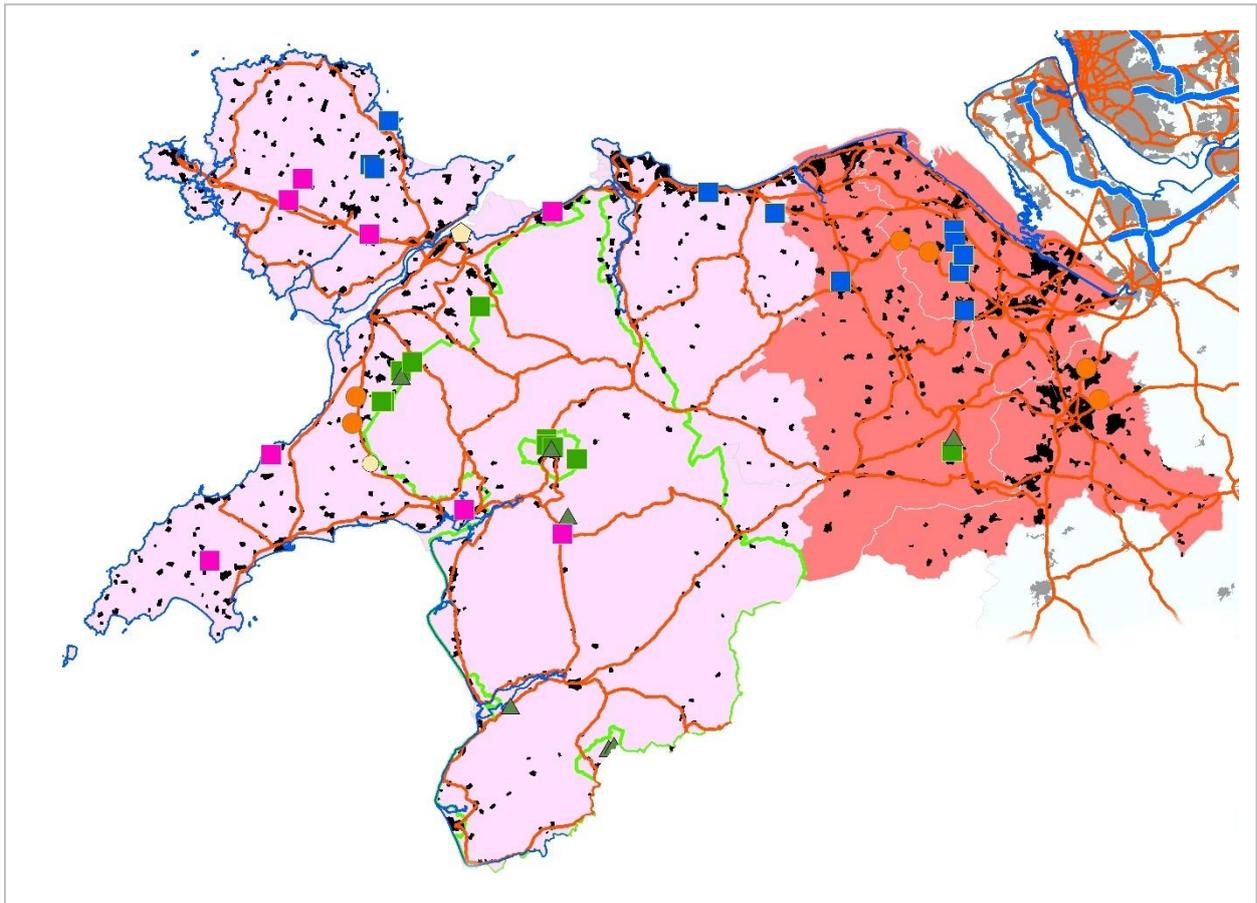


Regional Technical Statement (2nd Review)

Appendix A (North Wales)



Consultation Draft - September 2019

North Wales
Regional
Aggregates
Working Party



Llywodraeth Cymru
Welsh Government

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Appendix A: North Wales Region - Detailed Analysis & Recommendations

Introduction

- A1. This appendix is intended to complement, and should be read in conjunction with, the main document of the Second Review of the RTS. It provides additional explanation, specific to the North Wales Regional Aggregate Working Party (RAWP) Region, relating to the consideration of existing supply patterns, the detailed breakdown of sub-regional apportionments and requirements for new allocations. The final part of the Appendix, from paragraph A52 onwards, incorporates that information into specific recommendations and guidance for each individual Local Planning Authority (LPA).

Existing Supply Patterns in North Wales – Regional Overview

- A2. As explained in Chapter 3 of the main document, historical sales figures have been used in this review as a starting point for calculating the overall National requirement for land-won primary aggregate production in Wales, over the period covered by the revised RTS (i.e. 2020-2045). After applying a 30% uplift to reflect the planned increase in housing construction, this enhanced total has then been apportioned between North Wales and South Wales on the basis of their recent historical share of sales. The sub-regional apportionment of those regional figures has then been determined by looking carefully at the patterns of supply within each of seven sub-regions, created specifically for this purpose. That examination is briefly outlined in the main report and described more fully here.
- A3. Figure A1 shows how the North Wales RAWP area is divided into two sub-regions. The sub-regions were created, at Welsh Government's suggestion, for the specific purpose of facilitating strategic minerals planning and collaborative approaches between LPAs. They each represent distinctive 'market areas' between which there is relatively little movement of aggregates, except for exports to England, and within which detailed, strategic consideration can be given as to the most appropriate patterns of supply. Looking carefully at the balance of supply between the LPAs within each sub-region is an important aspect of this. It should be noted that Conwy, though previously forming part of the North-East Wales group of LPAs in the North Wales RAWP reports, is now included in the North-West Wales sub-region of the RTS. The decision to make this change was made following extensive discussion amongst the RTS Steering Group and was agreed by the RAWP.
- A4. For some LPAs, where the existing supply pattern already seems to provide a sensible balance between the spatial distributions of demand, resource availability and other factors, the new apportionments simply reflect the pattern of historical sales (i.e. the regional figures have been divided between the LPAs in proportion to their share of recent historical sales). In other areas, the new apportionments have been adjusted – primarily to take account of the distribution of planned housing activity, as indicated by the housing requirement figures in adopted LDPs - so that they reflect an improved (more equitable, more sustainable) spatial balance between supply and demand. In all cases, consideration has also been given, at least qualitatively, to factors such as environmental capacity, proximity and transport networks. The later sections of this document provide more detailed observations regarding these various factors within each of the North Wales sub-regions.
- A5. It should be noted that the historical sales figures and apportionments relate only to land-won primary aggregates. These materials are needed to satisfy the residual levels of demand, once allowance has been made for the 'top-sliced' proportion of supply which is obtained from secondary and recycled sources and from marine-dredged aggregates. These materials contributed to the overall market throughout the baseline period and will continue to do so, leaving only the residual demand to be supplied from primary land-won sources.

Figure A1: Sub-Regional Areas and their constituent Local Planning Authorities in North Wales

- A6. No reliable monitoring data on recycled and secondary aggregate production is currently available for any part of the UK. The recently updated Mineral Planning Factsheet on aggregates produced by the British Geological Survey (BGS, 2019)¹ estimates that these materials now constitute approximately 30% of overall supply (based on data provided by the Mineral Products Association), and that most of the material that is suitable for aggregates use (primarily construction, demolition and excavation waste – CD&EW) is already being recovered and utilised. This has been the case since around 2005² and the proportion is thought unlikely to change in the foreseeable future. Being closely dependent upon the rate of construction activity, the actual tonnages can therefore be expected to rise and fall in line with variations in the overall rates of economic growth and will have a neutral impact on the demand for primary aggregates, compared to that seen during the baseline period (2007 to 2016). Moreover, in the case of recycled aggregates, since the arisings of CD&EW are (by definition) very closely associated with the occurrence of new construction work, their availability is unlikely to have any significant influence on spatial patterns of demand.
- A7. That might not be the case for secondary aggregates, which have a more varied spatial distribution, with different types and different quantities being available within each LPA. Again, there are no up-to-date data sources to provide further details, but there are indications that some of these sources may be declining in availability, which would potentially increase the demand on primary aggregates within those areas. Further observations on this are noted, where appropriate, in the later sections on individual sub-regional areas.

Land-won Primary Aggregate Production

- A8. The historical sales figures for all land-won primary aggregates within each LPA in North Wales (including both crushed rock and natural sand & gravel) are shown in Table A1, below. The

¹ <https://www.bgs.ac.uk/downloads/start.cfm?id=1355>

² https://mineralproducts.org/documents/Contribution_of_Recycled_and_Secondary_Materials_to_Total_Aggs_Supply_in_GB.pdf

proportion supplied from crushed rock sources (averaged over 10 years) is shown in the right-hand column – the balance being sourced from land-won sand & gravel sites. The LPAs are grouped according to the sub-regions shown in Figure A1. The origin of the data is explained fully in Chapter 3 of the main text.

Table A1: 10-year and 3-year Total Land-Won Primary Aggregates Sales Averages (to 2016) for each LPA in North Wales.

Local Planning Authority	10-yr Average Aggregate Sales (total) (mtpa)	3-yr Average Aggregate Sales (total) (mtpa)	Highest of 3-yr and 10-yr ave. sales in each LPA (mtpa)	Proportion from crushed rock sources
Denbighshire	0.329	0.043	0.329	100%
Flintshire	2.663	3.204	3.204	93.77%
Wrexham	0.435	0.514	0.514	0%
Conwy + Snowdonia NP	0.955	0.813	0.955	100%
Gwynedd	0.868	0.898	0.898	84.56%
Isle of Anglesey	0.236	0.255	0.255	100%
TOTAL, North Wales			6.155	86.6%

SOURCE: Collated by the North Wales RAWP secretary from confidential industry data.

- A9. The figures show that the supply of land-won sand & gravel has been dominated by Wrexham and Flintshire, this being largely a reflection of their proximity and good access to the main market areas in both North East Wales and adjoining parts of North West England. It also reflects the existence of substantial glacio-fluvial sand & gravel resources in those areas - particularly to the east of Wrexham. Whilst similar deposits exist in North West Wales, particularly in Gwynedd, these are less well-placed to serve the main markets, and production there is therefore more limited.
- A10. In the case of crushed rock aggregates, historical demand has again been focused primarily on North East Wales, and for the same reasons, but in this case the materials have overwhelmingly been supplied from Flintshire. This reflects the extensive resources of high quality Carboniferous Limestone within relatively unconstrained areas to the east of the Clwyddian Hills AONB, in contrast to the situation in Wrexham, where the continuation of these resources falls almost entirely within the AONB. Significant quantities of limestone from Flintshire, including high purity limestone for industrial uses, are exported into England, and some are used for cement manufacture at Padeswood near Mold. Limestone produced for non-aggregate uses, however, is excluded from the statistics given in this report. Limestone production also takes place elsewhere in North Wales, together with igneous rock and slate production, particularly in Gwynedd. In the case of Conwy, the output figures incorporate sales from one small igneous rock quarry within the Snowdonia National Park, in order to maintain confidentiality.
- A11. Further observations on the relationships between production, resources, markets and environmental capacity within each of the sub-regions are given in paragraphs A26 *et seq.*, below.

Marine-dredged Aggregates

- A12. In North Wales, very little marine-dredged sand & gravel is used. The figures for marine aggregates are combined, in the annual RAWP reports, with those for land-won sand & gravel, but are shown, in the latest AM Survey report (for 2014) to be in the order of 30,000 tonnes per annum (tpa) (a figure which has gradually declined from 48,000 tpa in 1997). Dredging licences within the coastal waters of North Wales are primarily used to supply Merseyside, with substantial quantities being landed in Liverpool. This, in turn, offsets the pressure for exports to NW England from land-based resources in North-East Wales.
- A13. For the time being, it seems reasonable to suppose that marine-dredged aggregates will continue to supply a similar (very small) proportion of overall demand as they have done over at

least the last twenty years, so the demand for land-won aggregates in any of the LPAs in North Wales is not likely to be affected.

Secondary Aggregate Production

- A14. Secondary aggregates comprise the by-products of various industrial processes, including metallurgical slags and power station arisings, but also the by-products from certain types of non-aggregate mineral extraction, such as colliery spoil and slate waste, and from the recycling of glass, ceramics, asphalt plantings and rail ballast³.
- A15. Aggregate production from metallurgical slags and from coal-fired power station arisings, no longer occurs in North Wales. Small amounts of aggregate minerals (sandstone and occasionally sand) arise adventitiously from the reworking of former colliery spoil tips or from the working of opencast coal. In North Wales, almost all former colliery waste tips (mainly in Flintshire/Wrexham) have been either landscaped as part of reclamation schemes or utilised for base fill material. Volumes still available have not been assessed recently but are understood to be small or insignificant.
- A16. In North Wales, crushed slate, derived either from slate waste (as a by-product of roofing slate production) or quarried specifically for use as primary aggregate, features significantly in the overall pattern of supply, especially in Gwynedd. Depending upon the quality and characteristics of the material involved, it is used not only in bulk fill applications, but also as an uncoated road stone and, increasingly, as an aggregate in the production of concrete building blocks.
- A17. Both slate waste and quarried slate have been included in the overall figures for crushed rock production within the North Wales RAWP reports since 2008 and, over the 10-year baseline period (up to 2016), have accounted for an average of 9.7% of total crushed rock sales. The proportion fell abruptly after 2009, from a peak of more than 16% in 2007. Although sales volumes fell sharply, to less than half of the levels seen in 2007, the reduction in proportional share was less dramatic and this had recovered to more than 11% by 2016. However, given that slate production is already included in the crushed rock statistics, this trend has no implications for the overall level of future demand, only for the balance between slate and other types of crushed rock.
- A18. In August 2019, Gwynedd Council published a draft management plan for the slate areas of north west Wales, relating to their identification as a UK candidate for potential UNESCO World Heritage status. The proposals include bans on quarrying in some areas alongside the revocation of all extant mineral working permissions. Depending on details, if implemented, this could have a significant effect on the future demand for other sources of primary crushed rock aggregates in the region.
- A19. The various sources of secondary aggregate noted above, together with recycled aggregates, as discussed below, are currently exempt from the Aggregates Levy, in a deliberate attempt to minimise the use of primary aggregates. At the time of writing, the Aggregates Levy itself was in the process of being comprehensively reviewed by HMRC (... update to be added in due course...)

Recycled Aggregates

- A20. Aggregates produced from construction, demolition and excavation wastes (CD&EW) form an important contribution to the overall consumption of construction aggregates. The 2008 RTSs noted a total output for the whole of Wales of 3.97mt, based on 2005 survey data, and suggested a roughly 3 to 1 split between South Wales and North Wales, based on earlier surveys and population ratios. They also noted that, despite the lack of quantitative detail, it is inevitable that the greatest volumes of CD&EW arisings and usage are in the urban areas. The RTS documents emphasised, however, that all statistics for this sector need to be used with a high degree of caution, because of the low rate of response to the surveys.
- A21. The situation, in terms of available data, has not improved since the original RTSs were published. No new survey data is available, so any observations on recent or future trends can

³ it might appear more logical to group these substances with other recycled materials from construction, demolition and excavation wastes (CD&EW). However, the coverage of CD&EW is already well defined in terms of survey returns, so those items are included here as secondary aggregates.

only be regarded as broad approximations. If anything, the efficiency of recycling is likely to have increased, and the introduction of WRAP's (2005) 'Quality Protocol' for the production of aggregates from inert waste may have increased the proportion and usage of higher value products derived from the various recycled sources. Such improvements, however, represent only small increments on the progress which had previously been made - primarily as a consequence of the price advantages resulting from the landfill tax and, to a lesser extent, the aggregates levy. The view of the Mineral Products Association (MPA), which is not disputed by the NRW, remains that there is little opportunity for significant further increase in the proportion of construction aggregate likely to be derived from this sector. As noted earlier, the future availability of recycled aggregates seems likely to be inextricably linked to the overall rates of construction activity and economic growth, so the safest assumption is that it will rise and fall in a very similar way to overall demand, and will thus have a neutral impact on the demand for primary aggregates, compared to the baseline period (2007 to 2016).

Imports and Exports

- A22. Wales has always been a net exporter of land-won aggregates. Data on both exports and imports is recorded in the periodic Aggregate Minerals (AM) Surveys, and data for exports in the last four surveys is summarised in Table A2, below.

Table A2: Summary of key export statistics for North Wales from recent AM surveys

<i>Note: all figures exclude sales for non-aggregate use</i>	AM2001 (mt)	AM2005 (mt)	AM2009 (mt)	AM2014 (mt)
(data from Table 4k of the AM reports)				
Land won Sand & Gravel Sales	1.342	1.192	0.589	0.897
S&G Exports*	0.544	0.508	0.128	0.158
Exports as % of S&G total	41%	43%	22%	18%
Limestone Sales	6.062	4.641	2.636	3.508
Limestone Exports*	3.344	2.973	1.116	2.226
Exports as % of Limestone total	55%	64%	42%	64%
Igneous Sales	1.136	1.022	0.610	0.660
Igneous Exports*	0.091	0.277	0.064	0.054
Exports as % of Igneous total	8%	27%	10%	8%
Sandstone Sales	0	0	0	0
Sandstone Exports*	0	0	0	0
Exports as % of Sandstone total	0%	0%	0%	0%
Total Crushed Rock Sales**	7.198	5.663	3.245	4.168
Total CR Exports*	3.436	3.251	1.178	2.280
North Wales CR Exports as % of CR total	48%	57%	36%	55%

* 'exports' are primarily to England but include some movement between South Wales and North Wales.

** Unlike the figures used elsewhere in this Review, crushed rock sales in the AM reports exclude slate

- A23. In North Wales, the main aggregate exports, by far, are those of Carboniferous Limestone which are supplied mainly to North West England. These exports, in turn, are sourced primarily from the NE Wales sub-region (mostly from Flintshire) with smaller quantities from NW Wales (especially Conwy). The AM Survey figures generally show that, as limestone (and overall) sales fell during the recent recession, the proportion (as well as the totals) of exports also fell, but that both have since recovered substantially. This implies that, during periods of recession, for general-purpose limestone aggregates, there is a reduced dependence by importing regions on supplies from more distant sources, as would be expected. But the reverse is also true: as the economy rebounds from the recession, the demand for exports from North Wales has begun to increase once again, and more quickly than the overall rate of economic growth. However, whether or not this will eventually reach or exceed the levels of demand experienced prior to the recession is uncertain: it will depend, to a large extent, on the future level of economic growth and construction activity within North West England.

- A24. Imports of land-based aggregates are very minor, by comparison with exports. In North Wales in 2014 (from Table 5k of the AM 2014 survey report), land-based imports amounted to 0.023mt of sand & gravel (mostly from NW England) and 0.128mt of crushed rock, primarily igneous rock from South Wales. These compare with imports of 0.03mt of land-won sand & gravel and 0.653mt of crushed rock in the previous (AM 2009) survey. The reduction in crushed rock imports from South Wales has been quite significant.
- A25. Imports and exports of marine-dredged sand and gravel between England and Wales are only relevant to the RTS apportionment exercise if they affect the continuity of supply of these materials to Wales and thus give rise to increased demand on land-based resources. This is potentially an issue in South East Wales (see Appendix B) but not in North Wales, where the quantities involved are relatively minor. In Liverpool Bay, the only licence area in Welsh waters remains a net exporter to north west English markets.

Sub-Regional Analysis

- A26. In the First Review, the analysis of patterns supply and demand for North Wales was carried out for the region as a whole. In this review, as explained earlier and as illustrated in Figure A1, above, it is based on two separate sub-regions, each one being intended to approximate a relatively 'self-contained' market area for aggregate production and sales, with little movement of aggregate taking place between adjoining areas, other than exports to England.
- A27. Maps corresponding to each of these areas are presented in Figures A2 to A5, below. For each sub-region there are three maps. The first one shows the distribution of aggregate resources and existing quarries. The second map, at a smaller scale, deals with 'proximity' issues (i.e. the relationships between resources, quarry locations, major roads and the distribution of both planned housing requirements in each LPA and existing urban areas). Planned housing requirements are used in preference to the population density maps that were used in the First Review, although both distributions are shown, for comparison, in Figures 4.7 and 4.8 of the main document. The third map for each sub-region then deals with environmental capacity issues, utilising output from the earlier IMAECA analysis (Enviros, 2005). The maps are presented at slightly different scales (as indicated in each case by the 30km scale bar).
- A28. It must be emphasised that these maps show only resources and not permitted reserves. **Resources** are geological materials, including rocks and naturally occurring sand & gravel, which have the potential to be used for a particular purpose (in this case as construction aggregates). **Permitted Reserves** are those parts of a resource which are known to be suitable for this purpose (usually as a result of detailed ground investigations and laboratory testing) and which have valid planning permission for the winning and working of the materials in question. The outlines of permitted reserves are not shown on the maps.
- A29. The resources are illustrated in several main categories. Natural **sand & gravel resources**, as mapped by the British Geological Survey (BGS) may be associated with five different types of 'superficial' deposits, as shown on the key to each map, though the extent of workable mineral within these deposits is highly variable. The maps for NW Wales show an additional category of sand & gravel resource blocks (shown by the deep red shading) that were identified in more detailed study for the Welsh Assembly by the University of Liverpool and Enviros (2003).
- A30. **Crushed rock resources** within the area comprise Carboniferous Limestones (which are subdivided, on the larger maps, into high purity (>97% CaCO₃) and other limestones); Igneous Rocks (including HSA dolerites, which are differentiated on the larger maps); and Slates. Numerous small outcrops of HSA Sandstone are also shown, though none of these have been worked in recent decades.
- A31. The quarries shown on the maps are categorised in the same way as the resources. They include both active and inactive units (as of 2018), the latter including a small number of dormant sites. Separate listings of all active, inactive and dormant sites in North Wales are given in Tables A3, A4 and A5, respectively.

North East Wales Sub-Region

- A32. Figure A2, below illustrates the distribution of quarries and land-based aggregate resources within North-East Wales, incorporating Denbighshire, Flintshire and Wrexham. The crushed rock resources here comprise:
- **Carboniferous Limestone**, currently worked at Aberdo, Halkyn, Pant, Hendre and Cefn Mawr quarries in Flintshire, and at Denbigh Quarry in Denbighshire;
 - **Silurian slates**, currently worked, on a small scale, at the Berwyn Slate Quarry and from slate waste tips at Moel-y-Faen Quarry – both in Denbighshire; and
 - **Ordovician igneous rocks**, predominantly volcanic tuffs in southern Denbighshire and adjoining parts of Wrexham. None of these is currently worked;
- A33. In addition, there are extensive **glaciofluvial sand & gravel** deposits, primarily in Wrexham (where they are worked at Borrás and, intermittently, at Ballswood) but also in Flintshire (where they are currently worked, on a smaller scale, at the Maes Mynan and Fron Haul gravel pits) and in parts of Denbighshire. There are also quite extensive mapped deposits of **Sub-Alluvial** and **River Terrace sand & gravel**, though these are not commercially exploited.
- A34. Figure A3 illustrates the relationships of these quarries and resources to issues relating to the likely pattern of demand (as indicated by proximity to existing urban areas, planned housing requirements and the primary road network); and issues relating to environmental capacity.
- A35. Carboniferous Limestone is by far the main source of crushed rock production within the sub-region. The resources are widespread but are primarily worked in Flintshire since, in this area, they are very well placed in terms of proximity to the main centres of demand, including exports to Chester, Merseyside and other parts of north west England. In this respect, proximity to the A55 North Wales coast road is a major factor. Unworked resources close to these quarries are characterised by generally low environmental capacity, whereas some of the resources further north, in Flintshire, and in parts of Denbighshire, are better-placed in that respect. Whilst those areas are less ideal in terms of proximity to major markets and transport routes, they could have an important role to play in supplementing future supplies from the main quarrying areas, as well as supplying urban areas and infrastructure projects along the North Wales coast. The southern part of the Carboniferous Limestone outcrop in Flintshire, and almost all of the outcrop within Wrexham, are heavily constrained by their location within the Bryniau Clwyd AONB.
- A36. The only two operational slate workings in the sub-region are also located within the southern part of that area but are understood to produce little or no aggregate material other than decorative chippings.
- A37. Overall, there is limited justification for changing the existing pattern of supply of crushed rock within the sub-region, other than to encourage an increase in the proportion supplied from Denbighshire. This is in recognition of the surplus of existing permitted reserves within that county, which can be used to offset some of the very large projected shortfall of reserves in neighbouring Flintshire. This has been accomplished through an adjustment of the apportionments given to each LPA as explained in Table 5.2 of the main report. Even with that adjustment, Flintshire is facing the need to make new allocations for Carboniferous Limestone production, totalling at least 35.928 million tonnes (Table 5.6 of the main document).
- A38. In the previous (First) review of the RTS, the crushed rock apportionment for Flintshire had been increased, with a corresponding reduction in those for Gwynedd and Anglesey, in order to encourage an eastward shift in future crushed rock production. This was intended to better reflect the anticipated distribution of demand. In practice, although the level of production in Anglesey in subsequent years has been close to (less than) the previous apportionment, sales in Gwynedd have been much higher, suggesting that there is a corresponding demand in north-west Wales for which supplies need to be maintained. The notion of shifting production from Gwynedd to Flintshire has therefore been discontinued.

Figure A2: Aggregate Resources and Quarries in the North East Wales Sub-Region

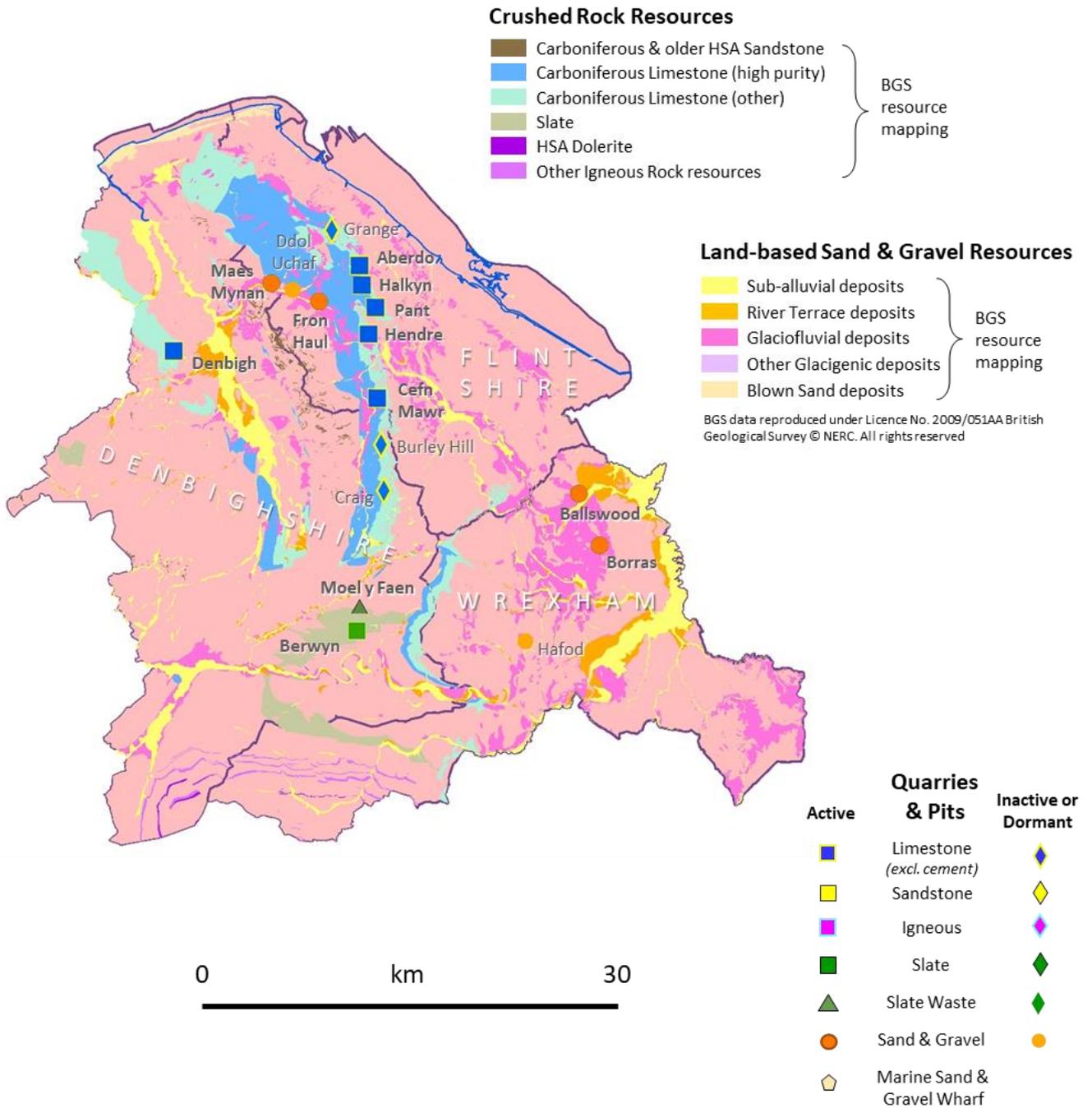
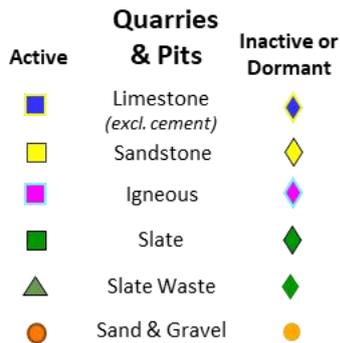
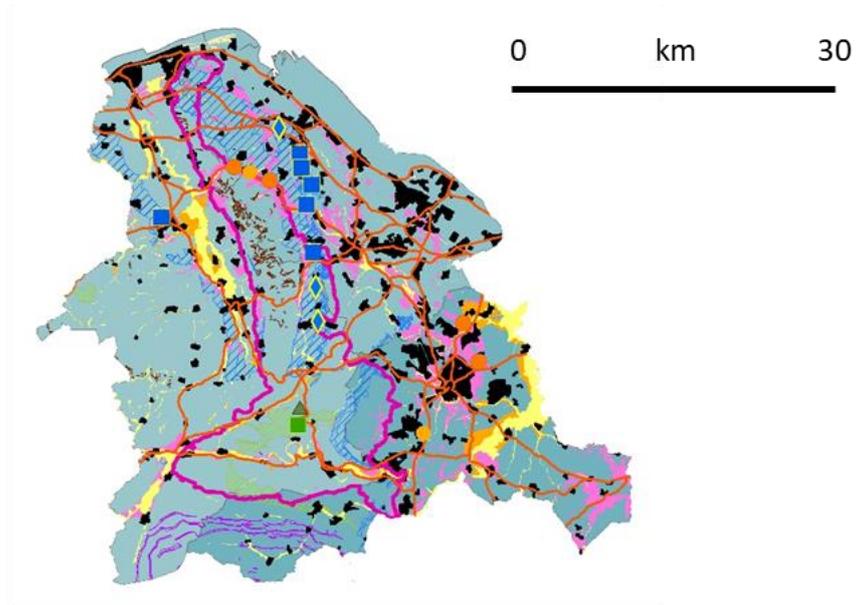
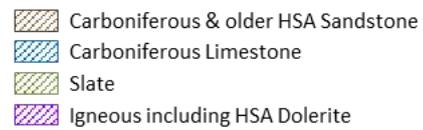


Figure A3: Aggregate Resources, Quarries, Planned Housing Requirements and Environmental Capacity in the North East Wales Sub-Region

Annualised Housing Requirements in Adopted LDPs (houses per year)



Crushed Rock Resources



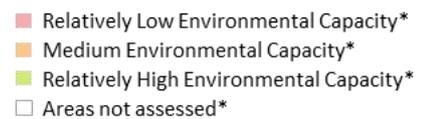
Land-based Sand & Gravel



BGS data reproduced under Licence No. 2009/051AA British Geological Survey © NERC. All rights reserved



Environmental Capacity*



* Assessed as part of the 'IMAECA' project, (Implementing the Methodology for Assessing the Environmental Capacity for Primary Aggregates - Enviro, 2005).

A39. In the case of land-based sand and gravel extraction in North-East Wales, the current supply pattern is dominated by one site within Wrexham, although smaller contributions are also made by three other active (or intermittently active) pits: one other in Wrexham, and two in Flintshire. Whilst the Wrexham sites are ideally placed in relation to the markets of Flintshire, Wrexham and adjoining parts of NW England, they are much further away from the smaller but important local markets along the North Wales coast (both in Denbighshire and neighbouring Conwy). From a proximity point of view there is therefore a need to maintain adequate supplies to those areas from the sites and resources in both Flintshire and Denbighshire. Although some mapped resources do exist in Conwy, the nearest other working gravel pits are much further west in Gwynedd. As shown in Table 5.4 of the main document, there is a significant shortfall of existing permitted reserves of sand & gravel within Flintshire, and a landbank (at the end of 2016) of only 6.1 years. This is below the minimum requirement of 7 years stipulated in MTAN 1 and points to an urgent need for the release of further permitted reserves. There is also a shortfall in Wrexham, though in that case the landbank (in 2016) stood at 19.6 years. Nevertheless, there is a need for further allocation within that area, in order to meet RTS requirements.

North West Wales Sub Region

A40. Figure A4 illustrates the distribution of quarries and land-based aggregate resources within the North West Wales sub-region, incorporating Gwynedd, the Isle of Anglesey, Conwy and the Snowdonia National Park. In these areas, the crushed rock resources comprise:

- **Carboniferous Limestone**, currently worked at two quarries northern Conwy (Raynes and Abergele), and three units on Anglesey (Aber, Nant Newydd and Rhuddlan Bach);
- A wide range of **igneous rock resources**, including the Precambrian Coedana Granite of Anglesey (worked at Gwalchmai, Gwyndy and Gaerwen quarries); Granite of unknown age (currently worked at Trefor Quarry on the north coast of the Llŷn Peninsula); Ordovician diorite (worked at Penmaenmawr quarry the Conwy coast); Ordovician HSA dolerite (worked at Minffordd in Gwynedd); and other Ordovician igneous rocks at Nanhoron Quarry on the Llŷn Peninsula; and
- **Cambrian and Ordovician slates**, currently worked either as virgin aggregate or from previously discarded slate waste at numerous sites within Gwynedd and at two sites within the Snowdonia National Park.

A41. In addition, there are **glaciofluvial sand & gravel** deposits primarily in northern Gwynedd and, especially, across the Llŷn Peninsula. In addition to the deposits mapped by the BGS, these include a number of potential resource blocks identified in more detail by the University of Liverpool and Enviro (2003) in a study for the Welsh Assembly. At present, sand & gravel is worked only at two sites in Gwynedd (Penygroes and Cefn Grainog Farm), whilst sand (only) is worked at Chwarel Bryncir. Additional, but relatively minor sand & gravel deposits are mapped by the BGS as glacial, sub-alluvial, river terrace and blown sand deposits, though none of these is currently worked.

A42. Figure A5 illustrates the relationships of the various resources and quarries to issues relating to the likely pattern of demand (as indicated by proximity to existing urban areas, planned housing requirements and the primary road network); and issues relating to environmental capacity. Each of these factors is discussed below in relation to each type of resource.

Figure A4: Aggregate Resources and Quarries in the North West Wales Sub-Region

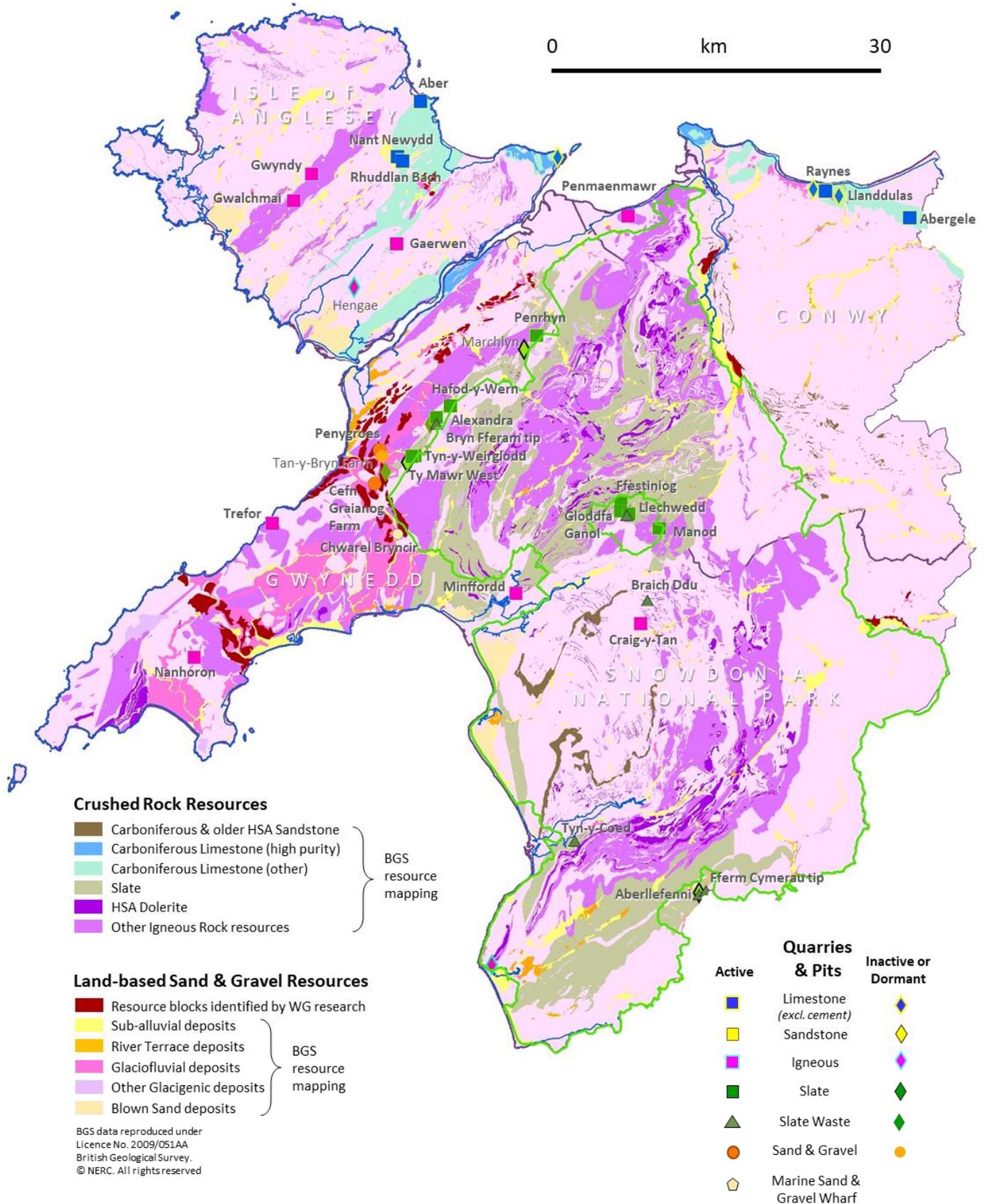
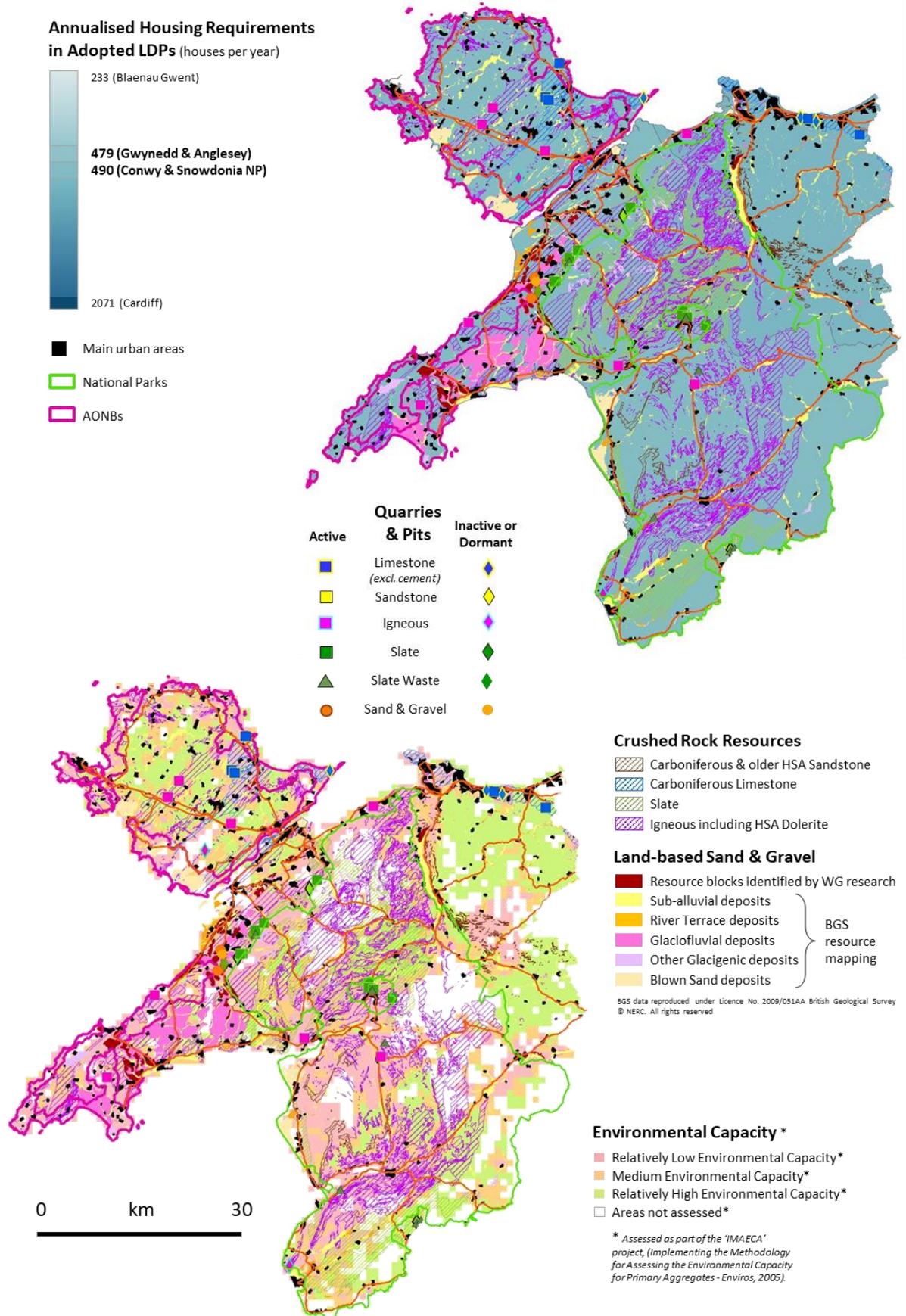


Figure A5: Aggregate Resources, Quarries, Planned Housing Requirements and Environmental Capacity in the North West Wales Sub-Region



- A43. Carboniferous Limestone resources within North West Wales are restricted to the northern part of Conwy, Anglesey and one (currently unworked) area on the Gwynedd side of the Menai Straits, to the south-west of Bangor. Whilst some of these outcrops coincide with areas of relatively low environmental capacity, or are constrained by Areas of Outstanding Natural Beauty, others (including those surrounding Abergele Quarry and smaller areas within Anglesey) are characterised by relatively high environmental capacity and may therefore offer scope for future resource development. The two quarries in Conwy are both operated by major aggregate producers and serve wide market areas along the north Wales coast. In terms of proximity to both urban areas and transport links, they are both well-placed, though they are close to the limits of viability for exports by road into England. Raynes Quarry also exports significant quantities of limestone to North West England, and elsewhere, via a dedicated jetty. The three limestone quarries in Anglesey, by comparison, are all operated by small local firms and are presumed to serve only local markets.
- A44. The 'igneous rock' resources, as shown on the BGS maps, which encompass both igneous and metamorphic rock types, all have similar suitability for use as general purpose hard rock aggregates. This includes being used as a substitute for limestone in most construction applications. However, in almost all parts of the sub-region, the igneous rock resources are either subject to National landscape constraints (National Park or AONBs) or fall within areas of relatively low environmental capacity. The main exceptions are much of the Coedana Granite outcrop in central Anglesey and some of the igneous outcrops in the eastern side of the Llŷn Peninsula. In some areas, (shown on the maps as 'HSA Dolerite'), the rocks are potentially suitable for use as High Specification Aggregate for road surfacing materials (as defined in Chapter 4 of the main document) and are worked as such at Minffordd near Porthmadog in Gwynedd. This is currently the only unit in this group which exports aggregate to England. Penmaenmawr diorite quarry on the north coast of Conwy was formerly an exporter of rail ballast to England, by rail, but ballast production here has been greatly reduced since 2008, when the contract to supply Network Rail was lost. Both of these units fall outside the National Park but are within areas of low environmental capacity. All other igneous quarries in the sub-region tend to supply only local markets although, in the recent past, these have included major contracts such as upgrading the A55 North Wales Coast road and the A5 across Anglesey.
- A45. Slate resources, including both virgin material quarried specifically for the purpose, and material derived from the processing of previously discarded slate waste, are an important source of construction aggregate within North West Wales. Although materials from slate waste are technically classed as secondary aggregate, and although all types of slate are currently exempt from the Aggregates Levy, slate that is used as a construction aggregate has traditionally been counted as primary aggregate within the North Wales RAWP reports. Virtually all of the slate resources within the sub-region are located within the Snowdonia National Park, though only two operational sites, working former waste tips, lie within the Park. The majority of ongoing slate aggregate production is from sites located immediately outside the National Park boundaries although most (but not all) of these are within areas mapped as being of relatively low environmental capacity.
- A46. Given that most slate aggregate is used locally within NW Wales, and that most of the resources are constrained by the National Park, there is little to suggest that the existing supply pattern either needs to change or is capable of doing so. There is scope for the output from established sites in Gwynedd to increase, in response to any future rise in demand in the NW Wales sub-region, but there is limited (if any) likelihood of this material displacing sales of limestone aggregate to the main markets in North East Wales and North West England. This could potentially happen to some extent, if there were to be a significant increase in the Aggregates Levy, giving slate aggregates a further price advantage, but the reverse could be true if the Aggregates Levy were to be abolished, in line with the recent legal challenge by the British Aggregates Association. Moreover, any potential sustainability benefits associated with increased use of slate waste would need to be balanced against the increased radius of transportation from sites within Gwynedd, which would be contrary to the proximity principle. Slate would not be able to substitute, however, for all other types of crushed rock aggregate, particularly road surfacing materials, and applications where high crushing strength is required.
- A47. Overall, there appear to be few opportunities and little, if any, justification for the spatial pattern of crushed rock production in North West Wales to be altered. Both the markets and the

available resources are widely dispersed and, at the present time, there are adequate permitted reserves to provide for the RTS requirements over the next 25 years.

- A48. In the case of land-based sand and gravel extraction, the current supply pattern is limited to just three sites in Gwynedd (two sand & gravel operations and one supplying just sand). As shown in Table 5.4 of the main document, Gwynedd (and therefore North West Wales as a whole) is now facing a shortfall of permitted reserves, compared with the RTS 2nd Review requirements, with an existing (2016) landbank of only 6.7 years. This is below the minimum level required by MTAN 1 and points to an urgent requirement for further planning permissions to be granted. As noted earlier, there are extensive areas of potential sand & gravel resources within Gwynedd, both to the east and south of Caernarfon, and to the west of Pwllheli, within resource blocks identified by the Liverpool University (2003) study. An important requirement, however, is to ensure that the resources provide an appropriate balance between fine aggregate (sand) and coarse aggregate (gravel).

Summary of Current Sources of Supply in North Wales

- A49. Tables A3 to A5, below, list the currently active, inactive and dormant aggregate quarries (respectively) in each of the sub-regions of North Wales, updated to August 2018. The lists exclude quarries devoted to the manufacture of cement, building stone, silica sand, shale or other non-aggregate products.

Table A3: Active Aggregate Quarries in North Wales (2018)

Quarry Name	Operator	Commodity	Easting	Northing
DENBIGHSHIRE				
Berwyn	Berwyn Slate Quarry Ltd	Slate	318500	346300
Denbigh	Breedon Southern	Limestone	305090	367050
Moel y Faen	Jones Bros Ruthin	Slate	318700	348100
FLINTSHIRE				
Aberdo	CCP Building Products Ltd	Limestone	318700	373300
Fron Haul	Breedon Southern	Sand & Gravel	315700	370600
Halkyn	CEMEX UK	Limestone	319000	372000
Hendre	Tarmac	Limestone	319400	368000
Maes Mynan	Breedon Southern	Sand & Gravel	311500	372100
Pant	Tarmac	Limestone	319800	370200
WREXHAM				
Ballswood	DP Williams Ltd	Sand & Gravel	335200	356600
Borras	Breedon Group	Sand & Gravel	336300	352500
CONWY				
Abergele	Hanson Aggregates	Limestone	296700	375800
Penmaenmawr	Hanson Aggregates	Igneous	270135	375515
Raynes	CEMEX UK	Limestone	289000	378190
SNOWDONIA				
Braich Ddu	John Roberts	Slate Waste	271985	338460
Craig y Tan	G E Williams	Igneous	271349	336224
Ty'n-y-Coed	R. Meredith, Arthog Slate Co	Slate Waste	265030	315275
GWYNEDD				
Aberllefenni Slate Tip	R. Meredith, Arthog Slate Co	Slate Waste	276920	310290
Alexandra	Caernarfon Crown Slate	Slate + Slate Waste	251800	356105
Bryn-Fferam	Wynne's Transport Ltd	Slate Waste	251810	355495
Cefn Graianog	Tudor Griffiths Group	Sand & Gravel	246000	349500
Chwarel Bryncir	JC Evans Ltd	Sand	248100	344855
Fferm Cymerau tip	?	Slate Waste	277572	310485
Ffestiniog	Welsh Slate (Breedon Group)	Slate + Slate Waste	269206	347186
Gloddfa Ganol quarry + tip	Welsh Slate (Breedon Group)	Slate Waste	269325	347590

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Hafod-Y-Wern	Gwilym Elias Owen	Slate Waste	253135	357215
Llechwedd Slate Mine	Northern Welsh Quarries Ltd	Slate	270200	346800
Llechwedd tip	Northern Welsh Quarries Ltd	Slate Waste	270000	346680
Manod	Welsh Slate (Breedon Group)	Slate	273100	345400
Minffordd (HSA)	Breedon Group	Igneous	259400	339100
Nanhoron	E Thomas, Nanhoron Quarry	Igneous	228650	332980
Penrhyn Slate Quarry + tip	Welsh Slate (Breedon Group)	Slate + Slate Waste	261375	364000
Penygroes	Tudor Griffiths	Sand & Gravel	246370	352985
Trefor	R T Davies	Igneous	236100	345900
Ty Mawr West Quarry + tip	Ellis Jones	Slate + Slate Waste	249650	352450
Tyn-y-Weirglodd	Welsh Slate (Breedon Group)	Slate Waste	249450	352195
ISLE OF ANGLESEY				
Aber	Anglesey Masonry Ltd	Limestone	250300	386650
Gaerwen	Anglesey Aggregates Ltd	Igneous	248000	372830
Gwalchmai	Hogan Aggregates	Igneous	238175	376990
Gwynydy	Hogan Aggregates	Igneous	239955	379665
Nant Newydd	Clive Hurt Plant Hire (Anglesey)	Limestone	248100	381100
Rhuddlan Bach	Clive Hurt Plant Hire (Anglesey)	Limestone	248600	380700

Table A4: Inactive Aggregate Quarries in North Wales (2018)

Quarry Name	Operator	Commodity	Easting	Northing
DENBIGHSHIRE				
Burley Hill	Tarmac	Limestone	320280	360075
Graig	Tarmac	Limestone	320500	356500
FLINTSHIRE				
Ddol Uchaf	Breedon Southern	Sand & Gravel	313800	371500
Pen-yr-Henblas	Grosvenor Estate	Limestone	319100	372900
WREXHAM				
Hafod	Cory Environmental Ltd	Sand & Gravel	330800	345600
CONWY				
Llanddulas	Waste Recycling Group	Limestone	290300	377460
Plas Gwilym	Plas Gwilym Environmental	Limestone	287850	378100
GWYNEDD				
Aberllefenni Mine	Wincillate Ltd	Slate	276920	310290
Crown New	Caernarfon Crown Slate	Slate Waste	251205	355465
Greenarfon	Mulcair Ltd	Slate Waste	246950	350840
Twll Llwyd	W Humphries	Slate	249000	351800
ISLE OF ANGLESEY				
Dinmoor	Buckley Estate, Beaumaris	Limestone	263405	381173
Hengae	Hogan Aggregates	Igneous	244000	368600
Penmon	Jones Bros Ruthin	Limestone	263555	381290

Table A5: Dormant Aggregate Quarries in North Wales (2018)

Quarry Name	Operator	Commodity	Easting	Northing
FLINTSHIRE				
Grange	Mr. D. Priestley ? or Tarmac ?	Limestone	316660	375935
SNOWDONIA NATIONAL PARK				
Tonfannau	Spencer Industrial (N. Wales)	Igneous	257105	303345
GWYNEDD				
Marchlyn	First Hydro	Slate	260200	362675
Tan y Bryn Farm	G & G L Bowness	Sand & Gravel	246640	352350
Twll Coed	Welsh Slate (Breedon Group)	Slate	249165	351945

- A50. Whilst any of the sites listed in these tables may be able to contribute to future supply (subject to the dormant sites obtaining new development consents through the ROMP process⁴), it is only the active and remaining inactive sites which contributed to the reserves figures presented in Table 5.4 and 5.6 of the main document. Reserves at dormant sites are noted separately in those tables. The active sites and some of the currently inactive ones, together with a small number of other sites which have since closed, contributed to the historical sales over the baseline period (2007 to 2016).
- A51. Full lists of active, inactive and dormant sites for individual years prior to 2018 are given in the relevant annual RAWP reports.

Apportionments, Allocations and Guidance to LPAs in North Wales

- A52. Tables A6 and A7, below, summarise the apportionments, permitted reserves and allocations for land-won sand & gravel and for crushed rock (respectively) which have been assigned to each Local Planning Authority in North Wales.
- A53. The pages which follow set out in more detail the recommendations and guidance for each individual LPA in the Region, drawing upon the figures set out in these tables. The LPAs are dealt with in alphabetical order. In each case, reference to the 'Plan period' relates to the end date of the Local Development Plan which has been adopted or is in preparation (whichever is later) for that particular planning authority.
- A54. As explained more fully in the main document, the figures for each authority are based on the assumptions that future aggregate requirements will increase in future years to reflect the increased planned requirements for house construction, and that supplies of alternative aggregates, from marine, secondary and recycled sources, will continue to be maintained in proportions comparable to those experienced during the baseline period (2007 to 2016).
- A55. The accuracy of these assumptions will continue to need to be monitored by the planning authorities, using information from various data sources and new surveys (e.g. by Welsh Government, NRW, and the Mineral Products Association) and that data will be used to inform a revision of the apportionment requirements, if this is needed, as part of the next review of the RTS.
- A56. It should be emphasised that the annualised apportionment figures are given only as a guide to the calculation of the total apportionment required over the duration of the LDP. In practice, sales will vary from year to year and there is no requirement for an LPA to maintain or limit those sales in line with the annualised apportionments.

⁴ ROMP is the acronym for the Review of Old Mineral Permissions, under the Environment Act 1995. Further details are given in the Glossary at the end of the main report.

Table A6: Apportionments, Reserves and Allocations for Sand & Gravel in North Wales

Local Planning Authority	New Annualised Apportionment for sand & gravel (mt)	Total Apportionment Required over 22 years	Existing permitted reserves at end of 2016 in mt	Minimum Allocation needed to meet Required Provision (mt)	Additional reserves at Dormant sites, 2016 (mt)
Denbighshire	0.000	0.000	0.000	0.000	0
Flintshire	0.223	4.912	1.369	3.543	0.5
Wrexham	0.646	14.217	12.652	1.565	0
Conwy + Snowdonia NP	0.000	0.000	0.000	0.000	0
Gwynedd	0.174	3.834	1.175	2.659	0
Isle of Anglesey	0.000	0.000	0.000	0.000	0
Sub-totals, North Wales	1.044	22.963	15.196	7.767	0.5
TOTALS Wales	1.352	29.750	18.406	11.618	0.85

SOURCE: Table 5.4 of the main document

Where allocation requirements are shown these are the minimum amounts required to meet the RTS requirements. In many cases an application for an individual new permission will exceed these amounts, in the interests of economic viability. Such applications should not be rejected purely on the grounds of exceeding the minimum requirements shown here. In some cases, the suggested allocations may already have been partially or entirely fulfilled, either by new permissions granted since 2016, or by allocations that have already been identified in LDPs. See following text for details

Table A7: Apportionments, Reserves and Allocations for Crushed Rock in North Wales

Local Planning Authority	New Annualised Apportionment for crushed rock (mt)	Total Apportionment Required over 25 years (30 years in Cardiff)	Existing permitted reserves at end of 2016 in mt	Minimum Allocation needed to meet Required Provision (mt)	Additional reserves at Dormant sites, 2016 (mt)
Denbighshire	0.860	21.500	21.710	0.000	0
Flintshire	3.359	83.968	48.040	35.928	1.41
Wrexham	0.000	0.000	0.000	0.000	0
Conwy + Snowdonia NP	1.201	30.016	62.500	0.000	0.25
Gwynedd	0.955	23.867	28.540	0.000	0
Isle of Anglesey	0.321	8.015	14.400	0.000	0
Sub-totals, North Wales	6.695	167.366	175.19	35.928	1.66
TOTALS Wales	18.872	479.816	670.850	94.101	34.20

SOURCE: Table 5.6 of the main document

Where allocation requirements are shown these are the minimum amounts required to meet the RTS requirements. In many cases an application for an individual new permission will exceed these amounts, in the interests of economic viability. Such applications should not be rejected purely on the grounds of exceeding the minimum requirements shown here. In some cases, the suggested allocations may already have been partially or entirely fulfilled, either by new permissions granted since 2016, or by allocations that have already been identified in LDPs. See following text for details.

- A57. The need for provision to extend beyond the Plan period is based on the requirement in MTAN1 for maintaining landbanks of 7 years for sand & gravel and 10 years for crushed rock, throughout the full duration of the LDP. Subject to this requirement being met, the overall provision at any given time may comprise both landbanks of permitted reserves and allocations for future working, where these are required.
- A58. In all cases, the recommendations are based on currently available information regarding reserves, production, proximity and environmental capacity. As noted in 'Box 1' of the original RTS documents, the suggested apportionments and allocations may not take fully into account all factors that may be material to the ensuring an adequate supply of aggregates obtained from appropriately located sources. Such factors may include such things as:
- The technical capability of one type of aggregate to interchange for another;
 - The relative environmental cost of substitution of one type of aggregate by another;
 - The relative environmental effects of changing patterns of supply; and
 - Whether adequate production capacity can be maintained to meet the required level of supply.
- A59. For such reasons, and as already noted in Chapter 1 of the main document, where it is justified by new (e.g. more up to date, more detailed or more precise) evidence, it is open for individual LPAs to depart from the apportionment and allocation figures recommended by the RTS when preparing their LDP policies. In doing so, however, an LPA would need to demonstrate that their intended departure would not undermine the overall strategy provided by the RTS itself (e.g. by working together with other LPAs within the same sub-region to ensure that sub-regional and regional totals are still achieved). To reinforce that concept, this Review of the RTS introduces a new requirement for all LPAs within each sub-region to agree a Sub-Regional Statement of Collaboration, and for this to be approved by the RAWP, prior to the Examination of any individual LDP within that area.
- A60. As noted in MTAN 1, paragraph A3: If the local authorities reach no agreement or if individual local authorities do not accept the Regional Technical Statement, the Welsh Assembly Government will consider its default powers to intervene in the planning process as a last resort.

ANGLESEY

Apportionment for the future provision of land-won primary aggregates

The planning authority is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: Nil
- Crushed rock aggregates provision: **0.321 million tonnes per year** until the end of the Plan period and for 10 years thereafter.

Comparison with existing landbanks

The total apportionments for Anglesey, as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are zero for land-won sand & gravel and 8.015 million tonnes for crushed rock. These figures compare with existing landbanks of zero for sand & gravel and 14.4 million tonnes for crushed rock (as at 31st December 2016).

Allocations required to be identified in the Local Development Plan

In view of the lack of any sand & gravel apportionment being required for Anglesey (which itself is a reflection of the very limited availability of potential resources on the island, by comparison with those available in neighbouring Gwynedd), there is no specific requirement for land-based sand & gravel allocations to be identified within the LDP. This represents no change from the First Review of the RTS but contrasts with the recommendations given in the original RTS which, purely on the basis of average regional proportions of total consumption, required Anglesey to make an allocation of 1.5 million tonnes of sand & gravel within its LDP.

Given that existing permitted reserves of crushed rock on Anglesey are now significantly greater than the RTS requirement, with a landbank of almost 45 years, there is no necessity for any further crushed rock allocations to be made within the LDP. However, consideration should be given to whether any of the factors set out in paragraph A58 above give rise to any other requirements for new resource allocations. If any adjustments are made, they would need to be confirmed within a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within North West Wales are submitted for Examination.

As far as possible, any allocations that are needed should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

In accordance with MTAN 1 (para. 49), no allocations should be identified within the Ynys Môn Area of Outstanding Natural Beauty, unless there are no environmentally acceptable alternatives.

Use of alternative aggregates

Little or no marine-dredged aggregates are thought to be utilised within Anglesey. As noted in the original RTS, the use of secondary aggregates is confined to occasionally processing locomotive ash at Trywyn Trewan and recycled glass is mixed with stone for asphalt at one quarry. There may be some additional potential for recycling construction, demolition and excavation wastes as aggregates in the event that MOD or industrial land is released for redevelopment but, otherwise, this source of alternative aggregate is also likely to be very limited.

Nevertheless, the residual requirements for primary land-won aggregates assume that these alternative materials will continue to be utilised to a level comparable to that seen in previous years, and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new railheads should be identified for safeguarding within the LDP, in order to provide a full range of sustainable transport options (whether or not they are currently utilised).

CONWY AND THE SNOWDONIA NATIONAL PARK**Apportionment for the future provision of land-won primary aggregates**

The planning authority is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: Nil
- Crushed rock aggregates provision: **1.201 million tonnes per year** until the end of the Plan period and for 10 years thereafter.

The majority if not all of this provision is expected to be supplied from Conwy.

Comparison with existing landbanks

The total apportionments for Conwy and the Snowdonia National Park (combined), as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are zero for land-won sand & gravel and 30.016 million tonnes for crushed rock. These figures compare with existing (combined) landbanks of zero for sand & gravel and 62.5 million tonnes for crushed rock (as at 31st December 2016).

Allocations required to be identified in the Local Development Plan

In view of the surplus of existing permitted crushed rock reserves, no further allocations for crushed rock are required to be identified within either of the LDPs. However, consideration should be given to whether any of the factors set out in paragraph A58 above give rise to any further requirements for resource allocations within Conwy. If any adjustments are made, they would need to be confirmed within a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within North West Wales are submitted for Examination.

As far as possible, any allocations should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

Paragraph 49 of MTAN 1 notes that landbanks are not required to be maintained within National Parks or Areas of Outstanding Natural Beauty. For this reason, no allocations should be identified within the National Park, unless there are no environmentally acceptable alternatives, and efforts should continue to be made to gradually transfer the very small amount of production which currently takes place within the National Park to Conwy and/or to other neighbouring authorities.

Treatment of Dormant sites

A single dormant quarry permission (Tonfannau) still exists within the Snowdonia National Park. The planning authority should assess the likelihood of this site being worked within the Plan period, subject to the completion of an initial review of planning conditions and submission of an Environmental Impact Assessment. Where there is a likelihood of reactivation, and where the site is considered by the authority to conform to the definition of 'Specific Sites', as set out in paragraph 14 of Minerals Planning Policy Wales, the extant permitted reserves may be offset against any requirements that may otherwise be identified for allocations for future working.

Use of alternative aggregates

Small quantities of marine sand are landed at Port Penrhyn in neighbouring Gwynedd, some of which may be utilised within the coastal towns in north east Conwy.

As noted in the original RTS, no significant sources of secondary or recycled aggregates have been identified in Conwy, with the possible exception of relatively small slate waste tips. Two small-scale slate waste tips are also active within the Snowdonia National Park

There is also likely to be continued recycled aggregate production, albeit at a modest level, from construction, demolition and excavation wastes, primarily within the towns along the Conwy coast.

Nevertheless, the residual requirements for primary land-won aggregates assume that these alternative materials will continue to be utilised to a level comparable to that seen in previous years, and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new wharves, jetties and railheads within Conwy should be identified for safeguarding, in order to provide a full range of sustainable transport options (whether or not they are currently utilised). This should include facilities for the transfer of slate waste from neighbouring areas, through Conwy.

DENBIGHSHIRE

Apportionment for the future provision of land-won primary aggregates

The planning authority is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: Nil
- Crushed rock aggregates provision: **0.860 million tonnes per year** until the end of the Plan period and for 10 years thereafter.

Comparison with existing landbanks

The total apportionments for Denbighshire, as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are zero for land-won sand & gravel and 21.5 million tonnes for crushed rock. These figures compare with existing landbanks of zero for sand & gravel and 21.71 million tonnes for crushed rock (as at 31st December 2016).

Allocations required to be identified in the Local Development Plan

Although Denbighshire has a zero apportionment for natural sand & gravel, and no existing permitted reserves, it does have potential resources – particularly within the Clwyd Valley, between Denbigh and Ruthin. Some of these fall within the Bryniau Clwyd AONB, but others do not. It may be possible for these areas to be worked, in future, as alternatives to the deposits in adjoining parts of Flintshire, should that be come necessary. It would therefore be useful for the two authorities to work collaboratively on this and, if necessary, for the allocation requirements for Flintshire to be shared.

In view of the surplus of existing permitted crushed rock reserves within Denbighshire, no further allocations for crushed rock are required to be identified within the LDP. In the longer term, however, it may become necessary for Denbighshire to take on a greater share of crushed rock production within the sub-region than is presently the case and, again, there would be merits in collaborative working on this between all three LPAs within the NE Wales sub-region.

Consideration should also be given to whether any of the factors set out in paragraph A58 above give rise to any further requirements for resource allocations within the area.

If any adjustments to the suggested apportionments and allocations are made, they would need to be confirmed within a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within North East Wales are submitted for Examination.

As far as possible, any allocations that are made should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

Paragraph 49 of MTAN 1 notes that landbanks are not required to be maintained within National Parks or Areas of Outstanding Natural Beauty. For this reason, no allocations should be identified within the Bryniau Clwyd AONB, unless there are no environmentally acceptable alternatives.

Use of alternative aggregates

Little or no marine-dredged aggregates are thought to be utilised within Denbighshire.

Slate waste is processed at one remaining active site within the southern part of the Bryniau Clwyd AONB, but the material is believed to be used only as decorative chippings and low grade fill. Other than this, there are no other known sources of secondary aggregate within the county.

There is likely to be some recycled aggregate production from construction, demolition and excavation wastes, primarily within the main coastal towns, but also within some of the quarries.

Despite the limited availability of alternative materials within Denbighshire, the residual requirements for primary land-won aggregates assume that these will continue to form part of the overall supply pattern and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new railheads should be identified for safeguarding within the LDP, in order to provide a full range of sustainable transport options (whether or not they are currently utilised).

FLINTSHIRE

Apportionment for the future provision of land-won primary aggregates

The planning authority is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: **0.223 million tonnes per year** until the end of the Plan period and for 7 years thereafter.
- Crushed rock aggregates provision: **3.359 million tonnes per year** until the end of the Plan period and for 10 years thereafter.

Comparison with existing landbanks

The total apportionments for Flintshire, as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are 4.912 million tonnes for land-won sand & gravel and 83.968 million tonnes for crushed rock. These figures compare with existing landbanks of 1.369 million tonnes for sand & gravel and 48.04 million tonnes for crushed rock (as at 31st December 2016). The figures exclude limestone reserves which are allocated for non-aggregate use.

Allocations required to be identified in the Local Development Plan

In order to address the resulting shortfalls, new allocations totalling at least 3.543 million tonnes of sand & gravel and at least 35.928 million tonnes of crushed rock will need to be identified within the LDP. These are substantial increases compared with the requirements set out in the First Review and, amongst other things, they reflect the resurgent importance of Flintshire in exporting limestone aggregate to North West England. This is clearly demonstrated by the data in Table A2, above. The total allocations required for Flintshire have been minimised by increasing the sub-regional contributions from neighbouring Denbighshire, so as to utilise the existing permitted reserves in that area (see Table 5.2 and associated commentary in the main document). Further collaborative working, with both Denbighshire and Wrexham may be needed to provide optimal solutions.

Any shared arrangements would need to offer advantages, in terms of the proximity principle, environmental capacity and other sustainability criteria, compared with the option of developing new reserves within Flintshire itself. They would also need to be reflected in a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within the North East Wales sub-region are submitted for Examination.

Consideration should also be given to whether any of the factors set out in paragraph A58 above give rise to any further requirements for resource allocations.

As far as possible, allocations should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

Paragraph 49 of MTAN 1 notes that landbanks are not required to be maintained within National Parks or Areas of Outstanding Natural Beauty. For this reason, no allocations should be identified within the Bryniau Clwyd AONB, unless there are no environmentally acceptable alternatives.

Treatment of Dormant sites

A single dormant limestone quarry (Grange) still exists within Flintshire. The planning authority should assess the likelihood of this site being worked within the Plan period, subject to the completion of an initial review of planning conditions and submission of an Environmental Impact Assessment. Where there is a likelihood of reactivation, and where the site is considered by the authority to conform to the definition of 'Specific Sites', as set out in paragraph 14 of Minerals Planning Policy Wales, it may be offset against any requirements that may otherwise be identified as allocations for future working. Subject to such assessment, this may help to address part of the requirement for new crushed rock allocations noted above.

Use of alternative aggregates

Unknown quantities of navigational dredgings from the Dee Estuary are landed at Mostyn Dock, some of which are understood to have been deployed for low specification construction fill. Other than this, no marine-dredged aggregates are thought to be used within Flintshire.

Colliery spoil would once have been available for use as a secondary aggregate within the coalfield area but, in most instances, the area has been redeveloped for use by new, high-tech industries, leaving little further opportunity for generating secondary aggregates on a regular basis.

The relatively high levels of industrial and commercial development and redevelopment (compared with most other parts of North Wales) generate significant quantities of construction, demolition and excavation wastes, from which (currently unknown quantities of) recycled aggregates are derived. Whilst redevelopment has already taken place in many areas, there may be some further opportunities in the south of the county.

The residual requirements for primary land-won aggregates assume that these varying quantities of alternative materials will continue to form part of the overall supply pattern and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new railheads should be identified for safeguarding within the LDP, in order to provide a full range of sustainable transport options (whether or not they are currently utilised).

GWYNEDD

Apportionment for the future provision of land-won primary aggregates

For planning purposes, Gwynedd excludes the Snowdonia National Park, which is a separate Mineral Planning Authority (and is dealt with in combination with neighbouring Conwy, above). Gwynedd is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: **0.174 million tonnes per year** until the end of the Plan period and for 7 years thereafter.
- Crushed rock aggregates provision: **0.995 million tonnes per year** until the end of the Plan period and for 10 years thereafter.

Comparison with existing landbanks

The total apportionments for Gwynedd, as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are 3.834 million tonnes for land-won sand & gravel and 23.867 million tonnes for crushed rock. These figures compare with existing landbanks of 1.175 million tonnes for sand & gravel and 28.54 million tonnes for crushed rock (as at 31st December 2016).

Allocations required to be identified in the Local Development Plan

In order to address the resulting shortfall for sand & gravel, new allocations totalling at least 2.659 million tonnes will need to be identified within the LDP. In view of the small surplus of existing crushed rock reserves, no crushed rock allocations are specifically required. However, consideration should also be given to whether any of the factors set out in paragraph A58 above give rise to any other requirements for resource allocations.

In particular, a sizeable part of the existing crushed rock landbank in Gwynedd is made up of permissions at slate quarries and slate waste tips and, whilst slate aggregate is able to substitute for other rock types in many situations, it is not suitable for all applications. Additional allocations for other types of crushed rock might therefore be required and the situation will need to be kept under close review by the planning authority. Particular attention will need to be given to the continuation (or otherwise) of the exemption of slate from the Aggregates Levy (see para. A19 above). If the exemption is removed there could well be an increased demand for other types of crushed rock aggregate.

As noted in the original RTS, any future crushed rock permissions in Gwynedd may need to be specifically dependent upon justification for material of a particular quality (e.g. rail ballast or road surfacing aggregate) which cannot be met from processed slate waste.

As far as possible, any allocations should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

Paragraph 49 of MTAN 1 notes that landbanks are not required to be maintained within National Parks or Areas of Outstanding Natural Beauty. For this reason, no allocations should be identified within the Llŷn Peninsula AONB, unless there are no environmentally acceptable alternatives.

If any adjustments to the suggested apportionments and allocations are made, they would need to be confirmed within a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within North West Wales are submitted for Examination.

Treatment of Dormant sites

A total of three dormant quarry permissions still exist within Gwynedd, as detailed in Table A5, above. Two of these are slate quarries and one is a sand & gravel site. The planning authority should assess the likelihood of each of these sites being worked within the Plan period, subject to the completion of an initial review of planning conditions and submission of an Environmental Impact Assessment. Where there is a likelihood of reactivation, and where the site(s) in question are considered by the authority to conform to the definition of 'Specific Sites', as set out in paragraph 14 of Minerals Planning Policy Wales, they may be offset against any requirements that may otherwise be identified for allocations for future working. Subject to such assessment, the dormant sand & gravel unit may offer prospects for addressing part of the requirement for new allocations noted above.

Use of alternative aggregates

Small quantities of marine sand are landed at Port Penrhyn near Bangor. These are probably utilised within a radius of 20 to 30 miles within northern Gwynedd and (perhaps) neighbouring Conwy.

As noted earlier in this Appendix, crushed slate, derived either from slate waste or quarried specifically for use as primary aggregate, features significantly in the overall pattern of supply within Gwynedd. Together, over the 10-year baseline period (up to 2016), these products have accounted for an average of 9.7% of total crushed rock sales within North Wales as a whole, falling abruptly since 2009, from a peak of more than 16% in 2007, but recovering to more than 11% by 2016. However, given that slate production is already included in the crushed rock statistics for North Wales, this trend has no implications for the overall level of future demand, only for the balance between slate and other types of crushed rock.

Recycled aggregate production from construction, demolition and excavation wastes within Gwynedd is likely to be limited to small quantities within the main towns and utilised only for local projects.

The residual requirements for primary land-won aggregates assume that all of these alternative materials will continue to be utilised, particularly but not only in the case of crushed slate, and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new railheads should be identified for safeguarding within the LDP, in order to provide a full range of sustainable transport options (whether or not they are currently utilised).

WREXHAM

Apportionment for the future provision of land-won primary aggregates

The planning authority is required to make future provision for land-won primary aggregates within its Local Development Plan on the basis of the following annualised apportionments:

- Land-won sand & gravel provision: 0.646 million tonnes per year until the end of the Plan period and for 7 years thereafter.
- Crushed rock aggregates provision: nil.

Comparison with existing landbanks

The total apportionments for Wrexham, as calculated in Tables 5.4 and 5.6 of the main document, over the 22-year horizon required for sand & gravel, and the 25-year timescale required for crushed rock, are 14.217 million tonnes for land-won sand & gravel and zero for crushed rock. These figures compare with existing landbanks of 12.652 million tonnes for sand & gravel and zero for crushed rock (as at 31st December 2016).

Allocations required to be identified in the Local Development Plan

In order to address the sand & gravel shortfall, new allocations totalling at least 1.565 million tonnes will need to be identified within the Wrexham area.

In recognition of the constraints imposed by the Bryniau Clwyd AONB on the working of crushed rock resources within most of the Wrexham area, the level of crushed rock provision (and thus the requirement for identifying allocations for future crushed rock working) has been set at zero. Small areas of crushed rock resources (both limestone and igneous rock) do exist, however, just outside the AONB in the south-western part of the area, and the possibility remains of identifying prospects for future extraction in those areas. If any such opportunities do arise, it may be possible for Wrexham to share part of the crushed rock allocation currently assigned to neighbouring Flintshire.

Any such shared arrangements would need to offer advantages, in terms of the proximity principle, environmental capacity and other sustainability criteria, compared with the option of developing new reserves within Flintshire. They would also need to be reflected in a Sub-regional Statement of Collaboration, and agreed with the North Wales RAWP, before any of the constituent LDPs within the North East Wales sub-region are submitted for Examination.

Consideration should also be given to whether any of the factors set out in paragraph A58 above give rise to any further requirements for resource allocations.

As far as possible, any allocations should be identified as Specific Sites or, failing that, as Preferred Areas. If, as a last resort, it is only possible to identify broad Areas of Search, these should be sufficient to offer the potential of much greater quantities of reserves, in order to reflect the uncertainties involved.

Paragraph 49 of MTAN 1 notes that landbanks are not required to be maintained within National Parks or Areas of Outstanding Natural Beauty. For this reason, no allocations should be identified within the Bryniau Clwyd AONB, unless there are no environmentally acceptable alternatives.

Use of alternative aggregates

Little or no marine-dredged aggregate is thought to be utilised within Wrexham, not least because of the extensive and accessible reserves of land-based sand & gravel within the area.

As noted in the original RTS, slag banks were periodically processed at the former Brymbo Steelworks for construction fill and colliery spoil heaps were utilised as embankment fill, but neither of these sources of secondary aggregate are now available. Similarly, a substantial amount of derelict land and buildings associated with the former mining and clay products industries, e.g. around Ruabon, has been cleared and other tips have been reprofiled leaving little scope for generating further material from such sources.

As in Flintshire, relatively high levels of industrial and commercial development and redevelopment (compared with other parts of North Wales) generate significant quantities of construction, demolition and excavation wastes, from which (currently unknown quantities of) recycled aggregates are derived. Significant further redevelopment is anticipated in the years ahead and this source of alternative aggregates is therefore likely to continue.

The residual requirements for primary land-won aggregates assume that all available alternative materials will continue to be utilised and the authority should continue to encourage this.

Safeguarding of primary aggregate resources

Relevant resources of both crushed rock aggregates and land-based sand & gravel have been safeguarded within the LDP, in accordance with detailed advice based on the use of British Geological Survey mapping, prior to the publication of the BGS safeguarding maps.

Safeguarding of wharves and railheads

All existing and potential new railheads should be identified for safeguarding within the LDP, in order to provide a full range of sustainable transport options (whether or not they are currently utilised).