1st Devon Local Aggregate Assessment

February 2013

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Cover photographs (© Devon County Council unless stated otherwise)

Top left: Processing of china clay waste for secondary aggregates, Lee Moor

Top right: Sand and gravel from the Budleigh Salterton Pebble Beds, Rockbeare Hill Quarry

Bottom left: Processing of construction and demolition waste for recycled aggregates, Trood Lane, Exeter

Bottom right: Working of limestone at Linhay Hill Quarry, Ashburton (© Dartmoor National Park Authority)

Acknowledgements

The assistance of Devon's mineral operators in providing the necessary data for the preparation of the Local Aggregate Assessment is gratefully acknowledged, as is the input of other stakeholders including other mineral planning authorities and interest groups.

Further Information

This Local Aggregate Assessment has been prepared by Devon County Council on behalf of the five Devon mineral planning authorities, and is based on aggregates data for the period to 31 December 2011.

To discuss the Local Aggregate Assessment further, please contact Andy Hill of Devon County Council on 01392 383510 or by email minerals@devon.gov.uk

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EXECUTIVE SUMMARY

Devon's diverse geology results in a wide range of land-won aggregate resources being available. Waste materials from the quarrying of china clay, ball clay and slate produce secondary aggregates that, together with processing of construction, demolition and excavation waste for recycled aggregates, provide alternatives to the use of land-won aggregates. Sales of the different types of aggregates (estimated in the case of recycled aggregates) over the last ten years are illustrated below.

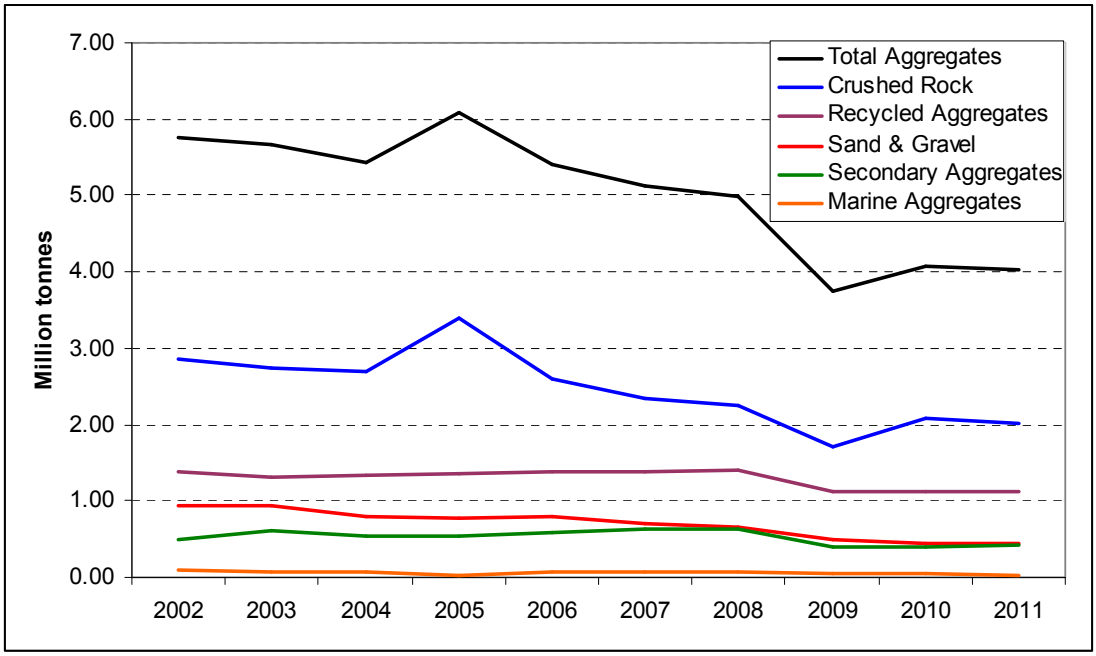


Figure ES.1: Total sales of aggregates in Devon, 2002-2011

These sales figures provide weighted ten year averages of:

Land-won crushed rock	2.28 million tonnes
Land-won sand and gravel	0.61 million tonnes
Recycled aggregates	1.25 million tonnes
Secondary aggregates	0.50 million tonnes
Marine aggregates	0.05 million tonnes

While the landbank for land-won crushed rock, at 64 years, extends well beyond the timescales of Devon's Minerals/Local Plans, land-won sand and gravel has a landbank of 15 years which indicates that Devon County Council may have to make additional provision if a minimum landbank of seven years is to be maintained for its Plan period to 2031.

There has been a trend over the past ten years towards the substitution of land-won aggregates by alternative aggregates, and evidence indicates that Devon has the capacity to support increased production of secondary and recycled aggregates.

In 2009, 87% of land-won and secondary aggregates produced in Devon were sold to destinations within the county, with most of the remainder going to adjacent counties. Significant imports of crushed rock took place from quarries in adjacent counties and to provide high-specification aggregates currently unavailable in Devon. Only small quantities of aggregates produced or consumed within Devon were transported by rail or sea.

1. INTRODUCTION

1.1 The National Planning Policy Framework [NPPF] [DCLG (2012a)] introduced new arrangements for managing aggregates supply, including a requirement for the preparation of an annual Local Aggregates Assessment [LAA] by mineral planning authorities [MPAs] working individually or jointly.

Spatial Coverage of the Local Aggregate Assessment

1.2 The county of Devon comprises four separate MPAs – Devon County Council, Plymouth City Council, Torbay Council and Dartmoor National Park Authority – together with part of the area covered by Exmoor National Park Authority, as shown by the coloured areas in Figure 1.1. The sub-regional apportionment of the National and Regional Aggregates Guidelines has traditionally used this 'Devon' grouping rather individual MPAs, recognising the small number of quarries within some of the MPA areas and the close relationship between quarries and markets in those areas.

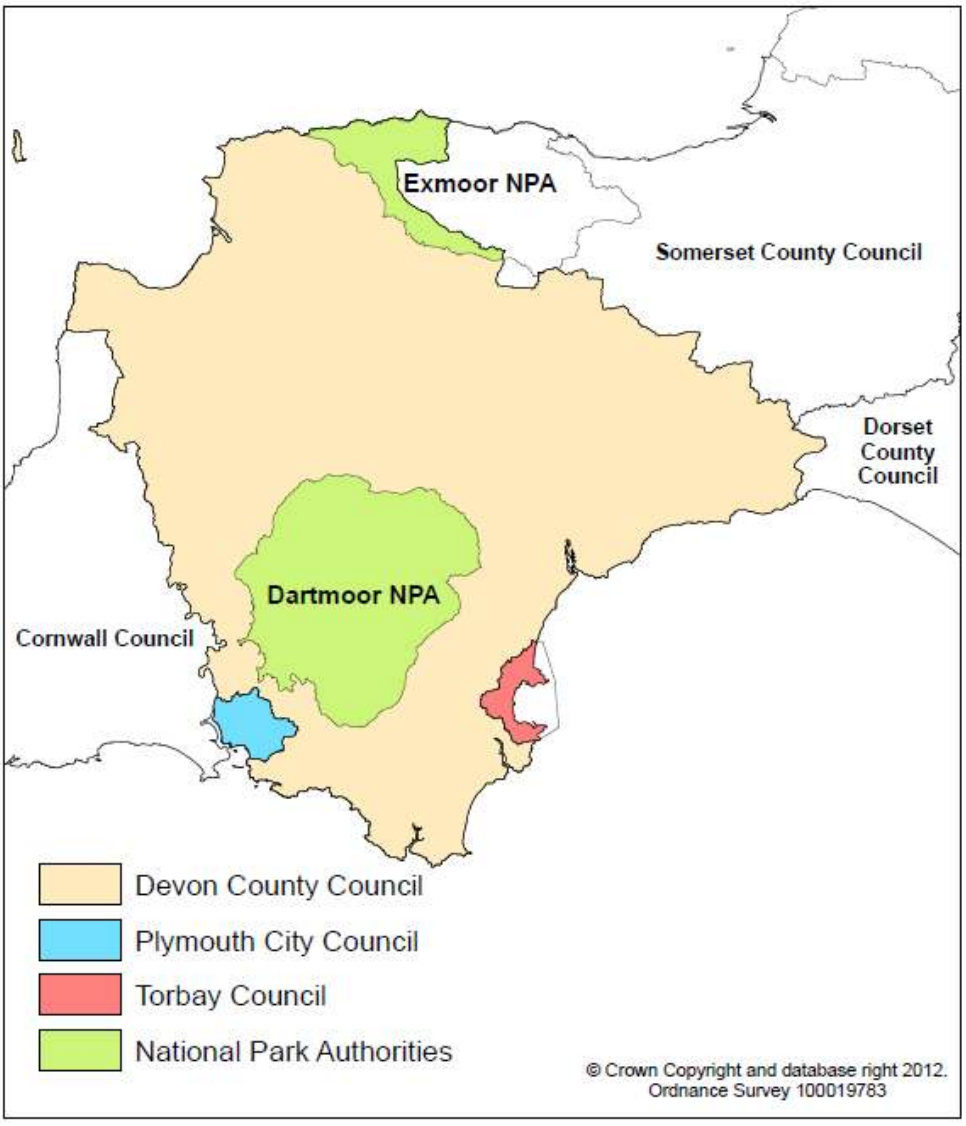


Figure 1.1: Mineral Planning Authorities in Devon and adjoining areas

1.3 While each of the Devon MPAs is currently working separately on its plan-making for minerals, a joint Devon LAA is considered to represent a better option than MPAs preparing individual assessments for the following reasons:

- with there being only two aggregate quarries within Dartmoor National Park and one in Plymouth, it would be difficult to present sales and reserves data separately for those areas while maintaining commercial confidentiality for mineral operators;
- preparation of a joint LAA facilitates better understanding of the cross-boundary aggregates issues; and
- a joint LAA makes efficient use of available expertise and simplifies the collection of data.

1.4 Consideration was given to whether Devon's LAA should be prepared jointly with one or more neighbouring counties. However, the relatively self-contained pattern of aggregates production and consumption in Devon, together with adjoining counties' relationships with other areas, warrant limiting the spatial extent to the county of Devon.

1.5 The LAA has been prepared by Devon County Council in discussion with the other Devon MPAs, and contributes to the evidence base for each of the five MPAs. For the purposes of this assessment, 'Devon' should be taken to refer to the historic county comprising the four whole MPAs and part of a fifth referred to in 1.2.

1.6 A draft of the LAA was published in November 2012 for discussion with the South West Aggregate Working Party, with comments also invited from other interested parties. A summary of the responses received is provided in Appendix C.

Timescale for the Local Aggregate Assessment

1.7 The Local Plans[1] prepared by Devon's MPAs that collectively provide the county's minerals planning policy framework have been, or are being, prepared to different time horizons:

Plymouth City Council[2]	2006-2021
Dartmoor National Park Authority[3]	2006-2026
Torbay Council[4]	2006-2026
Exmoor National Park Authority[5]	2011-2030
Devon County Council[6]	2011-2031

1.8 It is considered appropriate for the LAA to look ahead to 2031 to ensure that it provides the necessary information for the longest of these time horizons, which will also help to inform MPAs preparing to review and replace their existing plans.

[1] The term 'Local Plan' includes Core Strategies and other Development Plan Documents
[2] Adopted Core Strategy and North Plymstock Area Action Plan
[3] Adopted Core Strategy
[4] Emerging Local Plan
[5] Emerging Local Plan
[6] Emerging Minerals Plan

Purpose of the Local Aggregate Assessment

1.9 The NPPF indicates that the LAA is intended to assist MPAs in planning "for a steady and adequate supply of aggregates", taking account of the advice of an Aggregate Working Party and being "based on a rolling average of 10 years sales data and other relevant local information". Provision for land-won and other aggregates identified in the LAA should be made in minerals plans through identification of "specific sites, preferred areas and/or areas of search and locational criteria as appropriate".

1.10 MPAs should also take account of published National and Sub National Guidelines [DCLG (2009)] for aggregate provision "as a guideline". Prior to the NPPF, the regional guidelines were apportioned to MPAs or groups of MPAs (usually based on the historic county boundaries), but this process has been replaced by the requirement for LAAs and their consideration by Aggregate Working Parties.

1.11 The NPPF maintains the role of landbanks in providing "an indicator of the security of aggregate minerals supply", with landbanks of at least seven years for sand and gravel and ten years for crushed rock being required. Separate landbanks for "aggregate materials of a specific type or quality which have a distinct and separate market" are suggested.

1.12 DCLG has also published further guidance on the managed aggregates supply system [DCLG (2012b)] to which regard has been had in the preparation of the draft LAA.

1.13 In the context of the guidance provided in the NPPF, it is considered that the purpose of the Devon LAA is to provide a rolling evidence base to inform the approach to be taken in the Local Plans of the individual MPAs to the supply of aggregates. This evidence should include information on:

- sales of land-won and other aggregates in preceding years;
- the availability of aggregates to meet future supply, including the extent of landbanks for land-won aggregates;
- the relationship of aggregates production in Devon with other areas, including the extent of inward and outward movements of aggregates; and
- consideration of the infrastructure available for the inward and outward movement of aggregates by the sustainable transportation methods of rail and sea.

1.14 The LAA does not itself propose the level or composition of aggregate supply to be delivered in Devon or identify the locations from which any new supply should be achieved. Such decisions are the responsibility of the individual MPAs to deliver through their Minerals/Local Plans, informed by the evidence presented in the LAA.

1.15 The LAA will be published annually to inform development and monitoring of Local Plans, including recent sales and revisions to levels of reserves and the length of landbanks.

Definitions

1.16 This assessment uses the following terminology for aggregate resources:

Aggregates	Granular materials used in construction
Land-won aggregates	Aggregates quarried from limestone, sandstone and igneous/metamorphic rocks (collectively termed crushed rock) and from sand and gravel formations and superficial deposits (including beach and estuarial deposits)
Marine aggregates	Sand and gravel dredged from the sea
Secondary aggregates	Aggregates derived from the extraction and processing of non-aggregate minerals (e.g. china clay and ball clay), or as a by-product of industrial processes (e.g. blast furnace slag, incinerator bottom ash)
Recycled aggregates	Aggregates derived from the processing of inorganic construction, demolition and excavation waste [CDEW]
Alternative aggregates	A grouping of secondary and recycled aggregates

Abbreviations

1.17 The following abbreviations are used in this assessment:

AMRI	Annual Minerals Raised Inquiry
CDEW	Construction, Demolition & Excavation Waste
DCLG	Department for Communities and Local Government
HSA	High-specification Aggregate
LAA	Local Aggregate Assessment
MPA	Mineral Planning Authority
NPPF	National Planning Policy Framework
ODPM	Office of the Deputy Prime Minister
PSV	Polished Stone Value
RAWP	Regional Aggregate Working Party
SWAWP	South West Aggregate Working Party

2. DEVON'S GEOLOGY AND LAND-WON AGGREGATE RESOURCES

2.1 Devon has arguably the most diverse geology of any English county, resulting in a wide range of mineral resources having been exploited for use not only as aggregates but also for a range of industrial purposes, brick manufacture and as building stone.

2.2 Crushed rock aggregates are currently produced from a range of sandstone, limestone and igneous/metamorphic resources, while sand and gravel is quarried from various 'bedrock' deposits with no superficial deposits presently worked.

2.3 An assessment of the land-won and secondary aggregate resources in Devon [Scrivener, R & Miles, A J (2010)] was commissioned by Devon County Council, and reference should be made to this for a detailed account of current and potential resources. The resources yielding land-won aggregates within Devon in 2011, together with relevant quarries operational in that year, are outlined in Table 2.1.

Resource	Geological Formation	Quarries
Limestone	Chercombe Bridge Limestone (Devonian)	Linhay Hill
	East Ogwell Limestone (Devonian)	Stoneycombe
	Plymouth Limestone (Devonian)	Moorcroft
	Westleigh Limestone (Carboniferous)	Westleigh
Sandstone	Pickwell Down (Devonian)	Vyse
	Pilton Shales (Devonian / Carboniferous)	Bray Valley, Hearson
	Bude (Carboniferous)	Beam, Newbridge, Bableigh Wood
	Crackington (Carboniferous)	Knowle
Igneous / Metamorphic	Dolerite (Devonian / Carboniferous)	Trusham, Meldon
	Hornfels	Meldon
Sand and Gravel	Dawlish Sandstone (Permian)[7]	Bishop's Court
	Budleigh Salterton Pebble Beds (Triassic)	Blackhill, Rockbeare, Venn Ottery, Hillhead, Town Farm
	Upper Greensand (Cretaceous)	Zig Zag
	Aller Gravels (Eocene)	Zig Zag

Table 2.1: Land-won aggregate resources in Devon, 2011

2.4 The extent of the geological formations currently yielding sand and gravel, limestone and sandstone is illustrated in Figure 2.1, together with the location of aggregate quarries operational in 2011. While the extent of sandstone resources appears large, it should be noted that these are very variable in quality, and the outcrops with potential economic viability will be much more limited. No indication is given of the location of the currently quarried igneous and metamorphic rocks as their limited extent will not be apparent at this scale of mapping.

[7] Current supply of sand from the Dawlish Sandstone formation is limited to stockpiles of material extracted from a development site

2.5 Up to the early 2000s, sand and gravel had been worked from superficial deposits, notably the river terrace deposits of the Axe valley at Kilmington. While this and other river valleys in Devon have potential river terrace and alluvial resources, their commercial viability is restricted by their limited depth and areal extent. Similar constraints, together with environmental designations, limit the likelihood of estuarine dredging (formerly undertaken in the Taw/Torridge and Teign estuaries) recommencing.

2.6 Figure 2.1 illustrates the uneven distribution of aggregate resources within Devon, with sand and gravel formations occurring in the younger rocks of the south east of the county, and sandstone formations in the north west. The limestone resources that deliver the bulk of Devon's crushed rock output are clustered around Plymouth, Newton Abbot and adjacent to the Somerset border.

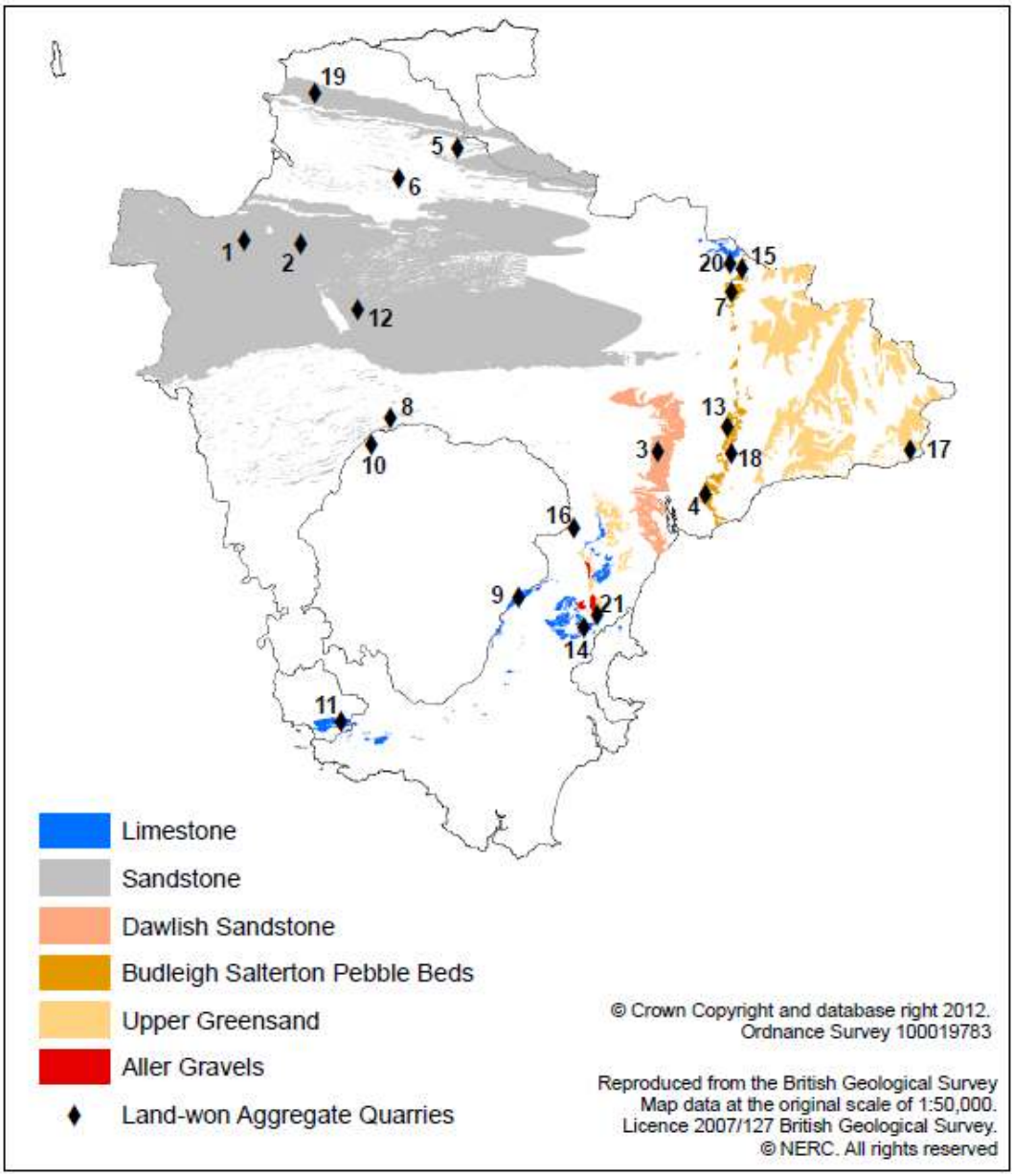


Figure 2.1: Location of currently-quarried geological formations and land-won aggregate quarries operational in 2011 (key to quarries in Appendix B)

3. PAST AND CURRENT SUPPLY OF LAND-WON AGGREGATES

Past Sales of Land-won Aggregates

3.1 Sales of land-won aggregates originating within Devon over the 20 year period from 1992 to 2011 are shown in Figure 3.1[8].

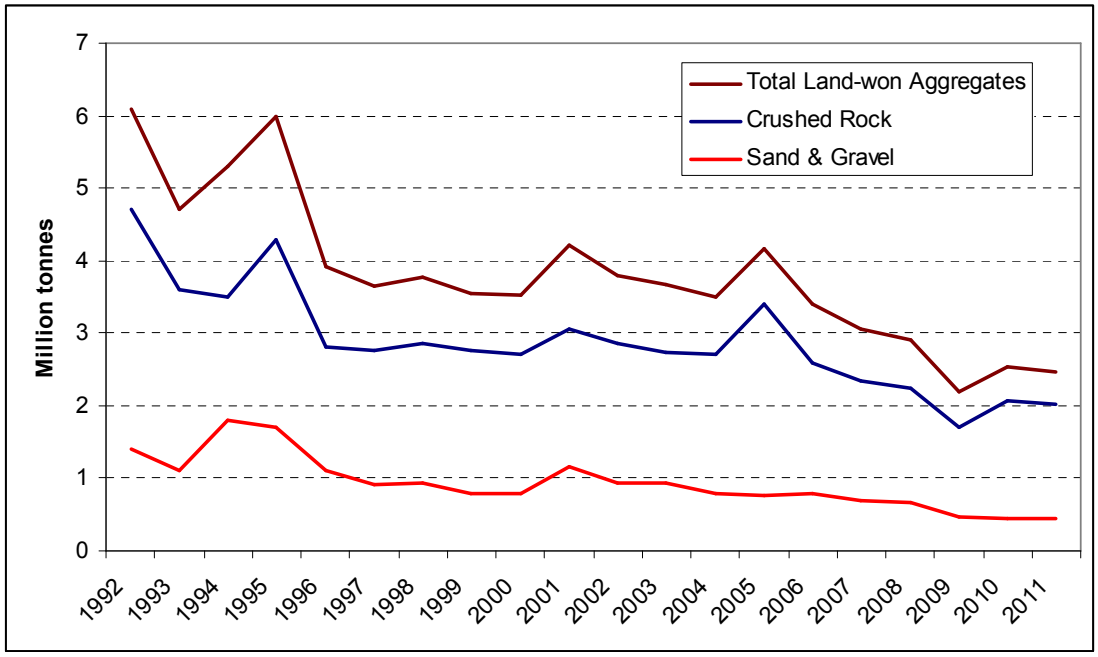


Figure 3.1: Sales of land-won aggregates in Devon, 1992-2011

3.2 While the early part of this period showed significant variation in sales of land-won aggregates, the years from 1996 onwards showed a steadier trend before a peak in 2001. Since 2001, sand and gravel sales have generally declined, remaining level from 2004 to 2006 but dropping more steeply in 2009. Crushed rock sales have been broadly downward since 2001, with the exception of a notable peak in 2005 (understood to be related to major highway schemes that year) and an upturn in 2010.

3.3 The NPPF requires an LAA to be based on a rolling average of sales over ten years, and sales figures for this period are provided in Table 3.1 and illustrated in Figure 3.2. These figures provide weighted ten year averages[9] of 2.28 million tonnes for crushed rock [CR] and 0.61 million tonnes for sand and gravel [S&G].

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CR	2.85	2.74	2.70	3.40	2.60	2.35	2.24	1.71	2.08	2.02
S&G	0.94	0.93	0.79	0.77	0.79	0.70	0.66	0.48	0.45	0.44
Total	3.79	3.67	3.49	4.17	3.39	3.05	2.90	2.19	2.53	2.46

Table 3.1: Sales of land-won aggregates in Devon, 2002-2011 (million tonnes)

[8] Sales figures are derived from survey work undertaken by Devon County Council using data provided by mineral operators as explained in Appendix A

[9] See Appendix A for an explanation of the use of weighted averages

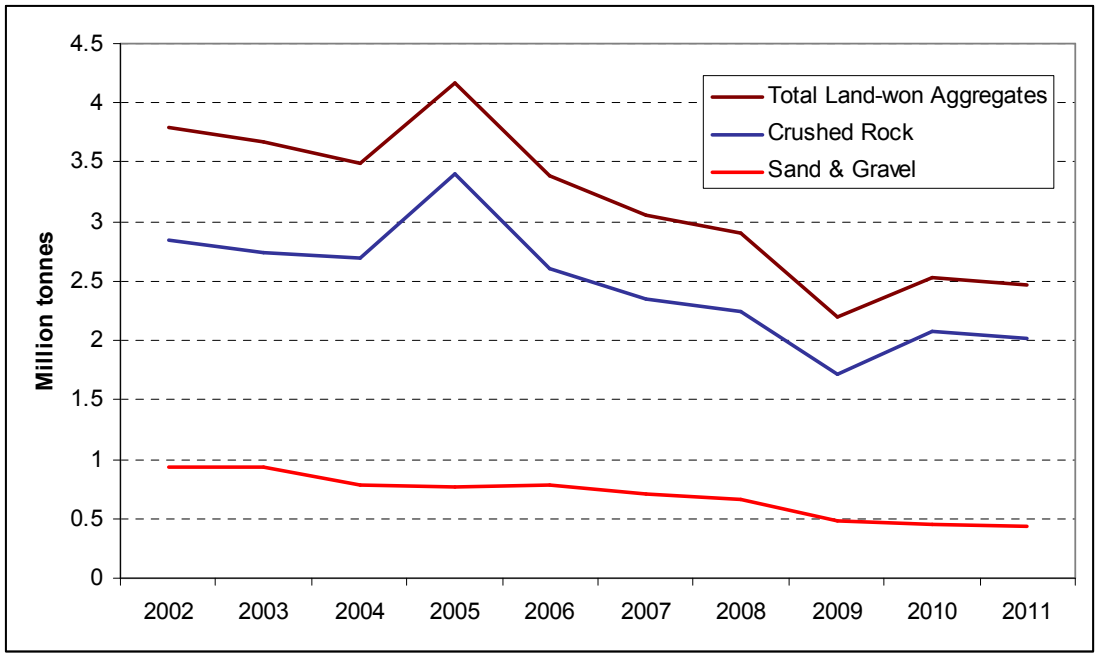


Figure 3.2: Sales of land-won aggregates in Devon, 2002-2011

3.4 During the past ten years, the proportion of land-won aggregates accounted for by crushed rock has gradually increased from 75% to 82%, as illustrated in Figure 3.3 (a comparison of sales of land-won and other sources of aggregates is provided in Figures 4.2 and 4.3 later in this Assessment).

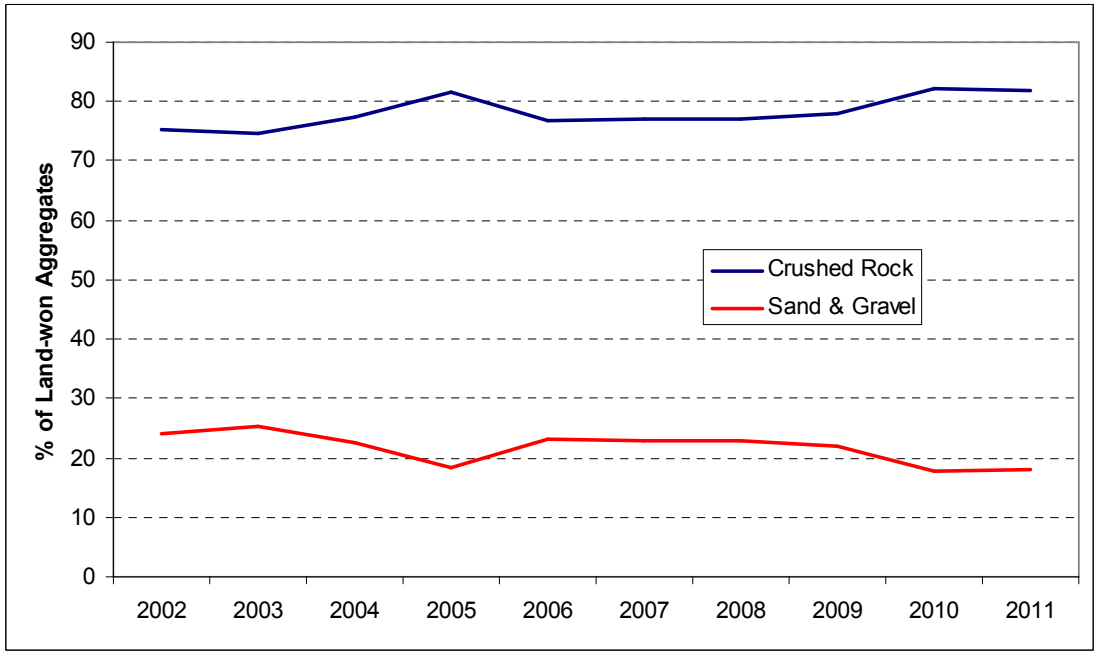


Figure 3.3: Share of Devon's Land-won Aggregate Production, 2002-2011

3.5 Over the past 10 years, the proportion of crushed rock aggregates sold in Devon accounted for by limestone has increased, reflecting the lower levels of waste and ease of working in comparison with other rock types, together with the location of the limestone quarries in relation to the main settlements and transport routes. Figure 3.4 shows the proportions of crushed rock sales accounted for by the three types of rock.

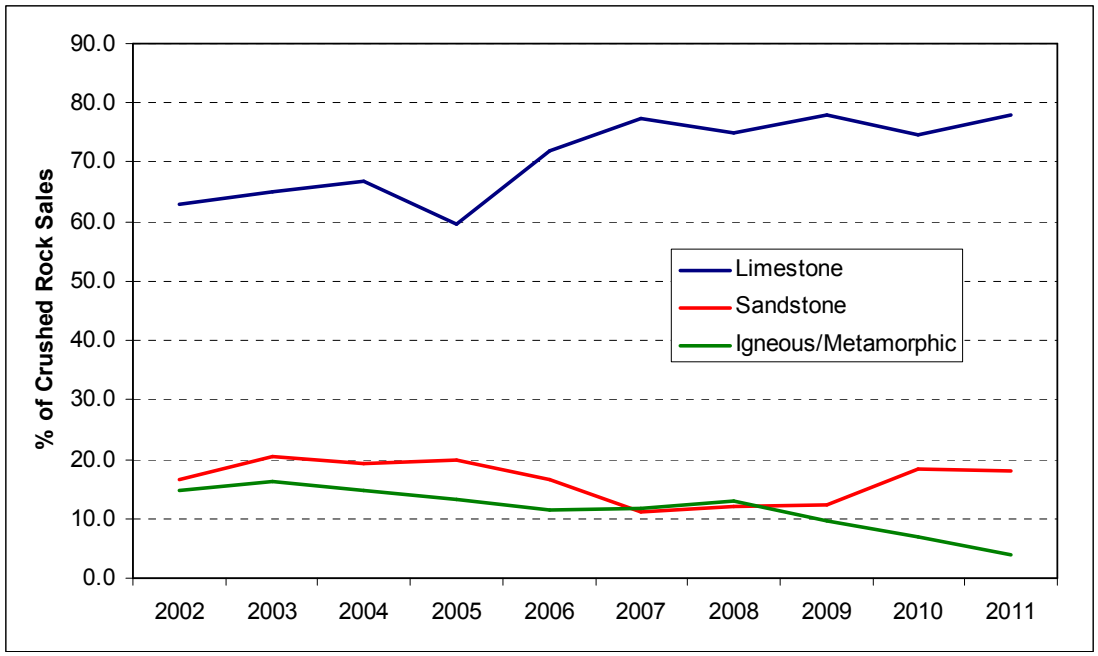


Figure 3.4: Share of Devon's crushed rock sales by rock type, 2002-2011

3.6 For sand and gravel, the proportion of sales derived from the Budleigh Salterton Pebble Beds has remained fairly constant during the last ten years at around 85%, as indicated in Figure 3.5. However, the relative proportions derived from the northern (i.e. Whiteball/Town Farm and Hillhead Quarries) and southern (i.e. Blackhill, Venn Ottery and Rockbeare Quarries) parts of the Pebble Beds have changed significantly as shown in Figure 3.6. While Hillhead Quarry was the largest contributor to supply from the Pebble Beds in the first part of the 10 year period, extraction ceased there in the second part, with sales limited to materials from stockpiles.

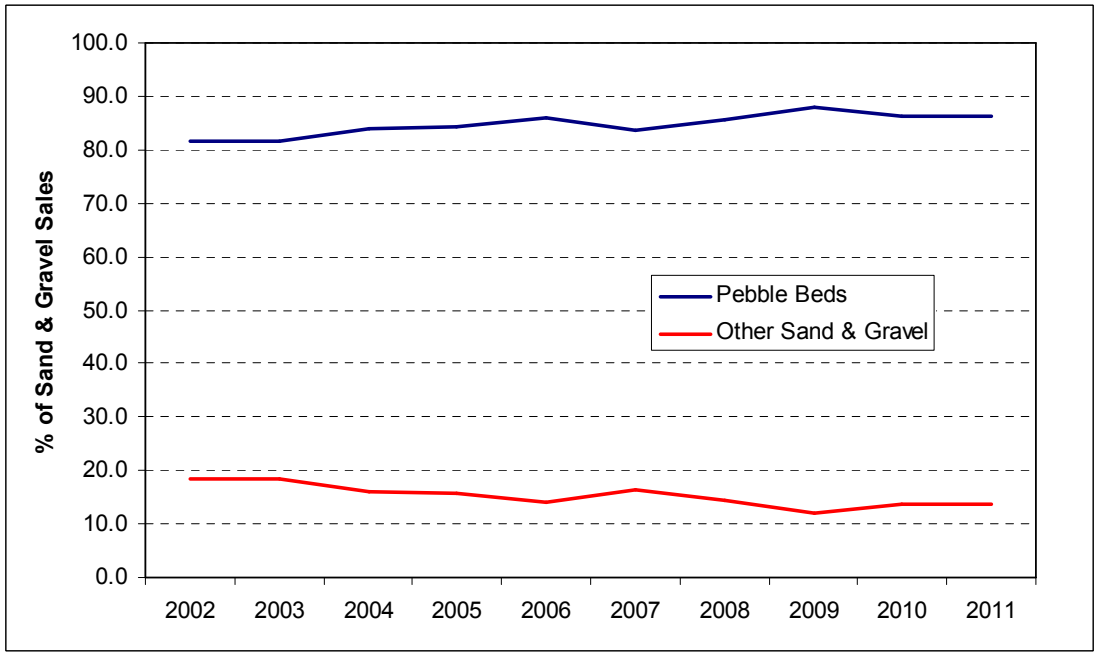


Figure 3.5: Share of Devon's sand and gravel sales by type, 2002-2011

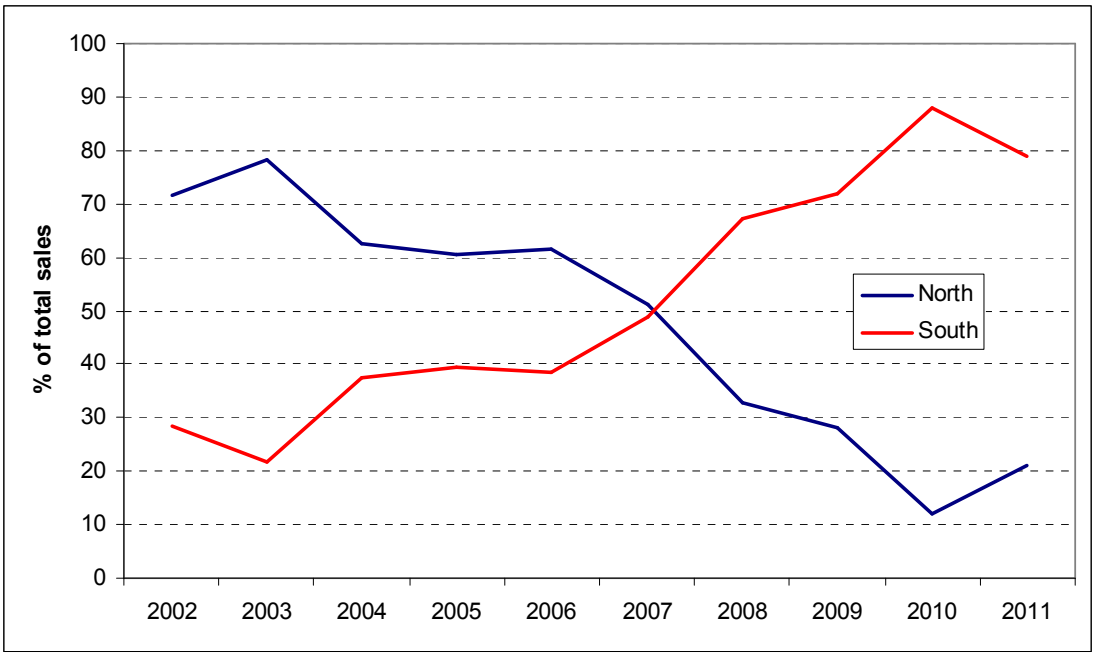


Figure 3.6: Relative proportions of sales from Budleigh Salterton Pebble Beds in northern and southern areas, 2002-2011

Comparison of Past Sales with Sub-regional Apportionments

3.7 Prior to the NPPF, the managed aggregates supply system comprised the publication of national and regional aggregates guidelines, and the sub-regional apportionment (generally to the county level) of the regional figures by the regional planning body in discussion with the Regional Aggregate Working Party [RAWP].

3.8 In the South West, the apportionment of the Government's regional guidelines for 2005-2020 was not formally completed following abolition of the regional planning body, although the RAWP provided its technical advice to the Secretary of State on an appropriate sub-regional apportionment.

3.9 Table 3.2 provides the sub-regional apportionment for Devon[10] of the national and regional guidelines for 2001 to 2016 and the RAWP's technical advice on the 2005-2020 guidelines.

2001-2016 Guidelines		**2005-2020 Guidelines**	
Crushed Rock	Sand & Gravel	Crushed Rock	Sand & Gravel
3.50	1.36	3.20	0.93

Table 3.2: Sub-regional aggregates apportionments for Devon (million tonnes)

3.10 A comparison of these apportionment figures with actual sales of land-won aggregates over the past ten years is given in Figure 3.7. This indicates that the only occasion that actual sales reached an apportionment level was the peak in crushed rock sales in 2005. The increasing gap between actual and forecast output from 2006 supports the use of an average of past local sales, rather than sub-regional apportionments based on nationally-generated figures, as a basis for future provision.

[10] For sand and gravel, the apportionment groups Devon with Cornwall and Somerset due to the low production levels in those counties

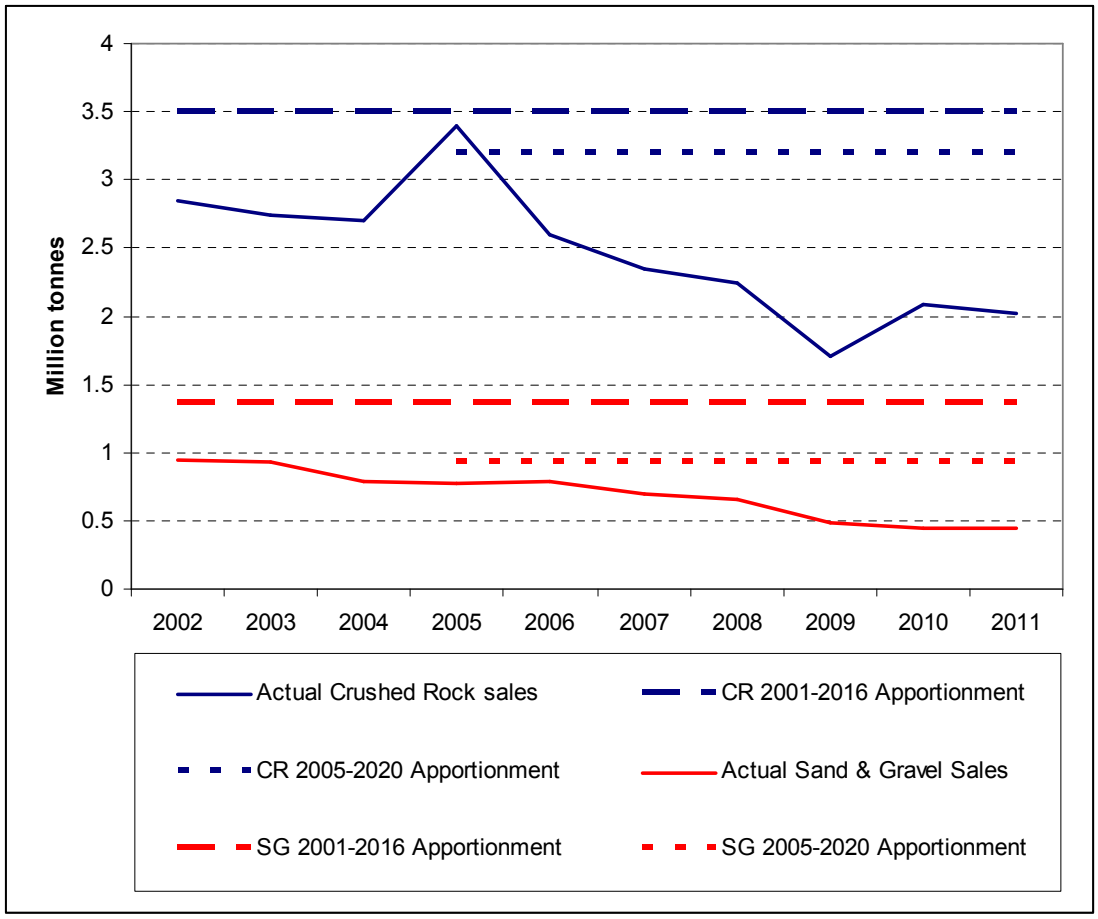


Figure 3.7: Comparison of land-won aggregate sales 2002-2012 and Devon's sub-regional apportionments (CR – Crushed Rock; SG – Sand & Gravel)

Current Availability of Land-won Aggregate Resources

3.11 Devon's existing aggregate quarries have substantial permitted reserves of crushed rock aggregates, but more limited reserves of sand and gravel. Table 3.3 shows the permitted reserves available at 31st December 2011 in Devon[11].

Resource		Permitted Reserves
Crushed Rock	Limestone	88.63
	Sandstone	19.87
	Igneous/Metamorphic	38.63
	Total Crushed Rock	**147.13**
Sand & Gravel		**9.16**

Table 3.3: Permitted reserves of primary aggregates in Devon at 31 December 2011 (million tonnes)

3.12 The NPPF seeks the maintenance of landbanks of land-won aggregates of at least seven years for sand and gravel and at least ten years for crushed rock. Using weighted averages of sales over the past ten years (2002-2011) as indicated in paragraph 3.3, the land-won aggregate landbanks can be calculated from these permitted reserves as follows:

Crushed rock landbank 64.5 years

[11] Excluding Dormant sites

Sand and gravel landbank 15.0 years

The Crushed Rock Landbank

3.13 The crushed rock landbank is well in excess not only of the ten year minimum required by the NPPF, but also the time horizons of the adopted or emerging Minerals/Local Plans of the Devon MPAs. As shown in Table 3.4, substantial landbanks exist for the individual types of crushed rock.

Resource	10 Year Weighted Average Production (million tonnes)	Landbank (Years)
Limestone	1.66	53.4
Sandstone	0.38	52.3
Igneous/Metamorphic	0.24	161.0

Table 3.4: Landbanks for crushed rock aggregates in Devon at 31 December 2011

3.14 While the overall crushed rock landbank is extensive, there are limited available reserves of high-specification aggregates [HSAs] from Devon's operational quarries. HSAs provide materials with polished-stone values [PSV] in the mid to high 60s that are suitable for skid-resistant road-surfacing. Within Devon, only Bray Valley Quarry is currently producing materials with a PSV above 60. A further significant source of HSAs for the Devon market is Pigsdon Quarry in Cornwall, located close to the Devon boundary near Bude, while HSAs have also been transported from quarries elsewhere in England and in South Wales and Ireland.

3.15 Research [Thompson *et al* (2004)] indicates that Devon's sandstone resources, notably the Bude Formation that outcrops between the Cornwall border and the Exe Valley, are capable of yielding HSAs with PSV above 60 and, in some cases, above 65. While Scrivener & Miles (2010) identified those parts of the Bude and Crackington Formations with potential for high-PSV resources, these areas will need further refinement through site investigation by the minerals industry before the presence of economic resources can be established.

3.16 The NPPF (paragraph 145) suggests the use of separate landbanks for "aggregate materials of a specific type or quality which have a distinct and separate market", which could encompass HSAs. However, the variability of sandstone resources within a quarry renders it difficult to calculate specific reserves for HSAs, while there are confidentiality issues with identifying a landbank to which a limited number of quarries contribute. It is therefore not proposed to identify a separate landbank for HSAs, but the delivery of further resources will be an issue to be addressed in Devon County Council's Minerals Plan[12].

3.17 The forthcoming round of periodic reviews of mineral permissions required by Schedule 14 of the Environment Act 1995 may see a small number of permissions for crushed rock quarries lapsing if operators or landowners fail to submit new working schemes. However, the considerable length of the

[12] Potential HSA resources in Devon are limited to the north and west of the county within the area for which Devon County Council is MPA

crushed rock landbank provides an adequate buffer to ensure it can be maintained for at least the Plan periods for Devon's MPAs

The Sand and Gravel Landbank

3.18 In contrast to the position with crushed rock, the landbank for sand and gravel calculated using the weighted average of sales over the past ten years, although greater than the seven years minimum required by the NPPF, does not extend to the 2031 end date of Devon County Council's emerging Minerals Plan[13].

3.19 While some MPAs distinguish between sharp sand and soft sand in their landbanks and LAA, the nature of Devon's sand and gravel resources does not warrant such a distinction, with resources such as the Budleigh Salterton Pebble Beds and Aller Gravels being capable of providing concreting (sharp) and building (soft) sand together with gravel fractions. Paragraph 145 of the NPPF does, however, also highlight that longer periods for landbanks may be warranted to take account of "locations of permitted reserves relative to markets".

3.20 Reflecting the pattern of sand and gravel production highlighted in paragraph 3.6, approximately 85% of the current sand and gravel reserves are located within the Budleigh Salterton Pebble Beds. However, the major proportion of these are located within the northern area of the Pebble Beds (i.e. Town Farm and Hillhead quarries) with more limited reserves remaining in the southern area. Devon County Council has consulted on options for the spatial pattern of sand and gravel production [Devon County Council (2011)], and its Minerals Plan will need to consider the relationship between the location of the reserves making up the landbank and the spatial pattern of working to be pursued.

3.21 Potential constraints on the maintenance of the sand and gravel landbank are (a) the limited duration of planning permissions for some of the existing quarries, and (b) the scope for permissions to lapse if the periodic review schemes required by Schedule 14 of the Environment Act 1995 are not submitted. While there are opportunities for operators to seek the extension of these time limits, failure to do so would lead to lapsing of planning permissions and consequent loss of permitted reserves. Table 3.5 identifies those sand and gravel reserves for which planning permission is due to expire prior to 2031.

Quarry	**Permission Time Limit**
Babcombe Copse/Sands Copse	21st February 2015
Rockbeare (Marshbroadmoor)	25th April 2015
Hillhead (Houndaller)	31st December 2018
Uplyme	31st December 2019
Zig Zag	31st December 2020
Haldon	31st December 2022[14]
Town Farm	27th June 2023

Table 3.5: Sand and gravel planning permission expiry dates

[13] The absence of sand and gravel resources from Plymouth, Torbay and the two National Parks limits the scope of existing and potential supply to the area for which Devon County Council is the MPA

[14] In the event of the current planning application being approved, otherwise the existing permission will expire in 2058

3.22 For most of the quarries listed in Table 3.5, the extent of remaining reserves and recent levels of sales suggest that the reserves will be worked out by the expiry date. However, as indicated in Table 3.6, no extraction has taken place over the last two calendar years at Hillhead, Haldon or Babcombe Copse/Sands Copse, and it may therefore be the case that, unless working recommences at these sites, some or all of their remaining reserves will 'disappear' unless permission is obtained to extend the current consent.

Quarry	Resource	Current Status
Babcombe Copse / Sands Copse, Kingsteignton	Upper Greensand & Aller Gravels	Inactive with no extraction in 2010 or 2011. Operator surrendered lease in May 2012 following removal of plant.
Bishop's Court, Exeter	Dawlish Sandstone	Site sold for non-mineral development, although removal of stockpiled sand is continuing during 2012.
Blackhill, Woodbury	Budleigh Salterton Pebble Beds	Extraction of remaining reserves was completed in 2011. Plant is retained for processing materials transported from other sites.
Haldon, Kennford	Haldon Gravels	Inactive since 2005, since when the site has changed hands. An application for a revised working scheme and increased annual output was submitted in 2011 and is awaiting determination.
Hillhead, Uffculme	Budleigh Salterton Pebble Beds	No extraction undertaken since 2009, although small quantities have been sold from stockpiles. Plant has been removed.
Rockbeare Hill, Rockbeare	Budleigh Salterton Pebble Beds	Limited remaining reserves are being worked on a campaign basis and transported to Blackhill for processing.
Town Farm, Burlescombe	Budleigh Salterton Pebble Beds	Working has moved into the extension area approved in 2010. Materials are transported to Whiteball (Somerset) for processing.
Uplyme	Upper Greensand	No extraction of sand and gravel is currently undertaken, but small quantities are taken from a stockpile of previously-excavated material. Working of the overlying chalk for agricultural purposes continues.
Venn Ottery	Budleigh Salterton Pebble Beds	Extraction recommenced in April 2011, with materials transported to Blackhill for processing.
Zig Zag, Kingskerswell	Upper Greensand & Aller Gravels	Extraction continuing with processing on site.

Table 3.6: Status of permitted sand and gravel sites in Devon

3.23 Town Farm forms part of Hanson's Whiteball operation, for which the processing plant lies in Somerset adjacent to its border with Devon. In recent years, virtually all extraction of sand and gravel for Whiteball has taken place within Devon, most recently at Town Farm where planning permission was granted in 2010 for an extension with an anticipated life of ten years[15].

[15] The application identified a reserve of 2 million tonnes with an annual extraction rate of 200,000 tonnes

3.24 Following completion of extraction at Town Farm, it is anticipated that the Whiteball processing plant will be supplied from materials extracted in Somerset, for which Somerset County Council's Minerals Local Plan identifies a Preferred Area and an Area of Search. This suggests that, during the later part of the period to 2031 covered by the LAA, some of the sand and gravel supply previously delivered from Devon will be met from Somerset.

4. MARINE AND ALTERNATIVE AGGREGATES

4.1 In addition to its resources of land-won aggregates, Devon is able to utilise a range of other aggregate resources:

- marine sand and gravel dredged from the Bristol Channel and landed at Appledore in small quantities for the northern Devon market;
- secondary aggregates from the processing of waste from china clay operations at Lee Moor and, to a lesser extent, from ball clay in the Bovey Basin and slate waste at Mill Hill Quarry; and
- recycled aggregates from the processing of CDEW at a network of recycling facilities, some of which are located at operational quarries, and at construction sites.

4.2 This part of the assessment reviews the nature of these sources of aggregates, their recent levels of supply and the current availability of resources and/or capacity for their processing.

Marine Aggregates

4.3 Small quantities of marine-dredged sand and gravel originating from the Bristol Channel are landed at Appledore and sold to the local North Devon market. Since this is undertaken by a single operator, the sales figures are regarded as being confidential; however, annual quantities in the range 30-60,000 tonnes are typical. This resource thus makes only a small contribution to Devon's aggregates supply (around 1%), in contrast to the national picture whereby 21% of England and Wales' sand and gravel supply is from marine sources [Mineral Products Association (undated)].

4.4 Marine aggregates are landed in greater quantities at ports in Somerset and Dorset, but are understood not to supply markets in Devon to any significant degree.

4.5 The two main constraints on the level of marine aggregate supply are the extent and location of licensed dredging areas and the capacity of wharves for landing the materials.

Licensed Dredging Areas

4.6 Dredging for marine aggregates is licensed by the Crown Estate, which licenses several areas within the Bristol Channel including that from which materials are landed at Appledore. Within the English Channel, the closest licensed area to Devon is just west of the Isle of Wight, but no materials from this area are landed at any port west of Poole.

4.7 The Crown Estate's monitoring report for 2011 [Crown Estate (2012)] indicates that 0.96 million tonnes were dredged that year from the Bristol Channel, amounting to 29.5% of the annual licensed tonnage, with 0.41 million tonnes being landed at English wharves and the remainder in Wales. Dredging took place within only 6.1% of the licensed areas. The extent and intensity of use of the licensed areas would therefore not appear to be an

obstacle to an increased level of dredging to supply Devon if demand warranted it.

Wharf Capacity

4.8 No figures are available on the maximum annual throughput of the wharves at Appledore that are, or have been, used for landing marine aggregates. However, there are three wharves within the port that have been used for unloading marine aggregates in greater quantities than is the case recently, which suggests that adequate capacity is available provided that these remain unconstrained by other development.

Secondary Aggregates

4.9 The major source of secondary aggregates in Devon over the past ten years is the waste derived from the extraction and processing of china clay in the Lee Moor area of Devon, which accounts for 80-90% of the county's production of secondary aggregates. For each tonne of saleable china clay, up to nine tonnes of waste are produced, with two main elements capable of use as secondary aggregate:

- stent (waste rock), which can be used as general fill or, after crushing and screening, for other aggregate purposes; and
- tip sand (washed material comprising quartz, unaltered feldspar and mica) which, with grading and washing, can be used for a variety of aggregate purposes including concrete, road sub-base and building sand.

4.10 In previous years, secondary aggregate operations at china clay sites have been fed from 'as dug' materials, and this remains the case with Tarmac's operation at Headon. Since the contraction of Imerys' Lee Moor china clay operations, Aggregate Industries have supplemented 'as dug' materials with processing of materials from a waste tip under a planning permission granted in 2009, with an estimated five million tonnes to be worked over 20 years.

4.11 Within the ball clay workings of the Bovey and Petrockstowe Basins, sand occurs as interburden within the clay seams and has been tipped as waste. Sand from the Bovey Basin has been processed for secondary aggregate and horticultural use, with Sibelco installing new plant at their Preston Manor works in 2005 to increase capacity and efficiency. However, Imerys has ceased the supply of ball clay sand to an aggregate operator.

4.12 Mill Hill Quarry works slate for building stone purposes, and has processed some of the waste materials for secondary aggregate purposes in recent years, albeit on a small scale in comparison with the china clay secondary aggregate operations.

4.13 The annual sales of secondary aggregates over the past ten years shown in Table 4.1 give a weighted average of 0.50 million tonnes, although they have been at a lower level from 2009. Figure 4.1 illustrates these sales alongside those for marine-dredged and recycled aggregates.

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0.48	0.60	0.54	0.54	0.58	0.63	0.63	0.39	0.39	0.42

Table 4.1: Sales of secondary aggregates in Devon, 2002-2011 (million tonnes)

4.14 In addition to the existing sources of secondary aggregates outlined above, other potential sources that may be available from within Devon in the future in the event of planned developments proceeding are:

- secondary aggregates from the processing of waste from tungsten and tin extraction at Hemerdon, near Plymouth, which is anticipated to commence extraction from late 2013; and
- the recycling of incinerator bottom ash derived from waste incineration in Devon.

4.15 A further source of secondary aggregate imported into Devon at present is blast furnace slag from Port Talbot in South Wales. This is transported by sea and landed at Teignmouth for use as a cement additive/substitute.

4.16 The location of the facilities for production of secondary aggregates is illustrated in Figure 4.4. With production of land-won sand and gravel concentrated in the eastern part of Devon, the china clay operations in the Lee Moor area are well-placed to supply sand and other secondary aggregates to Plymouth and south west Devon.

4.17 Potential physical constraints on future growth in the level of supply of secondary aggregates include the continued availability of raw materials for processing and the capacity of the processing plant. However, neither of these are anticipated to limit potential growth in secondary sales in Devon due to the ready availability of tipped waste materials in addition to 'as dug' material, together with the spare capacity of plant.

Recycled Aggregates

4.18 The waste arising from construction, demolition and excavation activity comprises a range of materials, of which the 'hard inert' elements (e.g. concrete, bricks, stone, road planings, rail ballast and glass) can be recycled for use as aggregates. Other elements of CDEW, due to their 'soft' and/or organic nature (e.g. soil, timber and plasterboard), are unsuitable for aggregate use but can be recovered or recycled for other beneficial uses. Recent national reports on CDEW have estimated that around 45% of the total arisings have been recycled for aggregate use.

4.19 Robust data on arisings of CDEW and the quantities of recycled aggregates derived from it are difficult to obtain, particularly for the county level. Estimates have therefore been developed from national and regional surveys and assumptions made about the proportions produced in Devon, as explained in Appendix A, and the resulting figures for the past ten years are provided in Table 4.2. The weighted ten year average is 1.25 million tonnes.

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1.39	1.31	1.33	1.35	1.37	1.38	1.40	1.12	1.12	1.12

Table 4.2: Estimated sales of recycled aggregates in Devon, 2002-2011 (million tonnes)

4.20 The broadly level pattern in recycled aggregates sales from 2002 to 2008 suggested by these estimated figures appears to be the result of a balance between a generally downward trend in the annual arisings of CDEW, due to more efficient site management, and an increasing rate in the proportion of

waste that is recycled. The latter factor is likely to have been influenced by the dual fiscal measures of the Aggregates Levy and Landfill Tax.

4.21 From 2008 onwards, a levelling off in the rate of recycling combined with a sharp drop in the volume of waste generated by the construction sector has resulted in lower sales of recycled aggregates, reflected in a similar pattern for secondary aggregates.

4.22 Figure 4.1 illustrates the levels of sales of recycled, together with marine and secondary, aggregates over the past ten years.

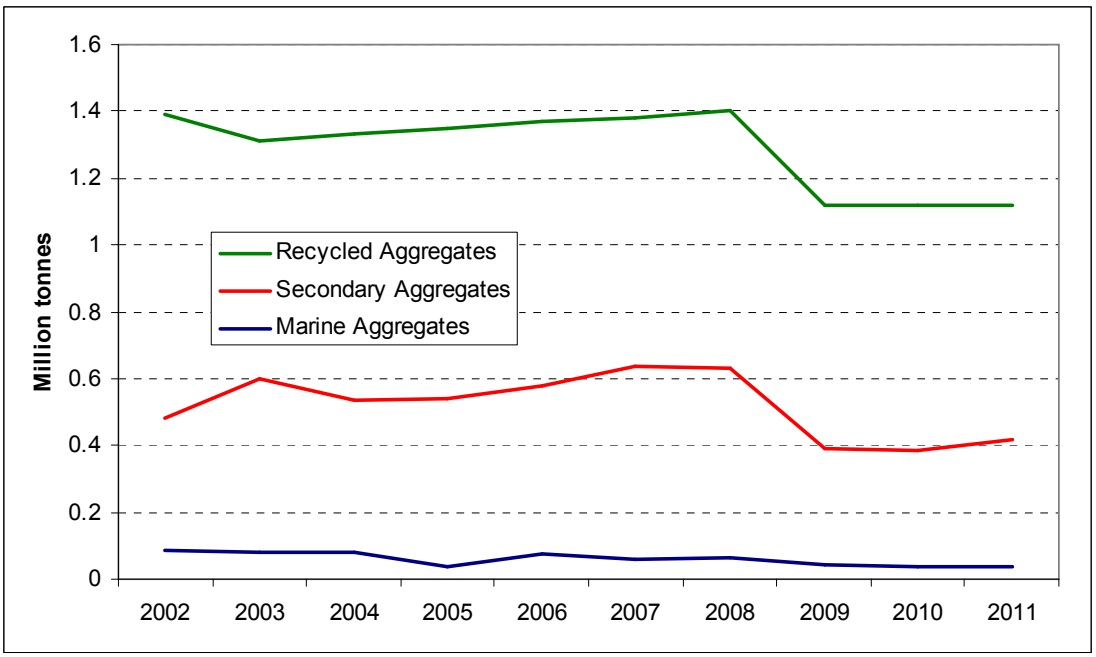


Figure 4.1: Sales of Marine and Alternative Aggregates in Devon, 2002-2011

4.23 To enable comparison of trends for land-won, marine and alternative sources of aggregates, Figure 4.2 illustrates the total annual sales for each aggregate stream, while Figure 4.3 shows the proportion of the total aggregate sales accounted for by each stream. The key points from these Figures is that the sales of recycled aggregates and, to a lesser extent, secondary aggregates have achieved an increasing share of the total aggregates market from 2005 (although levelling off from 2009), while crushed rock's share of the market has remained around 50% despite declining sales levels. Land-won sand and gravel has seen a gradual decline in its share of Devon's aggregates market from 16% in 2002 to 11% in 2011, while marine sand and gravel's contribution to supply has remained tiny in comparison with other aggregates (albeit remaining an important resource for the local North Devon market).

4.24 The recycling of CDEW in Devon is undertaken at two main types of site:

- fixed recycling sites, usually at a quarry, inert landfill site or waste transfer station, with aggregates sold on the open market and/or utilised in materials such as concrete produced at the same site; and

- temporary construction sites, with mobile plant being used to process the materials arising from demolition for use either on the same site (e.g. as construction fill or hardcore) or for sale off-site.

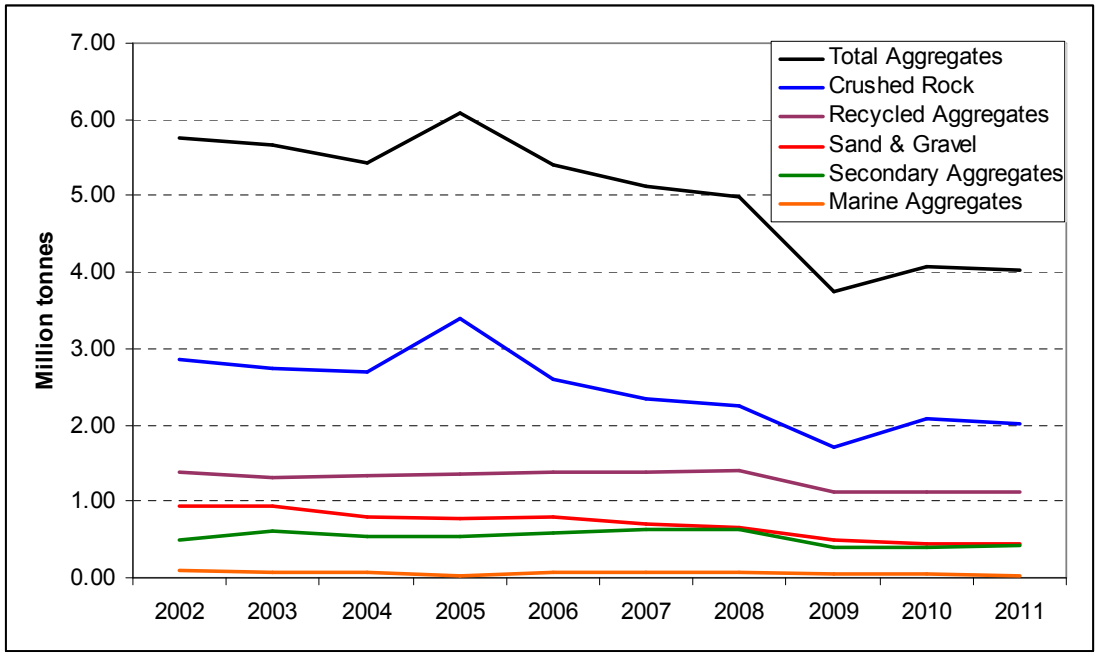


Figure 4.2: Total sales of land-won, marine and alternative aggregates in Devon, 2002-2011

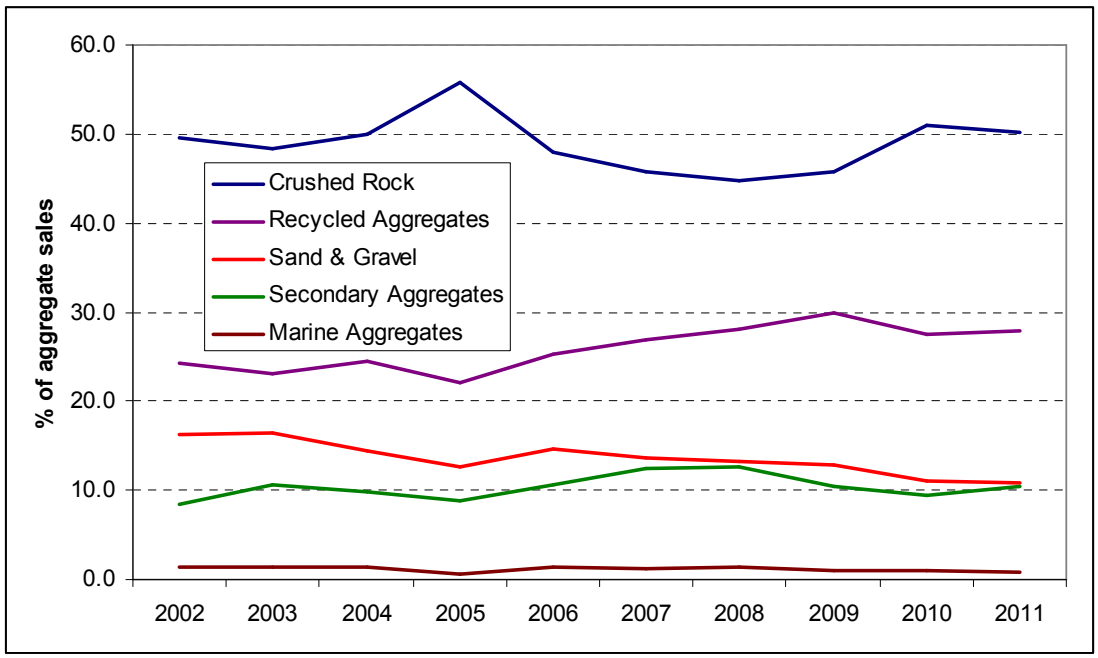


Figure 4.3: Relative sales of land-won, marine and alternative aggregates in Devon, 2002-2011

4.25 The distribution of facilities for the production of recycled and secondary aggregates, together with wharves for landing marine aggregates, is indicated in Figure 4.4. Recycled aggregate facilities are generally clustered close to the main urban areas of Plymouth, Torbay/Newton Abbot, Exeter and Barnstaple, providing a comprehensive network that helps in providing local supplies.

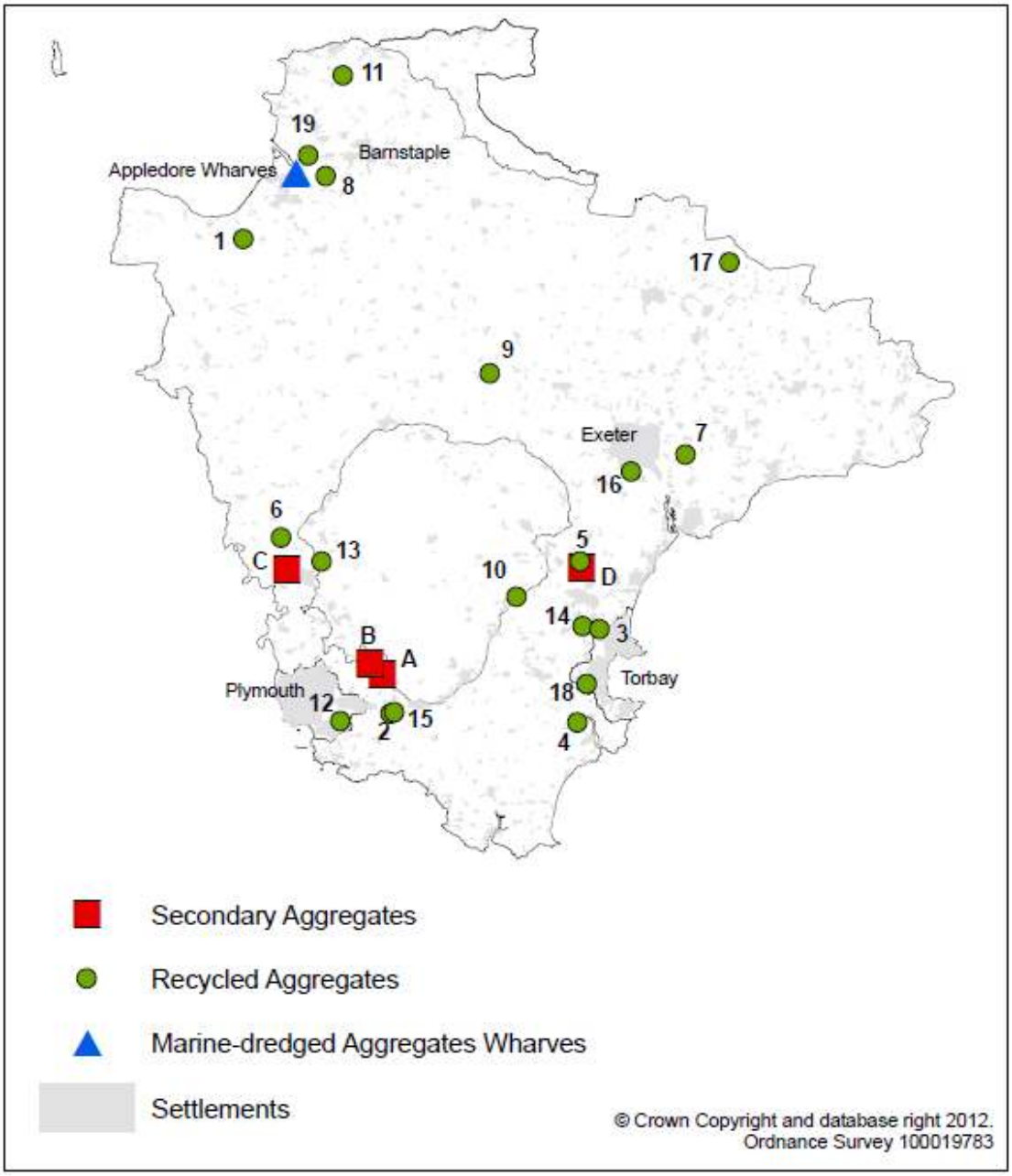


Figure 4.4: Location of secondary and recycled aggregate facilities and marine-dredged wharves operational in 2011 (key to sites in Appendix B)

4.26 Analysis based on a partial survey of recycling site operators together with review of limits in planning permissions and/or environmental permits suggests that Devon's operational CDEW recycling sites have a capacity for production of recycled aggregates in the region of 1.55 million tonnes. While this capacity would appear to be only a little above the highest annual production given in Table 4.2, it should be borne in mind that fixed recycling sites only account for a proportion (estimated at two thirds – see paragraph A.14) of the total volume of recycled aggregates produced in Devon. Future iterations of the LAA will provide more detail on actual and maximum capacity at fixed sites to establish the scope for increased levels of production; in the interim, the partial data available indicates that the existing fixed recycling sites have substantial spare capacity to cater for increased demand.

5. USES OF DEVON'S AGGREGATE RESOURCES

5.1 Aggregates are used for a wide range of construction uses, with concrete (both ready-mixed concrete and the manufacture of concrete products) and road construction and maintenance being the major uses for Devon's land-won and secondary aggregates. Other uses include mortar, armourstone, rail ballast and constructional fill.

5.2 As explained in more detail in British Geological Survey (2007), an aggregate's suitability for a specific use is dependent on its physical and mechanical attributes, including strength, durability, porosity, particle shape, presence of impurities and abrasion resistance. The desired combination of these qualities will vary between different uses, with the most stringent specifications for structural concrete and road surfacing only capable of being met by a limited range of aggregate resources. For lower-specification uses, requirements can be met by a wider range of materials including secondary and recycled aggregates.

5.3 In addition to the relative physical properties, the choice of aggregate to be used for a particular purpose will also be influenced by matters such as ease of working and the proportion of waste generated, together with economic factors including proximity of the resource to markets (influencing transport costs), fiscal measures such as the Aggregates Levy, and the compliance of alternative aggregates with technical standards.

5.4 The four-yearly Aggregate Minerals surveys collect data on the uses for which land-won, marine-dredged and secondary aggregates are sold, although information is only available for aggregates produced in Devon and not for the aggregates imported into the county from elsewhere in the UK.

5.5 The information from the AM2009 survey is presented below separately for land-won sand and gravel, crushed rock and secondary aggregates produced in Devon in 2009, with Figure 5.4 summarising the use of land-won and secondary aggregates. No breakdown is provided for Devon's marine sand and gravel as it was all used for concrete in 2009.

Figure 5.1: Uses of Devon's Land-won Sand & Gravel, 2009

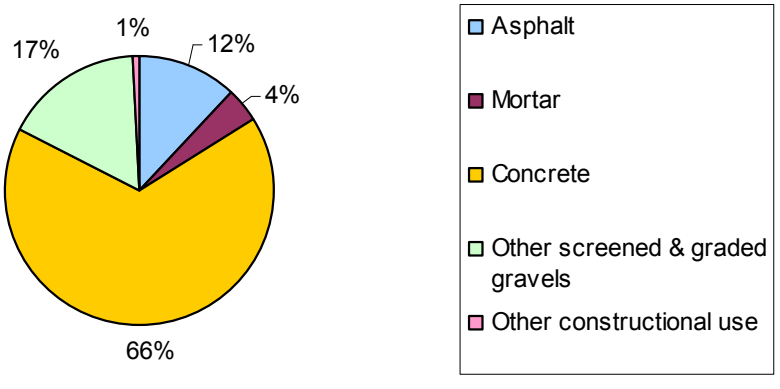


Figure 5.2: Uses of Devon's Land-won Crushed Rock, 2009

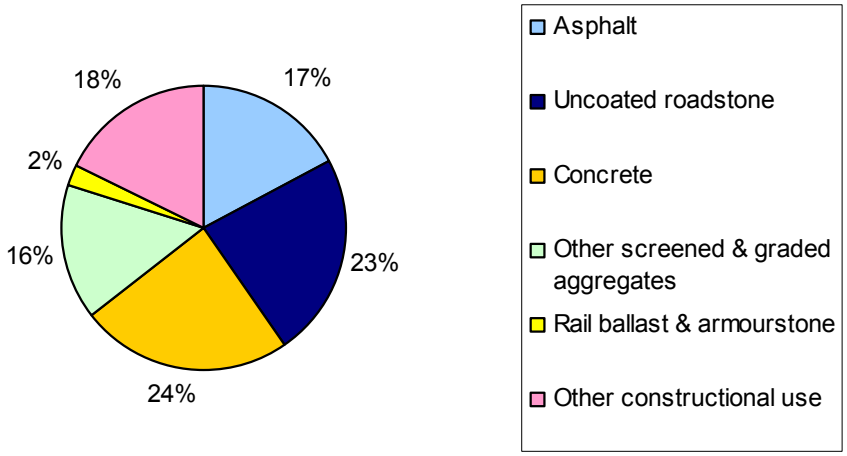


Figure 5.3: Uses of Devon's Secondary Aggregates, 2009

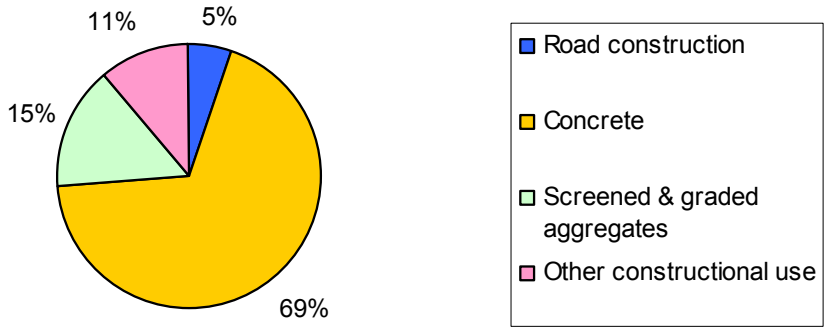
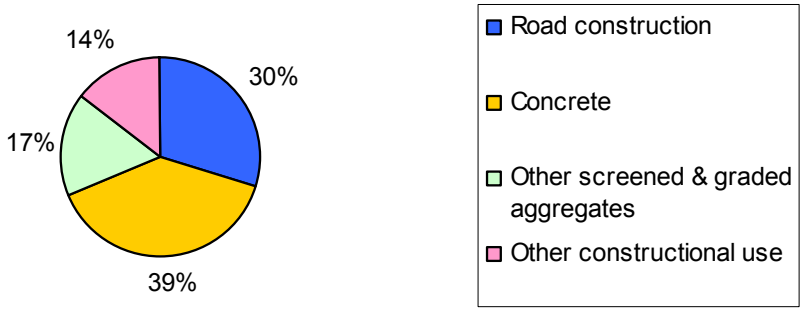


Figure 5.4: Uses of Devon's Land-won & Secondary Aggregates, 2009



5.6 These breakdowns illustrate the proportionately greater use of crushed rock for road construction and surfacing materials, although the total quantity of crushed rock used in concrete is greater than the contribution from sand and gravel. Use of aggregates for "other constructional" purposes, typically for fill materials, is much greater for crushed rock and secondary aggregates than for sand and gravel, suggesting the latter tends to be limited to use in higher-value products.

5.7 The categories used in the Aggregate Minerals survey do not include the use of gravel as uncoated roadstone (which will be recorded under "other screened and graded gravels"), preventing identification of the contribution of the Budleigh Salterton Pebble Beds' quartzite fraction to surface dressing materials.

5.8 Devon's secondary aggregates were used predominantly in concrete in 2009, replacing either sand and gravel or crushed rock resources, with use in road construction more limited.

5.9 No information is available on the uses for which Devon's recycled aggregates were utilised. Research at the national level [WRAP (2006), Mankelow *et al* (2008)] suggests that, while recycled aggregates have tended to be used for low-grade purposes such as constructional fill, they are increasingly being used for more demanding functions including road sub-base and concrete. However, the research suggests that the limit to the use of recycled and secondary aggregates is being approached.

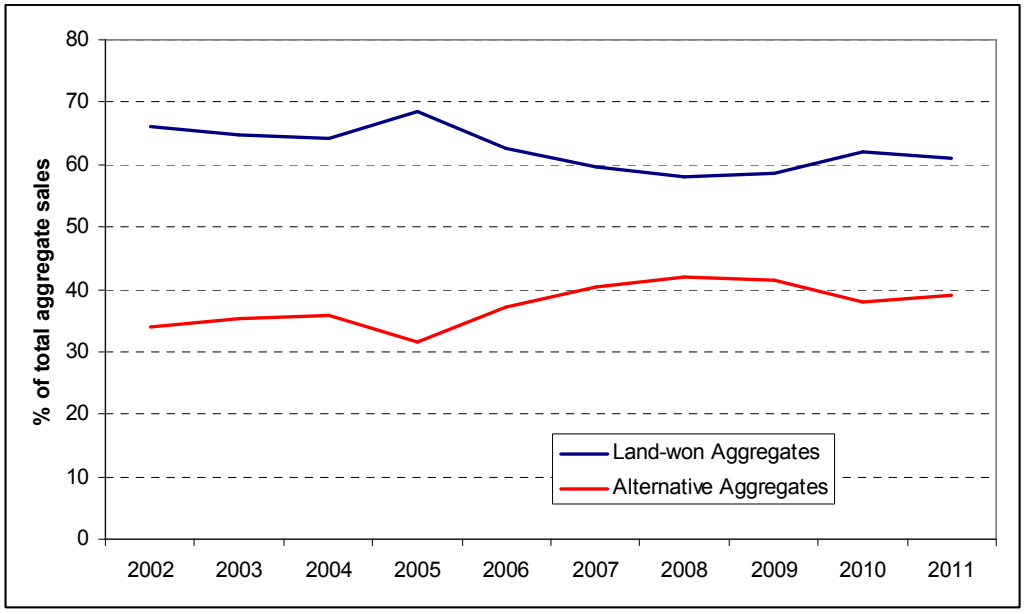


Figure 5.5: Relative sales of land-won and marine/alternative aggregates in Devon, 2002-2011

5.10 Figure 5.5 illustrates the relative shares of total aggregate sales for land-won and marine/alternative aggregates over the past ten years. The generally downward trend in the market share of land-won aggregates is mirrored by the upward trend for marine/alternative aggregates, although 2009-2010 saw a decline in the share of the latter (the peak in land-won aggregates in 2005 was due to a one-off increase in crushed rock sales to deliver major highway schemes in that year). It should be noted that the contribution of recycled

aggregates to the total sales of alternative aggregates is based on estimated figures developed from national data as explained in Appendix A, and the reliability of these figures is therefore qualified.

5.11 The general trends shown in Figure 5.5 suggest an increasing level of substitution of land-won aggregates by alternative aggregates, albeit at a gradual rate, supporting the aim of the Aggregates Levy. The scope for this substitution to maintain an upward trend, thereby reducing consumption of land-won aggregates, will be influenced by the factors identified in 5.2 and 5.3. Figure 3.3, illustrating the relative share of land-won aggregate sales, suggests a gradual increase in substitution of sand and gravel by crushed rock.

5.12 Within Devon, there is potential for increased substitution between the different types of aggregate, including the use of crushed rock fractions instead of sand and gravel, as well as secondary and recycled aggregates replacing land-won sand, gravel and crushed rock. However, it would be unwise to assume that full substitution of one resource by another is feasible, or always desirable, as technical requirements may constrain this. One example of the implications of substitution of aggregates is that secondary aggregates from china clay waste require an increased level of cement when used in concrete than is the case with land-won aggregates [British Geological Survey (2007)]. A further example is that, while secondary and recycled aggregates are capable of being used in road sub-base, they do not possess the resistance to polishing required for the surface layer.

5.13 In addition, the limited spatial occurrence of some resources, such as secondary aggregates (the major proportion of which are derived from the china clay operations near Plymouth) would result in increased transport costs (both financial and environmental) if they were to be substituted for land-won resources that are located closer to areas of demand in other parts of Devon.

5.14 Paragraph 3.18 highlighted that the land-won sand and gravel landbank in Devon did not extend to the 2031 end date of Devon County Council's Minerals Plan, suggesting a shortfall in supply during that period. Since 85% of Devon's land-won sand and gravel supply is derived from the Budleigh Salterton Pebble Beds (paragraph 3.6), it is useful to consider the scope for substitution of that resource by other aggregates available within Devon.

5.15 Information from the minerals industry [Devon Stone Federation (2012)] highlights the particular qualities of the Pebble Beds resource:

> *The extracted mineral is crushed and the resulting constituents are blended in a controlled manufacturing process to provide exactly what is required to comply with the various EN standards required by markets which include concrete and concrete screeds, Hot Rolled Asphalt, Asphaltic Concrete and building sands…The pebble beds provide a consistent feed both in terms of grading and geological makeup with >95% of the extracted mineral being quartzite.*
>
> *The quartzite aggregate of the pebble beds has a significantly lower water absorption than its competitors due to its uniform mineralogy, overall grading and grain shape, lack of composite grains and lack of mica, making it a much more efficient and durable material than other*

local aggregates, especially when used in Asphalt materials. It has proven to provide excellent skid resistance when used in surface course applications and this material will outperform most other aggregates available within the South West.

Furthermore, due to the sharp and hard nature of the quartzite mineral from the pebble beds, the grit material that is produced from the manufacturing process is the only material that Devon County Council has approved and specified for the gritting of SMA [Stone Mastic Asphalt] on Devon's road network.

5.16 Of the potential alternatives to this resource, the Devon Stone Federation advise that china clay secondary aggregates have a more limited grading (biased in the 2-4mm size fraction), together with a more variable mineral make-up and weathering. One outcome of these properties is the increased water demand and proportion of cement required in concrete.

5.17 Another alternative resource, crushed rock fines, are also considered to be gap-graded, for which rebalancing to match product grading would result in significant volumes of unusable waste. While better in terms of water absorption than china clay aggregates, this is still a significant factor for crushed rock fines.

5.18 The information provided by the Devon Stone Federation has been verified by Devon County Council's Materials Laboratory, which also advises that quartzite from the Pebble Beds has been trialled and approved for use in high friction surfacing. When used as a surface dressing aggregate (8mm through grade), the quartzite achieves an effective PSV of 60-64, reducing Devon's reliance on gritstone imported from elsewhere in the UK.

6. AGGREGATE MOVEMENTS

6.1 This Chapter considers two aspects relating to the movement of aggregates: firstly, the pattern of movements of aggregates between Devon and other parts of the UK and, secondly, the means by which aggregates are transported within and beyond Devon, including the use of rail and sea.

Pattern of Aggregate Movements

6.2 Information on the destinations of aggregates sold from Devon's quarries, together with the quantities of aggregates imported into the county, is available for 2009 from the AM2009 aggregates survey. Broadly speaking, Devon is relatively self-sufficient in aggregates with lower levels of imports and exports than many other counties.

6.3 Table 6.1 provides details of the destinations of land-won, secondary and marine aggregates sold from Devon's quarries and wharves in 2009. Around 87% of land-won and secondary materials remained in Devon, with most of the 'exported' materials being sold to markets within the South West region (all but 0.4% to the adjoining counties of Somerset, Cornwall and Dorset). No information is available on the destination of recycled aggregates produced in Devon, but it would be reasonable to assume that these low-value products largely remained within the county.

Resource		Total	Devon	Cornwall, Dorset & Somerset	Rest of South West Region	Outside South West Region
Sand and Gravel	Mt	0.48	0.43	0.04	<0.01	Negligible
	%		89.8	8.6	1.4	0.2
Crushed Rock	Mt	1.73	1.49	0.19	0	0.05
	%		86.4	10.9	0	2.8
Secondary Aggregates	Mt	0.38	0.34	0.02	<0.01	0.01
	%		88.3	5.4	0.8	3.3
Marine Aggregates	Mt	C	C	C	C	C
	%		99.7	0.2	0.1	0

Table 6.1: Destinations for land-won and secondary aggregates from Devon, 2009 (Mt = million tonnes; C = confidential)

6.4 The AM2009 collation report [Mankelow *et al* (2011)] also identifies that Devon 'imported' 93,000 tonnes of land-won sand and gravel and 426,000 tonnes of crushed rock in 2009 from elsewhere in England and Wales. For land-won sand and gravel, virtually all of the imported materials originated from elsewhere within the South West region, while for crushed rock 89% of the imported materials were from the South West region with the remaining 11% being from a range of locations in England and Wales with a small quantity from elsewhere.

6.5 Discussions with other MPAs and the minerals industry provide some further detail on cross-boundary flows of aggregates within the constraints of commercial confidentiality:

- the main destinations for the relatively small quantities of sand and gravel and crushed rock aggregates exported from Devon are Somerset (mainly the south west of the county around Taunton) and, to a lesser extent, Cornwall;

- the main destinations for secondary aggregates from Devon are Cornwall (most likely the eastern part of the county in the light of the availability of substantial secondary aggregate resources in the St Austell area) and Somerset;

- much of the sand and gravel imported into Devon is likely to have originated in Dorset, which has an operational quarry located close to the eastern boundary of Devon (see Figure 6.1) in an area of the latter where there no operational quarries;

- the substantial quantity of crushed rock aggregates imported into Devon is partly due to an absence of quarries producing the highest specification aggregates, with Cornish quarries close to the boundary with Devon being the main source (see Figure 6.1), supplemented by imports from elsewhere in England and South Wales; in addition, limestone from the Mendips is transported by rail to Exeter.

6.6 Adjoining counties provide marine aggregates through landings at Poole (Dorset) and Dunball, near Bridgwater (Somerset). The AM2009 collation report indicates that, while 94% of the 32,000 tonnes landed at Dunball was sold to destinations within Somerset, only 44% of the 78,000 tonnes landed at Poole stayed within Dorset, with 34% going elsewhere in the South West (although this is unlikely to include Devon) and 22% to destinations outside the region.

6.7 Movement of aggregates between quarries and markets within Devon is wholly by road due to the short distances involved and the general lack of suitable rail infrastructure at quarries. However, there are examples of the use of rail and water for aggregate transport to and from the county (locations indicated in Figure 6.1):

- Meldon Quarry is rail linked and, prior to its mothballing in 2011, its output of rail ballast was transported by rail;

- wharves in Plymouth are used for the shipping of limestone from Moorcroft Quarry, secondary aggregates from china clay operations and ball clay and china clay minerals and, on occasion, aggregates from Cornwall, together with inward movements of land-won aggregates;

- secondary aggregates in the form of blast furnace slag are imported through Teignmouth Docks; and

- limestone from Whatley Quarry in Somerset is brought by rail to Exeter for local sale.

6.8 The AM2009 survey indicates that crushed rock aggregates from Devon transported by rail (from Meldon) or water (from Plymouth) amounted to 5% of total sales. Just under 1% of secondary aggregates were transported by sea, but no sand and gravel was moved by either sea or rail.

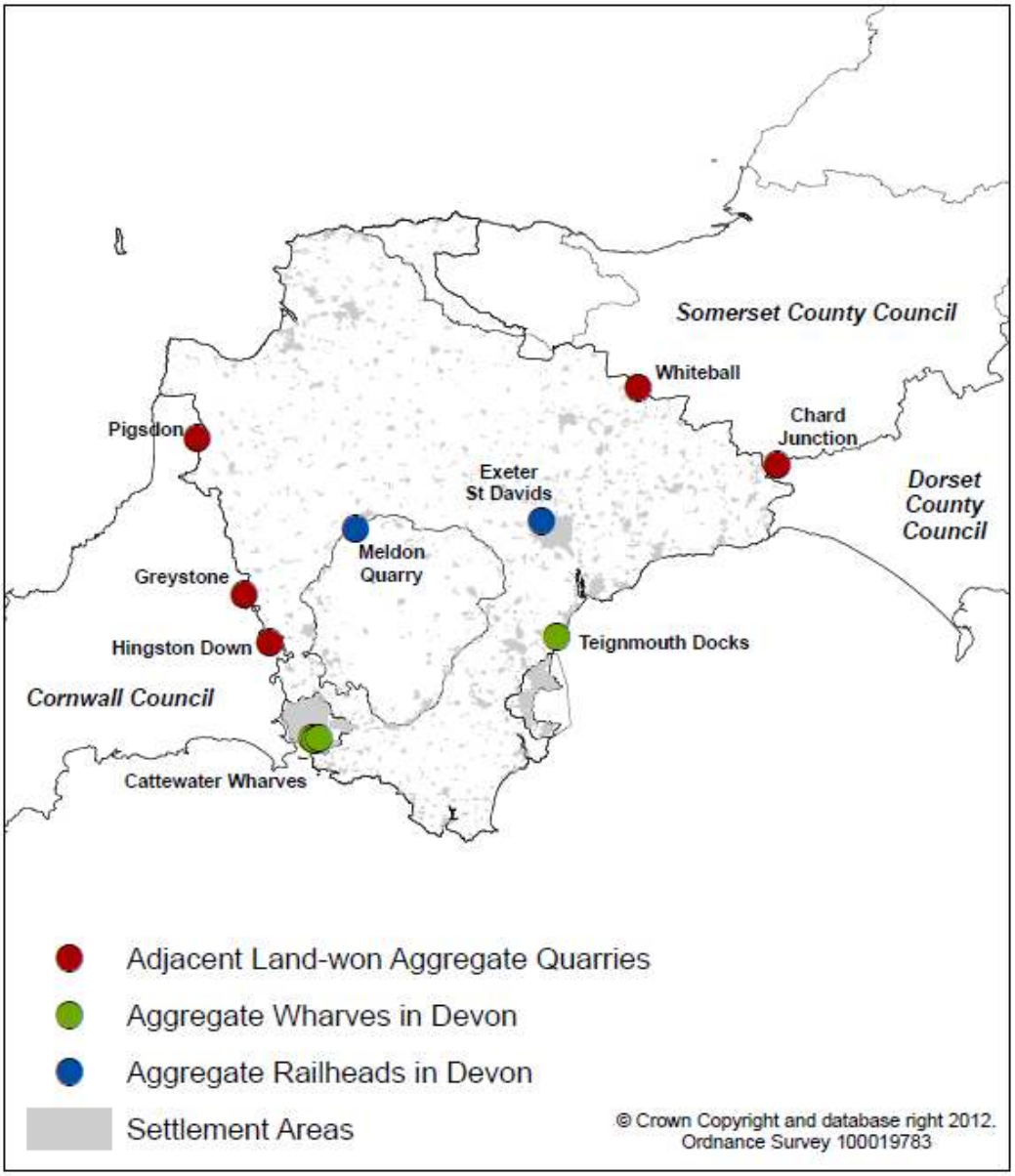


Figure 6.1: Aggregate Transportation Infrastructure in Devon and Location of Nearby Aggregate Quarries

Port Capacity

6.9 As indicated above, Devon's ports are used for the inward and outward movement of aggregates and other minerals, and consideration is given below of their operational characteristics. Much of the information is drawn from evidence commissioned by Plymouth City Council and partners [Atkins (2010)].

6.10 Victoria Wharf, Plymouth: the main facility in Plymouth for the export of china clay, which handles around half of Port of Plymouth's total dry bulk cargo throughput. The wharf has extensive open and covered storage and handling facilities, but scope for expansion is limited by adjacent development.

6.11 Cattedown Wharves, Plymouth: the main use is for petroleum, biofuels and animal feeds, but the wharf also handles aggregates (including imports from Ireland), ball clay and china clay. The level of dry goods handled has

dropped off, but investment has been made into new warehousing capacity. A rail connection to the wharves has been mothballed and may be removed.

6.12 Pomphlett Jetty, Plymouth: operated by Bardon Aggregates for the export of limestone from its nearby Moorcroft Quarry, together with aggregates from its other operations including Greystone Quarry in Cornwall and at Lee Moor (secondary aggregates). Recent annual shipped tonnage of 100,000 tonnes of limestone is half the level exported in the early 1990s, suggesting adequate spare capacity.

6.13 Information on the quantities of aggregates and other minerals handled at the Cattewater wharves (Victoria, Cattedown and Pomphlett) is provided in Table 6.2, and shows the significance of the aggregate and other mineral trade.

Product	2004	2005	2006	2007	2008	2009
Aggregates	191,231	141,532	172,670	220,377	222,820	150,670
Clay	400,234	426,366	475,746	446,037	376,810	234,227
Cement	12,694	26,657	40,301	40,657	59,104	55,920
Other	225,149	240,096	249,054	220,096	216,610	207,136
Total Dry Goods	829,308	834,651	937,771	927,167	875,344	647,953

Table 6.2: Quantity of mineral goods handled by Cattewater wharves, Plymouth, 2004-2009

6.14 The Port of Plymouth Evidence Base Study provides the following overview of the use of the Cattewater wharves for mineral goods.

Commodity	Direction	Market	Outlook
Clay	Outward	Europe (Spain)	Declining
Aggregates	Outward	Channel Islands, SE England	Stable
Aggregates	Inward (Ireland)	Local/regional	Stable
Cement	Inward (Germany)	Local/regional	Growing

Table 6.3: Markets for minerals handled at Cattedown wharves, Plymouth

6.15 Teignmouth: ball clay and some china clay account for most of the 350,000 tonnes exported from the port. The 270,000 tonnes of imported goods includes blast furnace slag from Port Talbot for use as a cement additive. Substantial investment has enhanced the cargo-handling facilities, but the depth and alignment limits the size of ship that can be accommodated.

6.16 Bideford Quay: small facility used for the export of ball clay alongside general goods. No storage facilities available, and location within a Conservation Area limits scope.

6.17 Appledore: three wharves have been used for the landing of sand and gravel dredged in the Bristol Channel, with materials either loaded direct onto lorries or stockpiled.

6.18 Yelland Wharf: built to unload coal for a now-demolished power station, the wharf has had planning permission for the import and export of minerals and construction of storage facilities, but this has not been implemented and has therefore lapsed.

Rail Infrastructure

6.19 The viability of using rail for the transportation of aggregates tends to be limited to the movement of materials in bulk on an inter-regional basis, with examples being major crushed rock quarries in Somerset and Leicestershire supplying markets in the South East of England. In Devon, the relatively small output of its quarries, the distance to major markets and presence of intervening supply areas such as the Mendips, and constraints with the county's rail infrastructure together limit the feasibility of transporting aggregates by rail.

6.20 Only one aggregates quarry in Devon – Meldon Quarry in Dartmoor National Park – is rail-linked, and this has supplied rail ballast for use in the south of England. The operator secured a variation to its planning permission to allow minerals from its operations elsewhere in Devon and Cornwall (including secondary aggregates) to be brought to Meldon by road for onward movement by rail. However, the quarry and railhead closed in 2011 and are currently being offered for sale.

6.21 A handful of currently-operational aggregates quarries have been rail-linked in the past, but these would require varying levels of work to reconnect them to the rail network:

- Westleigh Quarry was served by a short rail line from the main Exeter to Taunton line, but this link was been removed by the 1950s;
- Stoneycombe Quarry is adjacent to the main Exeter to Plymouth line and was been served by a siding until at least the 1950s; and
- Trusham Quarry is located adjacent to the former Teign Valley rail line that closed in 1968, with the quarry being served by sidings.

6.22 Devon currently has one rail depot used for the importation of aggregates from outside the county, with Hanson transporting limestone from their Whatley Quarry in Somerset to Exeter St Davids.

6.23 Of the non-aggregate mineral resources that yield secondary aggregates from their waste, only the ball clay resource in the Bovey Basin has the potential for being rail-linked. The Heathfield branch line north west of Newton Abbot has been used in the past for transportation of ball clay, and is currently used for the outward movement of waste timber, and could potentially be used for the transportation of ball clay sand. However, the small quantities of these secondary aggregates that are currently produced would limit the viability of movement by rail.

7. FUTURE AGGREGATES SUPPLY

7.1 The National Planning Policy Framework requires that a LAA be "based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine, secondary and recycled sources)". It is anticipated by the NPPF that MPAs will make provision for the land-won and other aggregates sources identified in their LAA in their minerals plan.

The Future Context

7.2 Future demand for aggregates as a whole will be influenced by two main factors:

- the future level of construction activity, including new development and maintenance of existing infrastructure in Devon (and, to a more limited extent, in adjoining areas served by Devon's aggregate producers); and
- the intensity of aggregate use in construction activity, including the extent to which aggregates are replaced by other materials such as timber, steel and glass.

7.3 Forecasts produced by Devon County Council indicate that the county's population is likely grow from 1,155,600 in 2011 to from 1,291,200 in 2031, an increase of 11.7%. Accommodating this forecast population increase, together with associated employment and other development and infrastructure, will be achieved through development planned for by Devon's district, unitary and national park authorities. Figure 7.1 illustrates the location and scale of the main areas of housing development identified in Devon's Local Plans for the period to 2031.

7.4 The Government's guidance [DCLG (2012b)] suggests the use of the National Infrastructure Plan as part of the "relevant local information" used to supplement the 10 years sales data. The 2012 update of this Plan [HM Treasury (2012)] identifies one major infrastructure proposal within or close to Devon, the Kingskerswell Bypass (under construction, completion due 2015). Reference is also made to the award of funding for flood defences at Exeter.

7.5 In addition, the National Infrastructure Plan identifies general initiatives in fields including communications, waste and energy that may have implications for Devon. The National Infrastructure Plan will be monitored as an influence on demand for aggregates within Devon.

7.6 In addition to overall demand for aggregates, future supply requirements in Devon will be influenced by factors affecting the market share of the different streams available (i.e. land-won crushed rock and sand and gravel, and marine and alternative aggregates). These factors include:

- the influence of national fiscal measures such as the Aggregates Levy (the subject of ongoing legal challenge) and Landfill Tax;
- the procurement decisions of developers in specifying materials;

- the development of quality protocols for aggregates and their influence on perceptions of alternative aggregates;
- the costs of transporting alternative aggregates to markets more distant from their area of production; and
- the extent to which it is technically feasible to substitute one aggregate stream for another.

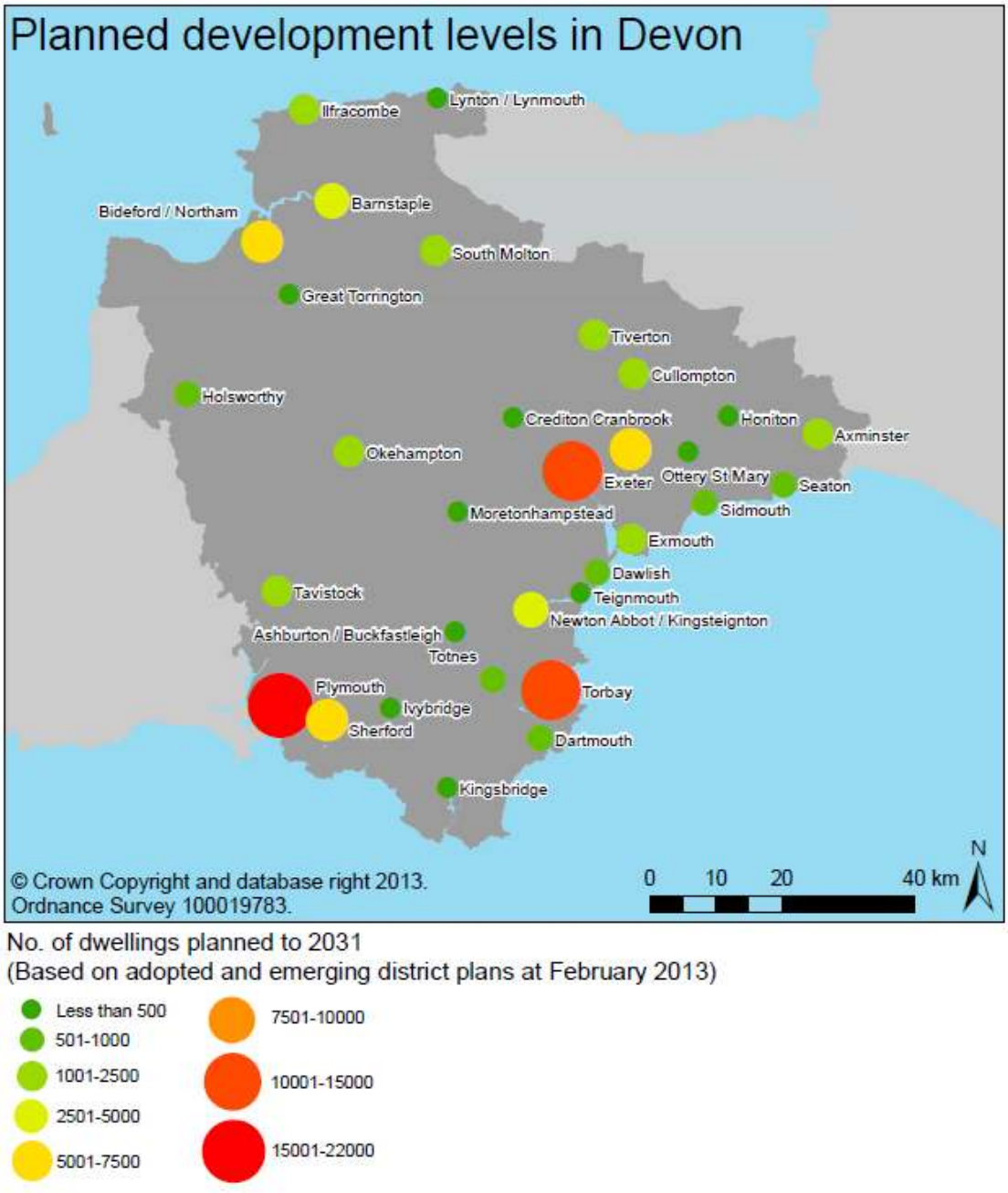


Figure 7.1: Planned housing development levels in Devon to 2031

7.7 The range of factors identified above indicates that it would be difficult to accurately model future demand for aggregates at the county level as a refinement of the basic ten year average, particularly as some of these factors are not easily quantifiable. Instead, the responsiveness of the LAA to changing trends in construction activity and aggregate use is enhanced

through the use of weighted averages of the past 10 years of sales for each aggregate stream (see Appendix A), while the scope for the maintenance and, if warranted by future demand, enhancement of this level of production is assessed below.

Land-won, Marine and Alternative Aggregates Supply

7.8 Preceding chapters have presented data on past sales of land-won aggregates and alternative sources, and Table 7.1 collates the weighted 10 year average sales for the different streams of aggregates supply in Devon between 2002 and 2011.

Aggregate stream	10 year weighted average sales (million tonnes)	% of total sales
Land-won Crushed Rock	2.28	48.6
Land-won Sand & Gravel	0.61	13.0
Marine	0.05	1.1
Secondary	0.50	10.7
Recycled	1.25*	26.6
Total	4.69	

Table 7.1: Weighted Annual Average Aggregate Sales 2002-2011 (* estimated)

7.9 The ability for these levels of supply to be maintained for the Plan period to 2031, or to meet increased demand if it were to occur, is considered below for individual aggregate streams.

Land-won Crushed Rock

7.10 As indicated in Table 3.4, all types of crushed rock resource (i.e. limestone, sandstone and igneous/metamorphic rock) have landbanks in excess of 50 years, indicating that not only can recent levels of production be maintained, but significant increases in output could be accommodated if warranted by demand. However, there is limited supply of high-specification aggregates from quarries within Devon, resulting in a need to import these materials from elsewhere in the UK, and this is an issue to be addressed by Devon County Council in its Minerals Plan.

Land-won Sand and Gravel

7.11 Table 3.3 identifies the quantity of permitted reserves of land-won sand and gravel at the end of 2011 as 9.16 million tonnes which, using the weighted ten year average sales of 0.61 million tonnes in Table 7.1, provides a landbank of 15.0 years. This landbank does not extend to the 2031 horizon of Devon County Council's Minerals Plan, indicating a potential need for this Plan to provide for further sand and gravel resources if the minimum landbank of seven years is to be maintained to 2031, subject to monitoring through future iterations of the LAA.

7.12 While continuation of the recent downward trend in sales of sand and gravel will have the effect of lowering the rolling ten year average and therefore extending the length of the landbank, any future increase in demand for land-won sand and gravel would conversely have the effect of shortening the landbank further.

7.13 Two further issues concerning future supply of land-won sand and gravel identified in Chapter 3 that will require monitoring by Devon County Council are:

- the renewal or otherwise of the planning permissions identified in Table 3.5 that are due to expire in the early part of the Plan period, together with the potential for permissions to lapse in the event of non-submission of schemes required under Schedule 14 of the Environment Act 1995; and

- the relationship between the distribution of sand and gravel reserves and the approach to be pursued in Devon County Council's Minerals Plan to the spatial pattern of aggregates supply.

Marine Aggregates

7.14 Comparison of actual and licensed rates of dredging within the Bristol Channel indicates that there is scope for a significant increase in the volume of marine sand and gravel to be achieved. Provided that wharves in North Devon remain available for the landing of dredged materials, the maintenance of the recent level of supply or a significantly increased level of up to double the rate identified in Table 7.1, appears to be achievable.

Secondary Aggregates

7.15 The continued or increased supply of secondary aggregates through the processing of waste arising from Devon's resources of china clay, ball clay and slate is dependent on the continued availability of the source materials. While the china clay operations at Lee Moor that supply the bulk of Devon's secondary aggregates have contracted in recent years, they remain a source of 'as dug' waste that is being supplemented through the excavation of previously-tipped waste. Working of ball clay in the Bovey Basin remains buoyant, while the small slate quarry at Mill Hill has extensive waste tips that can be re-worked to supplement waste from building stone processing.

Recycled Aggregates

7.16 As indicated in paragraph 4.20, the level of supply of recycled aggregates is influenced by the volume of arisings of CDEW and the proportion of this waste that is recycled for aggregate use. A potential constraint on increased production is the availability of adequate capacity at recycling facilities located in close proximity to sources of CDEW and markets for the recycled aggregates derived from that waste.

7.17 The limited information available suggests that Devon's fixed CDEW recycling facilities have adequate capacity for current and potentially greater levels of recycled aggregates production. Figure 4.4 indicates that the distribution of these sites reflects the location of the major population centres in Devon that will be the sources of CDEW and markets for the aggregates produced.

Transportation Infrastructure

7.18 Evidence in Chapter 6 suggests that wharves in Plymouth have adequate spare capacity to cater for any increase that may occur in the use of the port for inward or outward movement of aggregates by sea, particularly with the

declining trade in china clay. The availability of these wharves, together with others in Devon that handle or could handle aggregates, should be safeguarded through relevant MPA's Minerals/Local Plans. Similarly, the railheads currently or recently used for the limited volumes of aggregates transported to and from Devon by rail should be safeguarded to maintain their potential.

Implications for Individual Mineral Planning Authorities

7.19 As indicated in paragraph 1.3, each of Devon's MPAs is providing its own minerals planning policy, either as part of its Local Plan or through a 'stand alone' Minerals Plan. Since the distribution of mineral resources and supporting infrastructure across Devon is uneven, not all of the requirements for future provision arising from this LAA are relevant to each of the five MPAs. Table 7.2 therefore provides a summary of the issues identified above and identifies the MPA(s) to which each is relevant.

Issue (■ – issue is of relevance to MPA)	**Dartmoor**	**Devon CC**	**Exmoor**	**Plymouth**	**Torbay**
Safeguarding of crushed rock reserves and processing capacity	■	■		■	
Provision for further supply of high-specification crushed rock aggregates		■			
Safeguarding of sand & gravel reserves and provision for further resources		■			
Safeguarding of wharf capacity for marine aggregates		■			
Maintaining availability of resources and processing capacity for secondary aggregates		■			
Maintaining processing capacity for recycled aggregates	■	■		■	■
Safeguarding of infrastructure for movement of aggregates by rail or sea	■	■		■	

Table 7.2: Implications of the Local Aggregate Assessment for Devon's MPAs

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APPENDIX A: DATA COLLECTION AND METHODOLOGY

Land-won Aggregates

A.1 Data for annual sales of land-won aggregates are obtained by Devon County Council directly from the mineral operator for each site, either through provision of a copy of their Annual Minerals Raised Inquiry [AMRI] form or through provision of equivalent figures. Figures for permitted reserves are also obtained directly from the operators.

A.2 Each four years (most recently for 2009), the Government's Aggregate Minerals survey is undertaken, with MPAs responsible for collecting data in their area and forwarding it for collation at regional and national level. This survey includes data on the destinations of land-won aggregates by county, together with the mode of transport.

A.3 The Government publishes its collation of the AMRI forms submitted by mineral operators, with figures provided at the county level. However, there are two key issues that limit their usefulness as an alternative source of data:

- figures for crushed rock aggregates have been presented separately for sandstone, igneous rock and limestone, with one of these often being confidential, thereby preventing calculation of a total figure for Devon crushed rock; and
- as well as including marine-dredged materials (with this element often kept confidential), figures for sand and gravel differ significantly from those obtained by Devon County Council from mineral operators, as indicated in Figure A.1. This Figure also shows the secondary aggregates sales collected by Devon County Council, and it is considered likely that some elements of secondary aggregate sales are being included as land-won aggregates in AMRI returns.

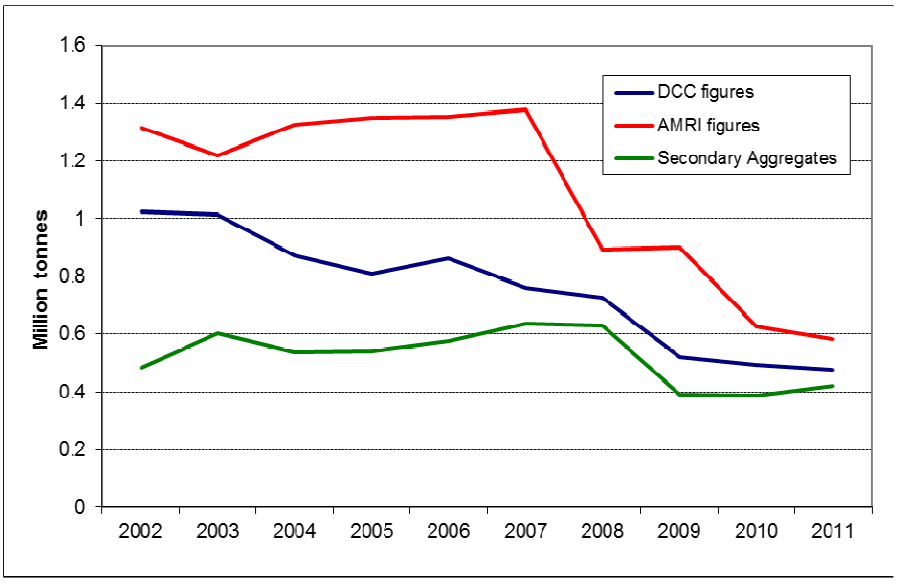

Figure A.1: Comparison of AMRI and Devon County Council Sand and Gravel Data (including marine aggregates), 2002-2011

A.4 The rise in secondary aggregate sales from 2004 to 2007, at a time when sales of land-won sand and gravel were generally declining according to the County Council's figures, may explain the upward trend at that time in the AMRI sand and gravel sales figures.

Marine Aggregates

A.5 Data for marine aggregates landed at wharves in Devon are obtained from the mineral operator. Although figures for Devon are sometimes included in the AMRI collation reports[16], these appear to significantly underestimate those obtained from the operator.

Secondary Aggregates

A.6 Figures for sales of secondary aggregates (from the extraction and processing of china clay, ball clay and slate) are obtained from the relevant mineral operator. As mentioned above, the status of secondary aggregates within the AMRI collation is unclear.

Recycled Aggregates

A.7 Figures for sales of recycled aggregates produced at national and regional levels are heavily qualified as there is no systematic and consistent data collection equivalent to the AMRI or Aggregate Minerals surveys. Robust and consistent data on sales of recycled aggregates at the county level are difficult to obtain due to the diversity of recycling facilities and their frequently temporary nature. However, periodic surveys undertaken on behalf of the Government provide regional data that, combined with assumptions about the proportions accounted for by Devon, allow estimates to be made.

A.8 Table A.1 provides a summary of the national, regional and estimated Devon figures for arisings of CDEW and production of recycled aggregates.

	2001	2003	2005	2008	2009	2010
England CDEW	88.89	90.93	89.63	94.54	77.00	77.37
England Rec. Aggs	36.47	39.60	42.07	43.52	34.82	34.82
England Recycled Aggs as % of CDEW	41.0	43.5	46.9	46.0	45.2	45.0
SW CDEW	11.94	10.01	9.48	10.02*	8.16*	8.20*
SW CDEW as % of England	13.4	11.0	10.6	10.6*	10.6*	10.6*
Devon CDEW	3.62*	3.03*	2.87*	3.04*	2.47*	2.48*
Devon Recycled Aggregates	1.48*	1.31*	1.35*	1.40*	1.12*	1.12*

Table A.1: Arisings of Construction, Demolition and Excavation Waste and Production of Recycled Aggregates, 2001-2010 (million tonnes)[17]

* Estimated figure

A.9 In estimating figures for Devon, the following assumptions have been made:

[16] Available at: http://www.communities.gov.uk/planningandbuilding/planningbuilding/planningresearch/researchreports/mineralswasteresearch/annualmineralsraised/

[17] Data obtained from periodic surveys of CDEW: ODPM (2002); ODPM (2004); DCLG (2007); WRAP (2010) and Defra (undated).

- as no regional figures have been provided from 2008, it is assumed that the South West accounted for the same proportion of England's CDEW arisings from 2008 as in 2005;

- as CDEW input at licensed waste management facilities in Devon in 2008 amounted to 30.3% of the total for the South West region[18], it has been assumed that 30.3% of the region's arisings of CDEW occur within Devon; and

- the proportion of Devon's CDEW that is recycled as aggregates is consistent with the proportion for England, as these figures provide a more consistent and less erratic trend than the (incomplete) South West figures, and are therefore considered to be more reliable.

A.10 The two main trends that can be detected in the estimated figures for Devon are:

- broadly downward rates of total CDEW arisings, potentially reflecting more efficient site management practice that reduces the generation of waste, together with the 2008/2009 downturn in the economy and consequent reduction in construction activity; and

- the upward national trend in the proportion of CDEW that is recycled for aggregate use from 2001 to 2005, reflecting the fiscal measures of the Landfill Tax and Aggregates Levy, although this appears to have levelled off since 2005.

A.11 The net result of these contrasting trends is that production of recycled aggregates in Devon is estimated to have been relatively steady from 2001 to 2008, following which production has dropped in response to reduced availability of CDEW and reduced demand for aggregates generally.

A.12 To provide a ten year average for comparison with other aggregate streams, the figures in the final row of Figure A.2 have been adapted by assuming:

(a) a steady rate of change between years for which figures have been calculated (e.g. assuming that production of recycled aggregates in Devon in 2002 was the mean of the figures for 2001 and 2003, i.e. 0.955 million tonnes); and

(b) that production in 2011 continued at the annual rate for the previous two years.

A.13 These assumptions result in the following estimated figures for sales of recycled aggregates in Devon:

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1.39	1.31	1.33	1.35	1.37	1.38	1.40	1.12	1.12	1.12

Table A.2: Estimated Sales of Recycled Aggregates in Devon, 2002-2011

A.14 Research based on a 2005 survey [DCLG (2007)] suggested that 80% of recycled aggregates were produced at fixed recycling sites, with the

[18] See Devon County Council's Waste Core Strategy Evidence Base Report, available at http://www.devon.gov.uk/evidencebasereport.pdf

remainder at construction sites. However, subsequent initiatives in sustainable construction and the introduction of site waste management plans are likely to have increased the proportion of recycled aggregates derived from construction sites. A split of two thirds from fixed recycling sites and one third from construction sites is therefore proposed for the purposes of the LAA.

Weighting of Average Production Figures

A.15 A drawback of using a simple arithmetic mean (average) for a ten year period is that each year's figure is treated in the same manner as all other years'. This can result in the ten year average figure being unduly influenced by events or circumstances in the earlier part of that period, and changes in trends during the later part not fully influencing the average until the ten year period rolls forward one or more years. This is recognised in DCLG's October 2012 guidance [DCLG (2012b)] which suggests also considering an average of three years' sales when considering whether to increase supply.

A.16 Where the trend in aggregates production has generally been downwards, it can be argued that a simple average gives too much emphasis to the higher production levels in the earlier years and does not fully reflect the lower levels in the later years. It may also be the case that an upturn in production would not be properly reflected until the years with low levels work through the 'system'.

A.17 One method of overcoming this potential inertia would be to use a shorter period for calculating the averages, for example five years. However, this would risk averages being unduly influenced by atypical figures in one year, as well as being contrary to the requirement of the National Planning Policy Framework for assessments to be based on a rolling ten year average.

A.18 A more appropriate method is the use of a weighted ten year average, with greater emphasis given to the figures in later years than those earlier in the ten year period through the application of weightings to each year's figure. The most recent figure is multiplied by ten, the next most recent by nine etc., with the earliest figure in the ten year period being multiplied by one. The weighted figures for the ten years are totalled and divided by the sum of the weightings (55, i.e. 10+9+8+7+6+5+4+3+2+1) to provide the weighted ten year average. An example using figures for crushed rock sales over the period 2002-2011 is given below.

Year	**Annual Sales (Mt)**	**Weighting**	**Weighted Figure**
2002	2.85	1	2.85
2003	2.74	2	5.48
2004	2.70	3	8.10
2005	3.40	4	13.60
2006	2.60	5	13.00
2007	2.35	6	14.10
2008	2.24	7	15.68
2009	1.71	8	13.68
2010	2.08	9	18.72
2011	2.02	10	20.20
Simple Average	**2.47**		
Weighted Average (i.e. sum of final column/55)			**2.28**

Table A.3: Simple and Weighted Average Sales of Crushed Rock, 2002-2011

A.19 Using this method, all average figures in this Local Aggregates Assessment have been calculated as weighted averages. It is considered that this approach is consistent with DCLG's alternative of supplementing a ten year average with one for three years.

APPENDIX B: AGGREGATE FACILITIES IN DEVON

B.1 The table below provides details of the land-won aggregate quarries, processing facilities for secondary and recycled aggregates and facilities for transportation of aggregates within Devon that were operational during 2011, together with inactive aggregate quarries that retain permitted reserves[19].

Land-won Aggregate Quarries – Operational in 2011				
MPA	**Key[20]**	**Quarry**	**Operator**	**Mineral**
DCC	1	Bableigh Wood	D E & R Chance	Sandstone
DCC	2	Beam	Torrington Stone	Sandstone
DCC	3	Bishop's Court	Aggregate Industries	Sand
DCC	4	Blackhill	Aggregate Industries	Sand & Gravel
DCC	5	Bray Valley	Hanson	Sandstone
DCC	6	Hearson	G Horrell	Sandstone
DCC	7	Hillhead[21]	Aggregate Industries	Sand & Gravel
DCC	8	Knowle	Faheys Concrete	Sandstone
DNPA	9	Linhay Hill	E & J W Glendinning	Limestone
DNPA	10	Meldon	Aggregate Industries	Dolerite/Hornfels
PCC	11	Moorcroft	Aggregate Industries	Limestone
DCC	12	Newbridge	Newbridge Stone	Sandstone
DCC	13	Rockbeare Hill	Aggregate Industries	Sand & Gravel
DCC	14	Stoneycombe	Aggregate Industries	Limestone
DCC	15	Town Farm	Hanson	Sand & Gravel
DCC	16	Trusham	Hanson	Dolerite
DCC	17	Uplyme[22]	E & J W Glendinning	Sand & Gravel
DCC	18	Venn Ottery	Aggregate Industries	Sand & Gravel
DCC	19	Vyse	Braunton Aggregates	Sandstone
DCC	20	Westleigh	Aggregate Industries	Limestone
DCC	21	Zig Zag	Harleyford Aggregates	Sand & Gravel

Land-won Aggregate Quarries – Inactive in 2011			
MPA	**Quarry**	**Operator**	**Mineral**
DCC	Babcombe Copse	Hanson	Sand & Gravel
DCC	Beer	Hanson	Chalk
DCC	Bickley Ball	None	Limestone
DCC	Colpit	E & J W Glendinning	Sandstone
DCC	Haldon	RF Aggregates (SW)	Sand & Gravel
DCC	Hayne[23]	RWT Edworthy & Sons	Sandstone
DCC	Kersdown	Aggregate Industries	Limestone
DCC	New England	None	Dolerite
DCC	Palace	None	Limestone
DCC	Plaistow	Hanson	Sandstone
DCC	Tuckingmill	None	Sandstone

[19] Dormant quarries that would require the submission of a new scheme of working conditions prior to their reopening are omitted from the list.
[20] The key relates to Figure 2.1.
[21] Working in 2011 limited to sale of materials from stockpiles
[22] Aggregate working in 2011 limited to sale of materials from stockpiles (although extraction of chalk for agricultural use by another operator continued)
[23] The planning permission lapsed on 31 December 2011

DCC	Venn	Aggregate Industries	Sandstone
DCC	Whitecleaves	Gilpin Demolition	Dolerite

Secondary Aggregate Processing Facilities				
MPA	**Key**[24]	**Site**	**Operator**	**Resource**
DCC	A	Headon	Tarmac	China clay waste
DCC	B	Lee Moor	Aggregate Industries	China clay waste
DCC	C	Mill Hill Quarry	Mill Hill Quarries Ltd	Slate waste
DCC	D	Preston Manor	Sibelco	Ball clay sand

Recycled Aggregate Processing Facilities			
MPA	**Key**	**Site**	**Operator**
DCC	1	Bableigh Wood	D E & R Chance
DCC	2	Challonsleigh	Dorton Group
DCC	3	Coventry Farm	ABC Siddalls Skip Hire
DCC	4	Dittisham	D B Skips
DCC	5	Fosterville	Fosterville Ltd
DCC	6	Hayedown	The Sparling Group
DCC	7	Hill Barton	A E Stuart & Sons
DCC	8	Holmacott	John Coles Contractors
DCC	9	Johnsland	Okehampton & Crediton Skip Hire
DNPA	10	Linhay Hill Quarry	E & J W Glendinning Ltd
DCC	11	Little Stowford	Greenaways
PCC	12	Moorcroft Quarry	Aggregate Industries
DNPA	13	Pitts Cleave Quarry	R P & S Heywood Haulage Ltd
DCC	14	Stoneycombe Quarry	Aggregate Industries
DCC	15	Strashleigh Hams	Viridor
DCC	16	Trood Lane	B T Jenkins Ltd
DCC	17	Westleigh Quarry	Aggregate Industries
TC	18	Yalberton Tor Quarry	R F Aggregates
DCC	19	Yelland	Notts Contractors Ltd

Aggregate Transportation Facilities			
MPA	**Site**	**Mineral Operator**	**Facility**
DCC	Appledore Wharf	Hanson Marine	Wharf
PCC	Cattedown Wharf, Plymouth	Aggregate Industries	Wharf
DCC	Exeter St Davids	Hanson	Rail siding
DNPA	Meldon Quarry	Aggregate Industries	Rail siding
PCC	Middle Dock, Appledore	Hanson Marine	Wharf
PCC	Pomphlett Jetty, Plymouth	Aggregate Industries	Wharf
DCC	Teignmouth Dock	Hanson	Wharf

DCC Devon County Council
DNPA Dartmoor National Park Authority
PCC Plymouth City Council
TC Torbay Council

[24] The keys for secondary and recycled aggregate sites relate to Figure 4.4

APPENDIX C: RESPONSES TO CONSULTATION ON THE DRAFT LOCAL AGGREGATE ASSESSMENT

C.1 To meet the requirements of the NPPF, a draft of the LAA was submitted to the South West Aggregate Working Party [SWAWP] for their advice. The draft Devon LAA was discussed by SWAWP at its meeting on 14th December 2012, with the following advice being recorded in the meeting minutes:

> A "'brave' attempt to account for the 3 year sales average but wondered whether using weighted averages compromised the universal approach across the country…considered that the simple average of 10 years sales should be used unless local circumstance warranted an alternative approach and that there should be some debate on whether to use SRA figures or 10 year averages for allocations."

C.2 In addition to seeking the advice of SWAWP, the draft LAA was circulated to the Devon Stone Federation, representing some of the county's aggregate operators, together with the following community bodies that have questioned the need for aggregates provision in response to consultations on Devon County Council's emerging Minerals Plan:

- Ottery St Mary Town Council
- Burlescombe Parish Council
- Uffculme Parish Council
- Straitgate Action Group
- Ottery Quarry Action Group
- Culm Waste and Minerals Group

C.3 Comments were received from Devon Stone Federation, Straitgate Action Group and Culm Waste and Minerals Group, and these are summarised in Table C.1 together with Devon County Council's response.

Q1: Are the scope and level of detail within the Assessment appropriate?
Straitgate Action Group: Yes
DCC response: noted
Q2: Are there any additional sources of data available that you consider would enhance the Assessment?
Devon Stone Federation: Some notice should be made of the influence of projected consumption. The simplest way to do this is to take account of population figures. Some allowance should be included in the methodology to allow for increases in demand from both anticipated recovery and the additional demand from the population increase. Straitgate Action Group: None we are aware of Culm Waste & Minerals Group: Figures for exports and imports for years other than 2009. More information on cross border relationships. Actual sales in the two parts of the BSPB. Spatial pattern of sand and gravel sales and planning applications. Transport costs for aggregates.
DCC response: The draft LAA includes a figure for Devon's projected population growth over the Plan period (paragraph 7.3). The use of a ten year average that includes years of higher construction activity and aggregate production, rather than a shorter period that may be more biased towards the recessionary period, results in a level significantly above current production

levels that allows for increased demand. While an economic recovery is likely to lead to increased construction activity, increasing emphasis on sustainable construction may see increased use of materials other than aggregates, together with use of alternatives to land-won aggregates.

Data on movements of aggregates into and from Devon are gathered as part of the four-yearly AM surveys, and are therefore not available for the intervening years. The next AM survey is scheduled for 2013 (to be undertaken in 2014) and its outputs will be used in a future iteration of the LAA.

Chapter 6 provides data and discussion on cross-border relationships, with specific mention of Whiteball in paragraphs 3.23 and 3.24.

It is not possible to provide separate production figures for the northern and southern parts of the Budleigh Salterton Pebble Beds for reasons of commercial confidentiality.

While data are held by Devon County Council on the sales from individual quarries, these are commercially confidential and can only be published in an aggregated form. No information is available on the locations where aggregates are used, although this pattern will generally be similar to the distribution of major development. A map of planning applications within Devon would risk being too detailed, but consideration can be given to providing a map indicating the major housing and other development proposals contained in district/unitary authorities' Local Plans.

Q3: Does the Assessment contain any factual inaccuracies or omissions?

Straitgate Action Group: None we are aware of

DCC response: noted

Q4: Do you support the use of weighted 10 year averages as a more responsive indicator than a simple 10 year average of sales data?

South West Aggregate Working Party: A 'brave' attempt to account for the 3 year sales average but using weighted averages compromised the universal approach across the country. The simple average of 10 years sales should be used unless local circumstance warranted an alternative approach.

Devon Stone Federation: No. It is common knowledge that the country is experiencing a prolonged period of recession, with levels of construction, and house building in particular, notably lower than the long term average. The proposed weighting methodology distorts the overall 10 year period and accentuates the position in a recession, thus building in a weighted recessionary position going forward. The simple 10 year average negates this distortion.
The proposed / suggested weighting will have a material impact on the calculation of the sand and gravel landbank and provision figures during the plan period. It may also eventually impact on the crushed rock figures if continued into the long term.

Straitgate Action Group: Yes

DCC response: The weighted 10 year average is used as a method of increasing responsiveness to recent trends and reducing inertia caused by giving equal weight to more distant events. While this will result in a lower average over 10 years of reducing annual production than will be the case with a simple average, a weighted average may conversely give a higher figure than a simple average if production increases in future years.

The use of a weighted 10 year average is considered preferable to the 3 year average suggested in DCLG's MASS guidance, which runs the risk of reducing production levels to an artificial low at the current time. Using a weighted 10 year average is considered to provide the Devon MPAs with a stronger basis for resisting demands for use of a shorter period.

The NPPF and DCLG advice also refer to "other relevant local information" to

supplement the ten year average. As matters such as future construction activity, intensity of aggregate use and the contribution of alternative aggregates are difficult to quantify robustly, the use of weighted averages provides a mechanism to ensure that changing local trends are readily incorporated into the rolling average. It is accepted that no other MPAs in the South West or elsewhere are proposing the use of weighted averages for their LAA. However, other MPAs are using figures other than a simple 10 year average, including the Dorset MPAs and MPAs in the East of England region (the latter retaining use of their sub-regional apportionment). The approach suggested for Devon is still a 10 year average as required by the NPPF, and the weighting is not considered to prejudice the interests of other MPAs.
Any other comments
South West Aggregate Working Party: There should be some debate in the AWP on whether to use SRA figures or 10 year averages for allocations. Culm Waste & Minerals Group: Other counties allow working within AONBs, but Devon excludes this, limiting extraction to one part of the county. Working from river terrace and estuarine deposits should not be dismissed. Devon should encourage small operations across the county to increase competition and reduce transport distances. Existing reserves should be worked out before new resources, and operators should restore sites. Hinkley Point is unlikely to be supplied with minerals from the BSPB as most will arrive by boat. Consider the use of borrow pits to reduce road mileage and carbon footprint.
DCC response: Since the NPPF is clear on use of a 10 year average, it is not considered necessary for the AWP to debate the use of SRA figures instead. The additional comments raised by Culm Waste and Minerals Group are questioned in part, and are largely issues more relevant to the development of aggregates policies in the Minerals Plan rather than for the LAA.

Table C.1: Summary of Draft LAA Consultation Responses

C.4 The main issue of contention is the use of weighted averages but, for the reasons given in Table C.1, this method has been retained.