minor nature, but they have not been included in the list.

Site	Application	Decision	Tonnage	Allocation related?
Kennett Quarry / Landfill (Sand and Gravel) [X:568960, Y:268703]	CCC/21/265/VAR - Excavation of sand and gravel; reinstatement by importation of inert waste to agriculture and nature conservation after use; use of crusher and screen to process inert waste; and composting green waste to form restoration material. Informative: Section 73 @ Kennett Hall Farm Quarry, Turnpike Road, Kennett, CB8 7QX	Approve (31/10/22)	0	Existing site. No expansion.
Mepal Reservoir (a.k.a. Sutton Gault) (Sand and Gravel) [X:540471, Y:281677]	CCC/21/129/FUL - Use of existing mineral processing area and plant for proposed new eastern reservoir development (planning application ref. CCC/20/052/FUL). @ Mepal Reservoir, Land Off Blaby's Drove, Sutton Gault, Ely, Cambs, CB6 2BE	Approve (28/07/22)	0	Not within allocated site.
Coopers Farm (Sand and Gravel) [X:545062, Y:285192]	CCC/21/121/FUL - Creation of two irrigation reservoirs by the extraction and export of sand and gravel and the extraction of clay; infilling a redundant irrigation reservoir with imported inert material. @ Coopers Farm, Land 500 Metres Southeast Of Langwood Fen Farm, Langwood Fen Drove, Chatteris, Cambridgeshire, PE16 6XF	Approve (08/06/22)	363kt	363-395kt depending on source Land take 10 ha of 382ha.
Saxon Pit / Saxon Brickworks (Recycled)	CCC/21/024/FUL - Importation, storage, processing including use of trommel, picking and recycling of incinerator bottom ash (IBA) and construction and demolition (C&D) waste, for exportation for use as	Approve (22/04/22)	0	Existing site. No expansion.

Aggregate) [X:525444, Y:297162]	incinerator bottom ash secondary aggregates (IBAA). @ Former Saxon Brickworks, Off Peterborough Road, Whittlesey, Cambridgeshire, PE7 1PD			
Mepal Reservoir (a.k.a. Sutton Gault) (Sand and Gravel) [X:540471, Y:281677]	CCC/20/052/FUL - Construction of irrigation reservoirs by the extraction and export of sand and gravel; silt lagoons; mineral processing plant; weighbridge; temporary buildings and use of existing access onto the A142 Chatteris Road between the Mepal Outdoor Centre and H @ Mepal Reservoir, Land Off Blaby's Drove, Sutton Gault, Ely, Cambs, CB6 2BE	Approve (28/07/22)	720kt	Not within allocated site.
Bridge Farm (Sand and Gravel) [X:539714, Y:276703]	CCC/22/091/FUL - Extension of irrigation reservoirs (part retrospective) and construction of a third reservoir by the extraction, processing and export of sand and gravel; excavation of clay for sealing the reservoir embankments; silt settlement lagoons; and temporary infrastructure with access onto the B1050 Chatteris Road between Ashwood and Holwood Nurseries. @ Land At Bridge Farm, Holme Fen, Drove Colne, PE28 5EE	Pending	796kt	Not Allocated
Queen Adelaide Way, Ely (Secondary Aggregate / Recycled Aggregate) [X:555871, Y:280853]	CCC/22/108/FUL - Removal of aggregate storage bays and existing coated stone plant, installation of replacement coated stone plant, erection of dry aggregate bays, weighbridge, the continued storage and distribution of aggregates, associated works and facilities, and biodiversity enhancements. @ Tillicoultry Quarries Ltd Coated Stone Plant, Queen Adelaide Way, Ely, Cambridgeshire, CB7 4UB	Pending	0	Existing Site.

Appendix C: Correlation between housing completions and sand and gravel sales for the area of Cambridgeshire and Peterborough, (an exploration).

A criticism of the Cambridgeshire and Peterborough Local Aggregates Assessment 2022 was that it did not include future forecasting of likely aggregate requirements. The Councils have sought to at least, partially address this in the 2023 Local Aggregates Assessment, by projecting future likely demand based on housing commitments. The purpose of this is to provide a reasonable estimate of whether provision within the Cambridgeshire and Peterborough Minerals and Waste Local Plan reflects actual provision being made.

To forecast the future likely sales, some form of information is required as to the likely demand for sand and gravel. Whilst there are many ways of doing this, for this initial attempt it was decided to focus on the relationship between housing completions and sand and gravel sales. The reasons for this are:

1. There is a common belief that there is a direct relationship between housing completions and aggregate sales. This would appear to be reasonable, given aggregate is required for construction, and housing forms one of the major sectors of construction activity.
2. Housing completion data is relatively easy to source and is regularly monitored by Local Planning Authorities.
3. Alongside completions Local Planning Authorities publish 5-year housing land supply report, which document commitments that are expected to be constructed in the next five years.

For this method to be considered reliable, this raises two questions to answer:

1. Is there a relationship between the sand and gravel sales and housing completions in Cambridgeshire and Peterborough, and if so, to what extent does this relationship exist?
2. What is the relationship between housing commitments and completions?

Of these two questions, from the data at hand, there is sufficient to answer the first, but the second question will have to be addressed in the future.

Data Sources

Housing completions for Peterborough have been sourced from:

- Peterborough Annual Monitoring Report 2009 (Provided by Peterborough City Council on request)
- [Peterborough Annual Monitoring Report 2016](#)

- [Peterborough City Council Five Year Land Supply 1 April 2022 to 31 March 2027 \(Page 4\)](#)

Housing Completion Data for Cambridgeshire was sourced from:

- Data Table: [Cambridgeshire Insights, Table H1.1 Dwelling Completions in Cambridgeshire 2002-2021 - Cambridgeshire](#)
- Further information: <https://cambridgeshireinsight.org.uk/planning/monitoring-housing-business-and-renewable-energy-development/>

Sand and Gravel Sales:

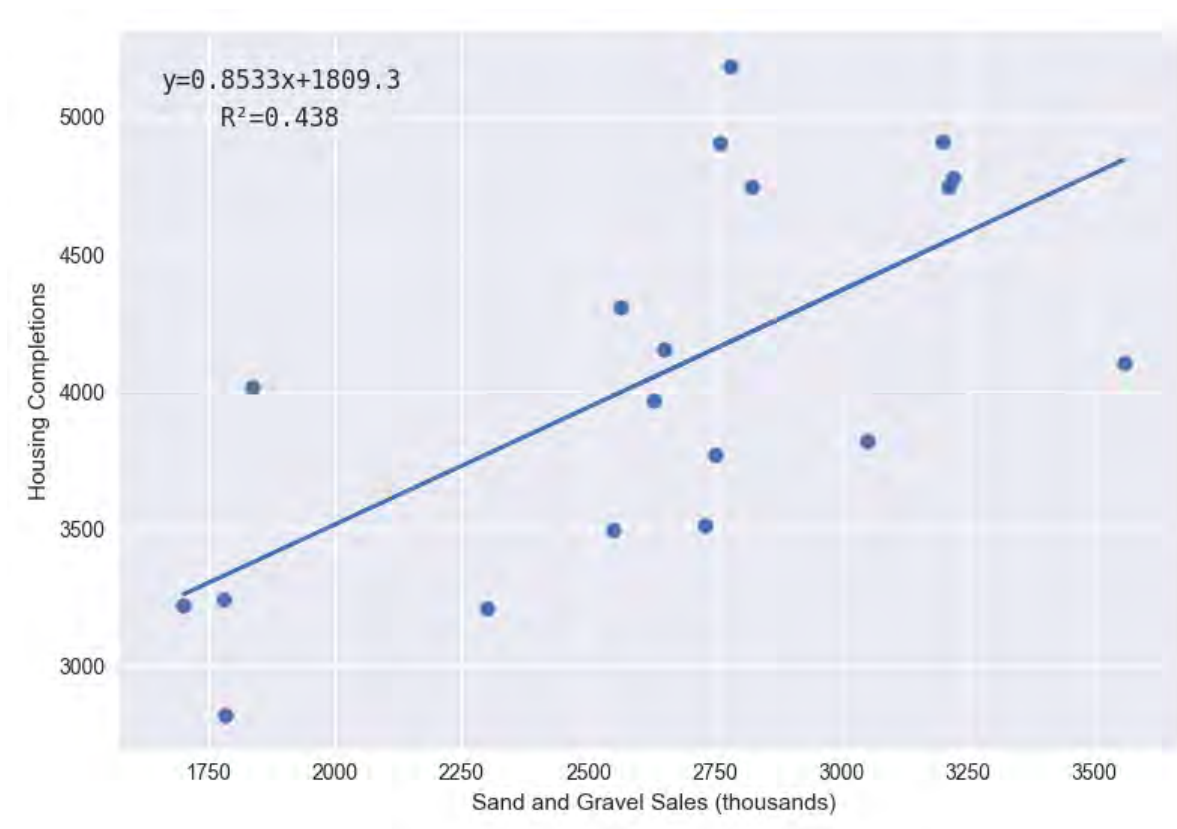
- [Cambridgeshire and Peterborough Local Aggregates Assessments](#) (Various)

Tables of the collected data can be found at the end of this document.

Exploration

The chart below shows a scatter graph of housing completions plotted against sand and gravel sales. As can be seen from this chart there is some correlation ($R^2 = 0.438$), but the data is noisy.

Figure 8 Sand and Gravel Sales (2002 - 2020) & Housing Completions (2002/03 - 2020/21)



There are several potential reasons why this noise may exist, these could include:

- Inaccurate reporting in either the completion or aggregate surveys on which the data is based.
- There is an offset between the reporting years (minerals uses calendar, completions use the financial year)
- The use of aggregates in construction does not necessarily mean that that building was reported as a completion in that year and may have been reported in subsequent years.

One method that may address these issues is to use a roaming mean (average), e.g., a three-year or five-year average for any given year. To give a more accurate mean, a mid / centre point average was chosen to the completion and sales data, rather than a lookback average. This has been selected over the lookback as it addresses the following issues that the lookback would not:

- a) It will not be offset from the year the data is representing; and
- b) It will account for completions being reported in future years.

The trade-off is that it will underestimate the peaks and troughs for any given year, and that the averages for first and last one or two years in the data cannot be calculated. However, for planning purposes, this trade-off is, in most situations, acceptable.

Figure 9 Example of a roaming three-year mid / centre point mean (average)

$$[0, 1, 2, 3, 4, 8] \Rightarrow [Null, 1, 2, 3, 5, Null]$$

For this exploration, three-year and five-year mid averages were tried. Seven years is getting close to the 10-year lookback average which is the starting point for aggregate provision when preparing minerals and waste local plans, and unlikely to provide timely data for forecasting.

Figure 10 3-Year Mid Mean (Average) Sand and Gravel Sales (2003 - 2019) & Housing Completions (2003/4 - 2019/20)

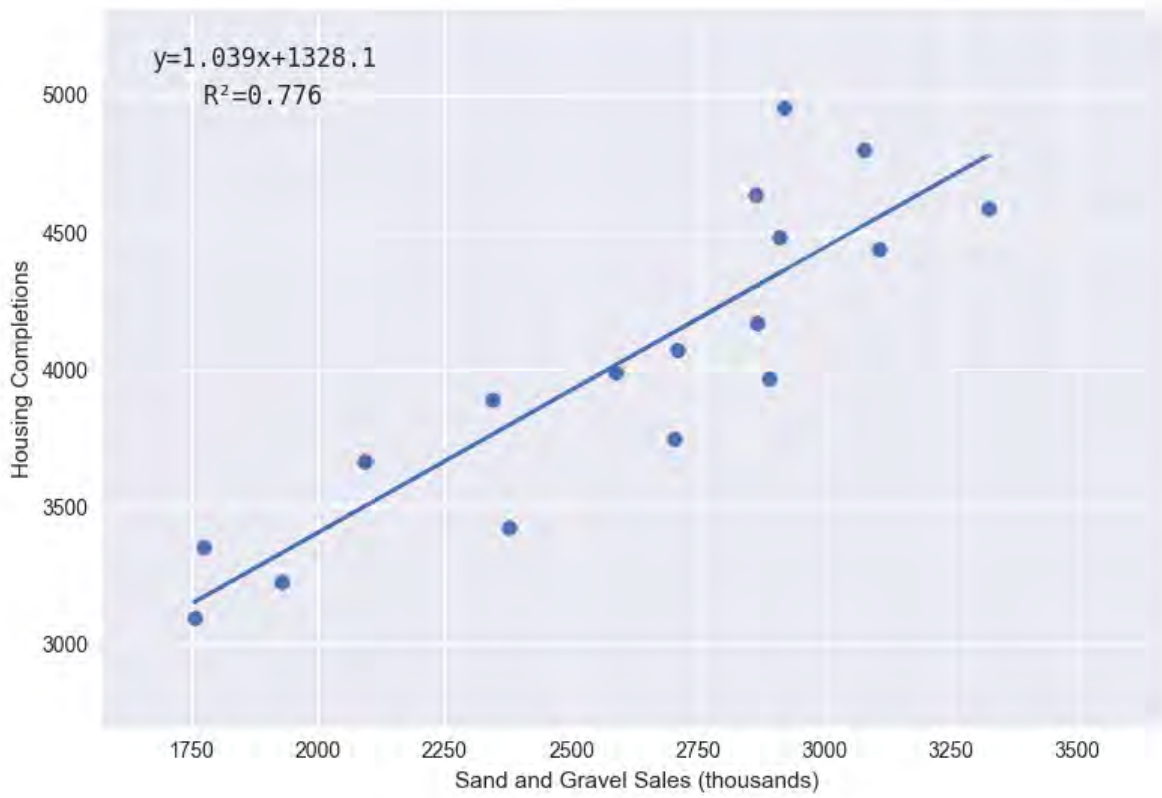
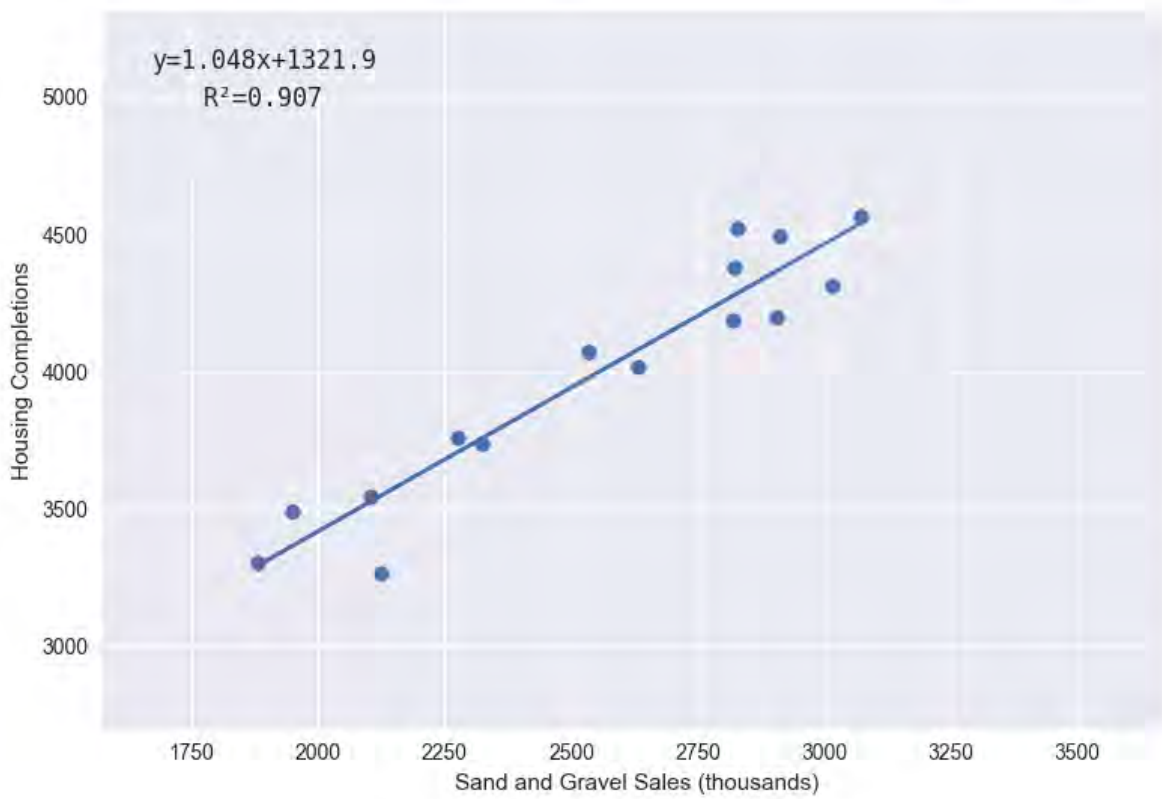


Figure 11 5-Year Mid Mean (Average) Sand and Gravel Sales (2004 - 2018) & Housing Completions (2004/5 - 2018/19)



Correlation

The correlation coefficient (R^2) increases from 0.438 with a year-on-year comparison, to 0.778 with a three-year mid mean (average), before reaching 0.907 with a five-year mid mean (average). A coefficient value of 0.907 indicates that there appears to be a strong correlation between the 5-year (mid) average of housing completions and sand and gravel sales.

Line of Best Fit

A linear line of best fit was calculated for each of the three charts. The three-year and five-year returned were quite similar, and as the five-year mid mean returned the best correlation, it will be that which is focused on:

$$y = 1.048x + 1321.9$$

In this instance, y is the number of housing completions and x is the sales of sand and gravel. The inverse of this is:

$$x = 0.8653y - 904.04$$

Whilst this line appears a good fit, it has some limitations. It was expected that the line of best fit would show a baseload of sand and gravel being used for other uses, and a proportional amount on top of that required for housing; but this does not appear to be the case. If it is followed to its lower limit, in theory, 904 dwellings could be built without the sale of sand and gravel, which would seem implausible. There could be one or several possible explanations these could include:

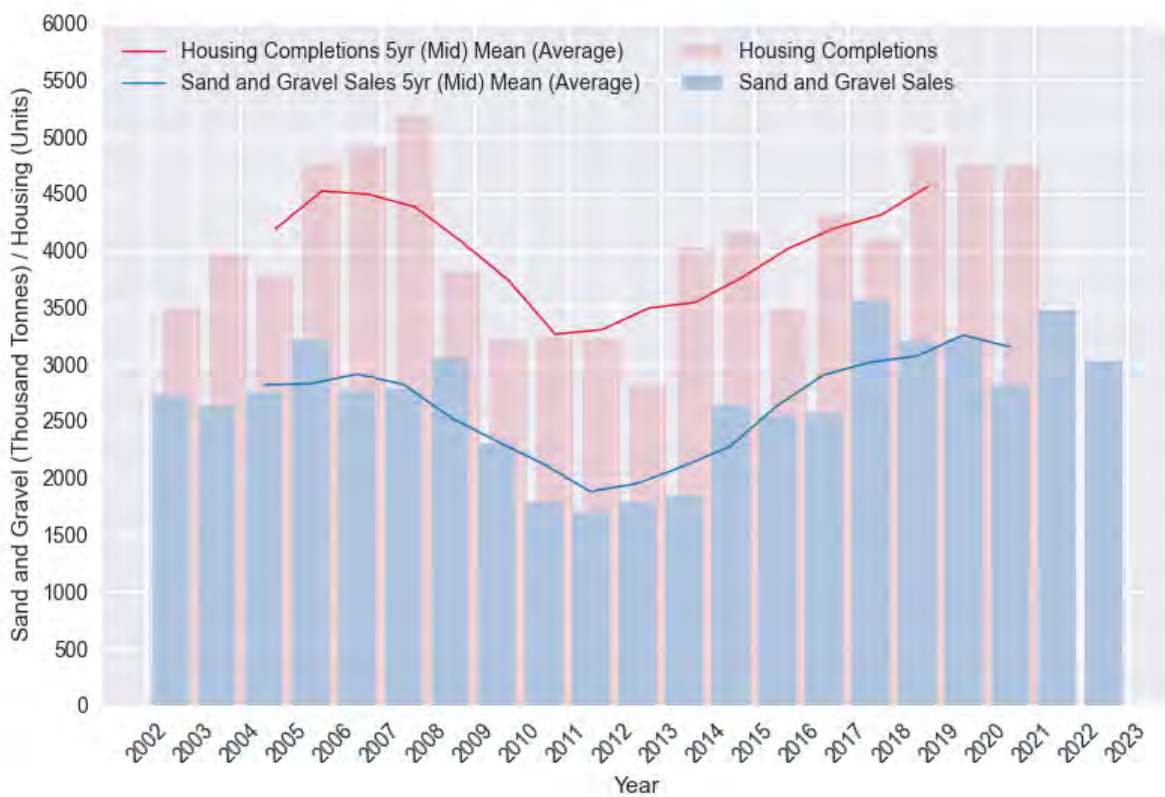
- The line may vary depending on the local circumstances of the study area.
- The line of best fit is not linear and is a curve of some kind, but there are insufficient datapoints for this to be visible.
- Housing and associated infrastructure uses more sand and gravel than is sold in the monitoring area and there are significant imports.
- Completions includes conversions which may not require as much aggregate than constructing a home or apartment complex.
- Construction in certain areas may require less infrastructure than others depending on the existing infrastructure, i.e., there is a 'baseload' of infrastructure being used.
- Economies of scale, if more dwellings are built, they may use proportionally less aggregate per dwelling as they occupy a smaller area or use more efficient construction techniques, e.g., a block of flats compared with the same number of dwellings as houses.

That said, the strong correlation, does imply that this line is reasonable between the upper and lower known values of historic competitions, but outside those limits the relationship is uncertain.

Summary

Of the datasets tested the five-year mid mean (average) method appears to produce the most reliable relationship between sand and gravel sales and housing completions, with a correlation coefficient of 0.907. The chart below illustrates the five-year mid mean (average) data against actual sales and completions. As can be seen in the chart, the two lines appear to match each other reasonably well.

Figure 12 Housing Completions and Sand and Gravel Sales (2002-2022)



Notes, Caveats & Assumptions

This is data based on Cambridgeshire and Peterborough only. It has not been tested on other areas, and it is not known if this relationship holds in other areas where circumstances may be different.

This does not account for imports / exports. It could be that sand and gravel sold in Cambridgeshire and Peterborough is only used in that area, but equally it could also be nearby areas which are being sold to are also building dwellings at a comparable rate to those recorded in the within Cambridgeshire and Peterborough.

Housing competition includes all form of dwelling completions, normally adjusted by losses.

Future work

The scope of this exploration is quite limited, but it has led to several potential areas of future work that could be undertaken in the future by anyone interested in the subject. These include:

- Establishing the relationship between housing commitments and completions.
- An exploration of lookback, centre / mid-point and lookahead mean averages.
- Comparison with other areas to see if the similar results are returned or if the line of best fit changes significantly depending on the area.
- Explore whether upper tier authority areas are an appropriate geography, or if functional aggregate sales areas could be established for different aggregates. One approach could be to explore the use of gravity models.

Appendix C1: Data Table

sand and gravel monitoring year	sand and gravel sales (thousands)	housing completions monitoring year	housing completions (units)	housing completions 3yr mid mean	housing completions 5yr mid mean	sand and gravel sales 3yr mid mean	sand and gravel sales 5yr mid mean
2002	2730	2002/03	3511				
2003	2630	2003/04	3969	3749.667		2703.333	
2004	2750	2004/05	3769	4172	4187	2866.667	2818
2005	3220	2005/06	4778	4485	4522.4	2910	2828
2006	2760	2006/07	4908	4958	4492.8	2920	2912
2007	2780	2007/08	5188	4639	4381.4	2863.333	2822
2008	3050	2008/09	3821	4073.667	4074	2710	2534
2009	2300	2009/10	3212	3424.667	3737	2376.667	2322
2010	1780	2010/11	3241	3225.333	3263.4	1926.667	2122.6
2011	1700	2011/12	3223	3094.667	3303	1754.333	1880
2012	1783	2012/13	2820	3354	3492	1773.333	1950
2013	1837	2013/14	4019	3665.333	3543.4	2090	2103.6
2014	2650	2014/15	4157	3891.333	3760.2	2345	2276.6
2005	2548	2015/16	3498	3987.333	4017	2587.667	2631.8
2016	2565	2016/17	4307	3969.667	4195.6	2890.667	2904.2

2017	3559	2017/18	4104	4441	4314	3107.667	3016.4
2018	3199	2018/19	4912	4588.333	4564.2	3323	3071.4
2019	3211	2019/20	4749	4803.333		3077.667	3254.8
2020	2823	2020/21	4749			3172	3150
2021	3482	2021/22				3113.333	
2022	3035	2022/23					

Appendix C2: SG_Housing_Correlation.py (python script for calculations & charts)

```
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
import scipy
import scipy.stats
from numpy import NaN

## USER VARIABLES - ENTER HERE

# Data for Cambridgeshire and Peterborough
#
# The Annual Monitoring Survey is monitored on a calendar year basis, whilst
# the Housing Completions are surveyed on a financial year.
#
# Sand and Gravel Sales is measured in thousands of tonnes (1,000t)
# Housing Completions is measured in units, i.e., 1 unit.

# This assumes you have an equal number of years for sales and completions.

data = {

    # SG Data is collected on calendar basis year, the 0.5 ensures that the
    # bars are displayed in a midyear position.

    'sand and gravel monitoring year': [
        2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009,
        2010, 2011, 2012, 2013, 2014, 2005, 2016, 2017,
        2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025,
        2026, 2027],

    'sand and gravel year': [
        2002.5, 2003.5, 2004.5, 2005.5, 2006.5, 2007.5, 2008.5, 2009.5,
        2010.5, 2011.5, 2012.5, 2013.5, 2014.5, 2015.5, 2016.5, 2017.5,
        2018.5, 2019.5, 2020.5, 2021.5, 2022.5, 2023.5, 2024.5, 2025.5,
        2026.5, 2027.5],

    'sand and gravel sales': [
        2730, 2630, 2750, 3220, 2760, 2780, 3050, 2300,
        1780, 1700, 1783, 1837, 2650, 2548, 2565, 3559,
        3199, 3211, 2823, 3482, 3035, NaN, NaN, NaN,
        NaN, NaN],

    # Note, the .75 puts its halfway through the financial year.
```

```
'housing completions monitoring year': [
    "2002/03", "2003/04", "2004/05", "2005/06", "2006/07", "2007/08",
    "2008/09", "2009/10", "2010/11", "2011/12", "2012/13", "2013/14",
    "2014/15", "2015/16", "2016/17", "2017/18", "2018/19", "2019/20",
    "2020/21", "2021/22", "2022/23", "2023/24", "2024/25", "2025/26",
    "2026/27", "2027/28"],

'housing completions year': [
    2002.75, 2003.75, 2004.75, 2005.75, 2006.75, 2007.75, 2008.75,
    2009.75, 2010.75, 2011.75, 2012.75, 2013.75, 2014.75, 2015.75,
    2016.75, 2017.75, 2018.75, 2019.75, 2020.75, 2021.75, 2022.75,
    2023.75, 2024.75, 2025.75, 2026.75, 2027.75],
'housing completions': [
    3511,    3969,    3769,    4778,    4908,    5188,    3821,
    3212,    3241,    3223,    2820,    4019,    4157,    3498,
    4307,    4104,    4912,    4749,    4749,    NaN,    NaN,
    NaN,    NaN,    NaN,    NaN,    NaN],

}

# Number of years to display in chart 4.

etx = 22

## AUTOMATIC CALCULATIONS

# NaN Values are not allowed for calculating Trend lines and regression.
# This assumes there are NaN at the end the sand and gravel sales list and
# counts all not NaN values.

min_entries = min(
    [sum(~np.isnan(data['sand and gravel sales'])),
     sum(~np.isnan(data['housing completions'])])
)

print(min_entries)
d_start, d_end = 0, min_entries

# Min and Max for axis

x_min = ((int(min(data['sand and gravel sales'])))/500)-0.25)*500
x_max = ((int(max(data['sand and gravel sales'])))/500)+0.25)*500
y_min = ((int(min(data['housing completions'])))/500)-0.25)*500
y_max = ((int(max(data['housing completions'])))/500)+0.25)*500

# Calculate 3 and 5 year rolling average

data['housing completions 3yr mid mean'] = pd.DataFrame(
    {'housing completions': data['housing completions']}
).rolling(3, center=True).mean().values.flatten()

data['housing completions 5yr mid mean'] = pd.DataFrame(
    {'housing completions': data['housing completions']}
).rolling(5, center=True).mean().values.flatten()

data['sand and gravel sales 3yr mid mean'] = pd.DataFrame(
```

```
        {'sand and gravel sales': data['sand and gravel sales']}]
    ).rolling(3, center=True).mean().values.flatten()

data['sand and gravel sales 5yr mid mean'] = pd.DataFrame(
    {'sand and gravel sales': data['sand and gravel sales']}]
    ).rolling(5, center=True).mean().values.flatten()

# CHART A: CORRELATION CHARTS

# Draw Charts
def draw_chart(filename, x, y, d_start, d_end):

    plt.style.use('seaborn')

    fig, ax = plt.subplots()
    fig.set_tight_layout(True)

    ax.set_xlim(x_min, x_max)
    ax.set_ylim(y_min, y_max)

    # Plot Scatter
    ax.scatter(x, y)

    # Add Trend Line
    slope, intercept, r_value, p_value, std_err = scipy.stats.linregress(
        np.array(x[d_start:d_end]),
        np.array(y[d_start:d_end])
    )

    ax.plot(
        x[d_start:d_end],
        slope*np.array(x)[d_start:d_end] + intercept)

    ax.set_xlabel('Sand and Gravel Sales (thousands)')
    ax.set_ylabel('Housing Completions')

    print(filename, slope, intercept, r_value)

    textstr = '\n'.join((
        f'y={slope:.4}x{intercept:+.5}',
        f'R2={pow(r_value,2):.3}'
    ))

    ax.text(0.15, 0.95, textstr, transform=ax.transAxes, fontsize=12,
            verticalalignment='top',
            linespacing=1.5,
            fontfamily='monospace',
            #bbox=props
            horizontalalignment='center'
    )

    plt.savefig(filename)

# Charts to produce
```

```
draw_chart(
    "SG_Housing_Correlation_F01.png",
    data['sand and gravel sales'],
    data['housing completions'],
    d_start, d_end)

draw_chart(
    "SG_Housing_Correlation_F02.png",
    data['sand and gravel sales 3yr mid mean'],
    data['housing completions 3yr mid mean'],
    d_start+1, d_end-1)

draw_chart(
    "SG_Housing_Correlation_F03.png",
    data['sand and gravel sales 5yr mid mean'],
    data['housing completions 5yr mid mean'],
    d_start+2, d_end-2)

draw_chart(
    "SG_Housing_Correlation_F03_INVESE.png",
    data['housing completions 5yr mid mean'],
    data['sand and gravel sales 5yr mid mean'],
    d_start+2, d_end-2)

# CHART B: COMPOSITE CHART

def draw_chart_b(
    filename,
    sand_and_gravel_year,
    sand_and_gravel_sales,
    sand_and_gravel_sales_5yr_mid_mean,
    housing_completions_year,
    housing_completions,
    housing_completions_5yr_mid_mean,
    etd=0, etx=200, y_max=5000):

    plt.style.use('seaborn')
    fig, ax = plt.subplots()

    fig.set_tight_layout(True)

    # Sales & Completion Bars in background

    ax.bar(housing_completions_year[etd:etx], housing_completions[etd:etx],
           color="tab:red", alpha=0.15,
           label="Housing Completions",)

    # Overlay SG Sales

    ax.bar(
        sand_and_gravel_year[etd:etx], sand_and_gravel_sales[etd:etx],
        color="lightsteelblue", alpha=1,
        label="Sand and Gravel Sales")
```

```
# 5 yr mid average

ax.plot(
    housing_completions_year[etd:etx], housing_completions_5yr_mid_mean[etd:etx],
    '-', linewidth=1, color="tab:red",
    label="Housing Completions 5yr (Mid) Mean (Average)",
)

ax.plot(
    sand_and_gravel_year[etd:etx], sand_and_gravel_sales_5yr_mid_mean[etd:etx],
    '-', linewidth=1, color="tab:blue",
    label="Sand and Gravel Sales 5yr (Mid) Mean (Average)",
)

# Levels and Limites
ax.set_ylabel('Sand and Gravel (Thousand Tonnes) / Housing (Units)')
ax.set_xlabel('Year')

ax.set_ylim(0, y_max)

plt.xticks(ticks=[int(x) for x in sand_and_gravel_year[etd:etx]], rotation=45)
plt.yticks(ticks=range(0,y_max+1, 500))

ax.legend(ncol=2)
plt.savefig(filename)

print("SG_Housing_Correlation_F04.png")

draw_chart_b(
    "SG_Housing_Correlation_F04.png",
    data['sand and gravel year'],
    data['sand and gravel sales'],
    data['sand and gravel sales 5yr mid mean'],
    data['housing completions year'],
    data['housing completions'],
    data['housing completions 5yr mid mean'],
    etd=0, etx=etx, y_max=6000)

print("SG_Housing_Correlation_Data.csv")

pd.DataFrame(data).to_csv("SG_Housing_Correlation_Data.csv")
```