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E.0 Executive Summary

E1. The National Planning Policy Framework (NPPF) requires the County Council, as Mineral Planning authority (MPA), to prepare a Local Aggregates Assessment (LAA) in order to identify possible future requirements for aggregates i.e. the demand for and supply of aggregates.

E2. This should take into account:
- **primary aggregate resources** (land won crushed rock and sand and gravel and marine dredged aggregates);
- **alternative aggregates** (recycled and secondary aggregates), wharf and rail facilities and the import and export of aggregates.

E3. National and local guidelines for aggregates provision in England 2005-2020 and any sub-national apportionment of these to MPA level are to be used only as indicative amounts of what should be provided. The annualised apportionment amounts for 2005-2020 that have been identified for Gloucestershire in technical advice from the South West Aggregates Working Party are 2.25mtpa for crushed rock and 1mtpa for sand and gravel.

E4. The NPPF and subsequent guidance on LAAs and the Managed Aggregates Supply System (MASS) in general indicates that in the first instance the LAA should be based on a rolling average of 10 years’ sales data and other local information but, as necessary, informed by the average of 3 years' sales data to indicate general trends.

E5. Gloucestershire’s sales of crushed rock over the 10 year period 2002-2011 have averaged 1.68mtpa but have fallen from just over 2mt in 2002 to only 1.3mt in 2011. Sales of sand and gravel have averaged 0.85mtpa over the same period but have been more consistent, generally having been just under 1mtpa throughout the period.

E6. Gloucestershire has a strategically important crushed rock aggregates industry in the Forest of Dean (FoD) and in the Cotswolds where Carboniferous and Jurassic limestones are quarried and a similarly important sand and gravel industry located primarily in the Upper Thames Valley (UTV) on the border with Wiltshire. The current economic recession appears to have had a greater effect on sales of crushed rock in the last few years but these have also been affected by the mothballing of a large quarry in the Forest of Dean.

E7. The consistent sales of sand and gravel have been partly due to considerably lower sales from sand and gravel pits in the Wiltshire part of the UTV, the industry in the UTV also showing cyclical changes in sales on either side of the MPAs’ common boundary as sand and gravel pits tend to be shorter term operations than crushed rock quarries.
E8. At the end of 2011 reserves of crushed rock in the FoD and in the Cotswolds were about 31mt but those for sand and gravel amounted to only 6.75mt. The NPPF requires minimum landbanks for aggregates to be maintained to help ensure a steady and adequate supply of these essential construction materials; these are 10 years for crushed rock and 7 years for sand and gravel. The guidance on LAAs and the MASS requires these landbanks to be based on the past 10 years’ average sales.

E9. Using the average sales for the 10 year period 2002-2011 (1.68mt for crushed rock and 0.85mtpa for sand and gravel) the landbanks in Gloucestershire are 18.5 years and 7.9 years respectively.

E10. This LAA identifies a potential countywide shortfall in reserves of crushed rock in about 2021, when based on a productive capacity of 1.68mtpa but a shortfall in sand and gravel reserves by c.2013 when based on a productive capacity of 0.85mtpa.

E11. Whilst landbanks exceed the NPPF minima, the county’s reserves are not evenly distributed between individual quarries which also have different levels of output. Accordingly sites have different life expectations which in turn means that without reserves being replenished the cumulative productive capacity of the primary aggregates industry in the county is likely to decline with a commensurate effect on the ability of the industry to maintain a steady and adequate supply of aggregates.

E12. Assuming a Minerals Local Plan period to 2030 (15 years from the proposed year of adoption) and when based on the 10 year rolling sales average and permitted reserves at the end of 2011, there is a shortfall of 17.61mt of crushed rock and a shortfall of 15.35mt of sand and gravel in 2030.

E13. The production of recycled aggregates in the county and the importation of land won and marine dredged aggregates from adjacent areas are likely to continue to make useful contributions to the consumption of aggregates in Gloucestershire which will mainly be met by the extraction of indigenous aggregates. The analysis and assessment of the evidence used in this LAA indicates that the use of the 10 year rolling sales average for both crushed rock and sand and gravel is a robust basis on which to base the forecast of demand but exports of sand and gravel, in particular from the UTV, may increase if there is insufficient provision in neighbouring MPAs.

E14. In the first instance the Council will consult with the aggregates industry, Local Enterprise Partnerships and adjacent Mineral Planning Authorities in order to further inform the technical evidence base and the analysis and assessment that has been undertaken. The Council will also submit the LAA to the South West Aggregates Working Party for consideration as advised by the DCLG in its October 2012 guidance on the Managed
Aggregates Supply System. Following this process, the LAA may be amended and a further draft will be produced for wider stakeholder consideration.

E15. This process will then be tested through the preparation of the revised Gloucestershire Minerals Local Plan through 2013 to its anticipated adoption in 2016. It should be noted that the LAA is subject to annual review therefore this version is produced as a starting point in line with the Guidance.

E16. The LAA is accompanied by the ‘First Baseline Report to the Local Aggregates Assessment for Gloucestershire 2013’. This produces baseline data and more detailed information which underpins the LAA. This report will also be subject to review but it is anticipated that some sections are less likely to change annually unless source information changes. For example much of the export information can only be reviewed following the 4-yearly survey which is commissioned by Government, the last of which covered 2009 data. For the purposes of the LAA this more detailed report will be refreshed as the ‘Baseline report’ and readers are pointed towards relevant sections as appropriate.
1.0 National Planning Policy Framework

1.1 The National Planning Policy Framework (NPPF) (March 2012) requires mineral planning authorities (MPAs), to plan for a steady and adequate supply of aggregates and to prepare an annual Local Aggregates Assessment (LAA). This can be done either individually or as a joint LAA with another or other MPAs. The LAA is to be based on a rolling average of 10 years sales data, an approach that is supported by industry which considers that it reflects the true supply and demand situations, and ‘other relevant local information’ and should include an assessment of all supply options (including marine dredged, secondary and recycled sources). Though not explicitly stated, the NPPF and its requirement for LAAs apply only to England.

1.2 In October 2012 DCLG issued further guidance on LAAs which expanded on the NPPF. This includes a specific requirement for MPAs to seek to provide an assessment of the demand for and supply of aggregates in an MPA’s area based on supply options that include recycled and secondary aggregates, marine sources and land won resources but also ‘to capture the amount of aggregate that it is importing and exporting as part of its Assessment’. Forecasting future demand for aggregates by using the average of 10 years’ sales data and other relevant local information is qualified in this guidance which also cites the annual National Infrastructure Plan as being a source of information on construction activity and which requires MPAs to look at the average of 3 year sales in particular to identify the general trend of demand as part of the consideration of whether it might be appropriate to increase supply.

1.3 Before the advent of the NPPF and the need for LAAs, MPAs used national and regional forecasts for the provision of aggregates to plan for the supply of these construction materials. Regional amounts were apportioned to constituent MPAs as a Sub Regional Apportionment (SRA) which were then to be planned for unless local considerations justified the use of alternative amounts. The apportionments are still to be used by MPAs but only as indicative amounts for future provision.


2 Aggregates as defined in European Standard (EN 12620:2002) are defined as ‘granular material used in construction. Aggregate may be natural, manufactured or recycled’, natural aggregate is aggregate from mineral sources which has been subject to nothing more than physical processing (crushing and/or sizing); manufactured aggregate is aggregate of mineral origin resulting from an industrial process involving thermal or other modification e.g. slag; recycled aggregate is aggregate resulting from the processing of inorganic materials previously used in construction e.g. construction and demolition waste. In Britain it is common practice to distinguish between primary (natural) aggregates and alternative sources such as secondary aggregates (aggregates produced as a by-product to the main mineral e.g. slate waste/china clay waste) and recycled aggregates. Natural aggregate is most commonly crushed rock (C/R) or sand and gravel (S/G). Hard rock, with suitable physical properties, is preferred as a source of crushed rock aggregate and High Specification Aggregates (HSA) are those used in demanding applications such as skid resistant road surfacing aggregate.

3 Guidance on the Managed Aggregates Supply System DCLG October 2012
The context to the National and Regional Guidelines is shown in Section 2 of the Baseline Report.

1.4 This draft LAA has been produced for consultation but once it has been finalised it will be used to supplement the evidence base of Technical Papers that will support the policies and proposals for aggregates in the Council’s draft Minerals Local Plan (MLP); this plan will guide mineral development in Gloucestershire to 2030. The preliminary work that has been carried out since 2006 on a new minerals plan for Gloucestershire to replace the minerals element of the adopted development plan (comprising the Structure Plan 2nd review (1999) and the Minerals Local Plan (1997-2006) has also been taken into account in this draft.

1.5 In preparing its LAA and Minerals Local Plan and in accordance with the NPPF the Council will also take account of the advice of the South West Aggregates Working Party and the National Co-ordinating Group\(^4\) as appropriate and will use the published National and Sub National Guidelines on the future provision of aggregates in England as guidelines.

1.6 The County Council considers that information on the following should be used to inform the LAA for Gloucestershire:

- provision for aggregates supply at the sub national and MPA levels in England and in South Wales;
- the geological resources of Gloucestershire;
- the location of active and inactive permitted workings;
- the sales and permitted reserves of primary aggregates;
- the existing and potential capacity of mineral workings to supply aggregates;
- the location and potential yield of allocated areas for aggregates extraction in the adopted Minerals Local Plan;
- rail linked aggregate sites/depots and wharves and their potential to contribute to the supply of aggregates;
- fixed recycled aggregates sites and sources of secondary aggregates and their potential to contribute to the supply of aggregates
- existing and future markets served by the local aggregates industry;
- existing and potential supplies of aggregates to local and other markets by sources outside the home MPA, including marine sources.

\(^4\) Aggregate Working Parties (AWP) were set up in the early 1970’s and their membership is essentially drawn from MPAs, the aggregates industry and central government. The National Co-ordinating Group guides the work of the AWPs and has a similar membership base.
2.0 Provision for Primary Aggregates Supply in Adjoining Regions and MPAs and in South Wales

2.1 Gloucestershire has a close geographical relationship with MPA areas in South Wales, the West Midlands and the South East as well as other MPAs in the South West and it is known from surveys that the cross border movements of aggregates do occur as exports from the county and imports into Gloucestershire from other MPA areas. The movement of aggregates between source and market depends on their availability relative to the location and level of demand for them and their delivered price. Aggregates are generally widespread in England and in Wales and road marketing radius is normally in the order of about 40km; however, bulk transport by rail can extend this distance. Accordingly it has been necessary to give consideration in this LAA to the forecasts for the future provision of aggregates by those areas either as SRAs, in an LAA or through another means.

2.2 The information from this LAA investigation confirms that the important points for Gloucestershire are that:

- The SRAs for the county for the period 2005-2020 are 2.25mtpa for crushed rock and 1mtpa for sand and gravel.
- There are important flows of sand and gravel from workings in the Upper Thames Valley (UTV) resource area in Gloucestershire for use in Wiltshire and, to a lesser extent, in Oxfordshire.
- Crushed limestone from the Forest of Dean is primarily marketed in Gloucestershire but also in South Wales and the West Midlands.
- Crushed limestone from the Cotswolds is marketed in Gloucestershire but also to some extent in the West Midlands and in Oxfordshire.
- The county imports significant amounts of crushed limestone from the former Avon area (now West of England).

2.3 Detailed information on the sub national situations is provided in Section 3 of the Baseline Report. In summary the analysis and assessment of this information has not suggested that there is any particular reason why the Council should make any adjustment to the contributions of primary aggregates from Gloucestershire on technical grounds. The following provides a discussion of LAA forecasts which will need to be considered through the review of the MLP.
3.0 The Approach to a Local Aggregates Assessment for Gloucestershire

3.1 The LAA approach now advocated in the NPPF requires an LAA to be based on a rolling average of 10 years sales data. This is considered to give a reasonable indication of the ‘actual’ demand on an MPA area as it evens out the usual peaks and troughs of production that can occur annually due to normal fluctuations in construction activity more reliably than if a shorter period were to be used. However, some South West MPAs have used a variation to this approach e.g. Devon and Dorset (Baseline Report Section 3) and the more recent guidance on the Managed Aggregates Supply System (MASS) and LAAs (October 2012) now includes a requirement for MPAs to consider also the average 3 years’ sales.

3.2 The annual sales of crushed rock and sand and gravel in Gloucestershire for the period 2002-2011 inclusive and the resultant averages over this period are shown in Table 3.1.

Table 3.1. Gloucestershire Crushed Rock C/R and Sand and Gravel S/G Production 2002-2011(mt)  

<table>
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<tr>
<th></th>
<th>2002</th>
<th>2003</th>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<td>0.93</td>
<td>0.9</td>
<td>0.85</td>
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3.3 The more recent guidance does not specify which 3 year period should be considered but it is assumed to be the last three years of available data. In Gloucestershire the average sales of crushed rock for 2009-2011 was 1.22mtpa and for sand and gravel it was 0.89mtpa. The general downturn in demand for aggregates due to the economic recession since 2008 will have affected the level of quarrying in the county but for sand and gravel the 3 year sales average is slightly higher than the 10 year average. It is believed that this was due to lower sales from pits in Wiltshire being offset by higher sales in the county, a supply situation that may or may not rebalance itself in time. In the case of crushed rock the lower average is probably a more accurate reflection of the effects of the recession but it may also be attributable in part to the mothballing of Drybrook Quarry in 2008 and the possible transfer of production to quarries in South Gloucestershire within the same company ownership (Hanson).

3.4 In the case of sand and gravel because the recent 3 year sales average does not differ greatly from the 10 year sales average of 0.85mtpa it is

5 SWAWP Annual Reports
considered to be a reasonable estimate upon which to base a forecast for this aggregate. Although the 3 year average for crushed rock is slightly lower than the 10 years sales average, taking into account the higher production up to 2008 when Drybrook Quarry in the Forest of Dean was mothballed, the 10 years sales average of 1.68mtpa would appear to be a reasonable and appropriate amount on which to base future crushed rock supply in the county.
4.0 Aggregate Supply Options

4.1 The October 2012 DCLG guidance on LAAs requires that consideration should be given to supply options that include recycled and secondary aggregates, marine sources and imports and exports of aggregates out of the MPA area as well as to the county’s land won resources (paragraph 10 of the guidance). Sections 4 and 5 of the Baseline Report provide information on the land won sand and gravel and crushed rock resources and industries in Gloucestershire. Details of the apportioned or otherwise planned provision to be made in sub national areas and their MPAs are provided in Section 7 of the Baseline Report.

4.2 As regards imports and exports the AM09 collation\(^6\) indicates that in 2009 Gloucestershire ‘consumed’ 1.375 million tonnes of primary aggregate. This comprised c.0.353 million tonnes of land won sand and gravel; c.0.05 million tonnes of marine dredged sand and gravel and c.0.975 million tonnes of crushed rock. When compared to the sales (production) of aggregates from the county (0.93 million tonnes of sand and gravel and 1.17 million tonnes of crushed rock) these figures show that Gloucestershire was a net exporter of both types of aggregate as total consumption was only c.65% of production and they confirm the county’s net exporting role that was shown by earlier AM surveys.

4.3 Information in AM09 also shows that of the county’s crushed rock sales, 0.61mt (52%) were marketed in Gloucestershire but only 0.14mt (12%) were marketed elsewhere in the South West. However, 0.42mt (36%) were sold elsewhere, probably in the near South East, West Midlands and South Wales counties because of the close proximity of the two crushed rock resource areas in Gloucestershire to these markets. Conversely only 0.12mt (19%) of sand and gravel were marketed in the county with 0.48mt (52%) having been sold elsewhere in the South West, probably Wiltshire and the former Avon area with 0.28mt (30%) going to other destinations, probably the near South East counties, again because of the close proximity of the UTV resource area to these market areas.

4.4 This cross border movement of aggregates is a feature of the industry but the degree to which it takes place and the particular areas involved may change because demand and supply are dynamic. Should permitted reserves of crushed rock or sand and gravel in the county become exhausted or production curtailed for any other reason it is feasible that because of the close proximity to Gloucestershire of some resource areas which have an existing or potential trading relationship with the county a greater proportion of supplies of these aggregates

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\(^6\) This refers to the 4 yearly ‘Aggregates Minerals survey commissioned by Government.
could be sourced from permitted reserves at quarries in nearby MPA areas to help supply future construction needs in the county in the same way that the county’s industry could be called upon to contribute to the supplies needed in other areas should the reverse apply.

4.5 The degree to which this might happen will be subject to the economics of quarrying and the suitability of the aggregates, the commercial willingness of the industry and the availability and location of the permitted reserves.

4.6 Imports of land won sand and gravel in 2009 amounted to only 0.18mt. These were most likely to have come from the nearby industry in Wiltshire and Swindon’s part of the shared UTV resource where permitted reserves are even less than those in the county but where the MPAs are proposing to allocate further land for quarrying. Crushed rock imports were higher but were only 0.37mt; these were probably from quarries in South Gloucestershire via the M5. Overall the information on potential crushed rock supplies from other areas suggests that if shortfalls were to materialise in the supply of crushed rock aggregates from Gloucestershire then nearby MPA areas to the north and west of the county, but particularly to the south in South Gloucestershire, would most likely make up any reduction in supplies from the county subject to the economics of quarrying and the commercial willingness of the industry. At a strategic level it is likely that the industry in South Gloucestershire would have the greatest potential for additional supplies, a supply scenario that was being investigated by the South West Regional Assembly.

4.7 The county has no marine dredging industry and very little marine sand and gravel is imported into Gloucestershire. Similarly there are no rail linked quarries and no active aggregate rail depots that could be used for the export or import of aggregates. However, there is some potential for both marine and rail developments.

4.8 With regard to recycled and secondary aggregates it is the former, locally based industry that would appear, at the moment, to have the greatest potential in supplementing the supply of primary aggregates but there is little information on its current contribution or its future potential and a 2012 survey of local operators for the purposes of this LAA did not produce any useful information.

4.9 More recent surveying of C&D operators in 2011 suggests c.100,000mtpa of C&D materials may have been used as a substitute for primary minerals. Facilities that produce recycled aggregates are concentrated primarily in the urban areas, though some active primary aggregates quarries also produce them in order to supplement their principal production stream and husband their primary aggregate resources. The potential of recycled aggregates to contribute to more to
meeting local demand for aggregates is limited by both their limited technical ability to meet specification for particular end uses, although this is improving, and by the availability (quantity and quality) of the C&D wastes that are suitable for processing.

4.10 Further details on these existing and potential supplies are continued in Sections 7 and 9 of the Baseline Report. It should be noted that the National and Regional Guidelines for Aggregates Provision in England 2005-2020 (see Baseline Report Section 2) provides assumptions for contributions to supply from marine sand and gravel and alternative materials. The analysis and assessment of the evidence currently available suggests that the contribution from these sources in Gloucestershire does not lead to a conclusion that a variation to the primary aggregates forecasts is necessary.
5.0 Future Demand for Gloucestershire’s Primary Aggregates

5.1 By using the average of the previous 10 years’ production for crushed rock and sand and gravel as an indication of actual demand for each, and projecting the amounts forward over the plan period with an intention to provide for the maintenance of 10 year and 7 year landbanks (Baseline Report Section 8) for crushed rock and sand and gravel respectively throughout and at the end of the plan period, it is possible to ‘forecast’ the amount of material that will be needed in addition to permitted reserves. The amounts would provide a contribution of primary aggregates for consumption in Gloucestershire and a proportion of the primary aggregates to be consumed elsewhere.

5.2 Table 3.1 shows the production data that have been used to calculate the 10 year averages of 1.68mtpa for crushed rock and 0.85mtpa for sand and gravel. These amounts are respectively 25% and 15% lower than the annualised indicative amounts that were apportioned to the county by SWAWP for crushed rock (2.25mtpa) and for sand and gravel (1mtpa) and which were based on the 2005-2020 Sub National Aggregate Guidelines.

5.3 Tables 5.1 and 5.2 show the drawdown on permitted reserves throughout a 20 year plan period (2011-2030) that would result from the provision of 1.68mtpa of crushed rock and 0.85mtpa of sand and gravel. For crushed rock the maintenance of a 10 year landbank during and throughout the period would require an additional permitted reserve of 17.61mt but for sand and gravel an additional 15.35mt of permitted reserves would be necessary to maintain a 7 year landbank. If the MPA apportionments identified by SWAWP are used (2.25mt for crushed rock and 1.0mt for sand and gravel) then the additional amounts of permitted reserves that would be required to maintain the respective landbanks would be commensurately higher, all the more so in the case of crushed rock.

5.4 It must be stressed, however, that these tables only demonstrate the ability of the gross amount of permitted reserves as at 2011 and the additional provisions for reserves that would be required in order to maintain and appropriate landbank throughout and to the end of the plan period based on a specified average production level. This approach does not illustrate the inevitable changes to productive capacity that will result over the period due to the uneven distribution of permitted reserves between quarries, the unequal levels of production they currently demonstrate and which are likely to change in reaction to market and other considerations and the possible reopening of quarries e.g. Drybrook Quarry in the Forest of Dean.

5.5 Monitoring of production levels will indicate trends and whether the figures should be increased or decreased in subsequent LAAs. Figures 5.1 and 5.2 show historic sales (2002-2011) and a comparison of
crushed rock and sand and gravel amounts for the period 2011-2030 using the average of 10 years' sales and the annualised apportionments of 2.25mtpa for crushed rock and 1mtpa for sand and gravel- derived from Table 3.1 of the Baseline Report.

5.6 Using the average of 10 years' sales for forecasting, the existing permitted reserves (as at 31/12/11) are insufficient to meet the required amounts and to provide for the maintenance of landbanks for both crushed rock and land won sand and gravel. For crushed rock on a countywide basis additional reserves would begin to be needed around 2021 but for sand and gravel the situation is far more urgent with additional reserves being required almost immediately (2013). However, before those dates additional reserves will be needed at some quarries if production capacity is not to be substantially reduced. If the annualised apportionment amounts were to be used (2.25mtpa for crushed rock and 1mtpa for sand and gravel then the urgency to release further reserves would be even greater.

5.7 The government’s guidance on the MASS includes a requirement to consider other local information, including developments listed in the National Infrastructure Plan, to indicate possible demand for aggregates. However the Plan for 2011 does not identify any major construction activities in the county or in its immediate hinterland that might have a significant effect on future supplies of aggregates other than possible, though unspecified, improvements to the M4 in South East Wales.

5.8 Significant infrastructure proposals that might directly or indirectly affect future production of aggregates in Gloucestershire include the development of nuclear facilities at Oldbury Power Station on the Severn Estuary and at Hinkley Point further downstream in Somerset and the possibility of a Severn Barrage. These projects, especially the latter, would require enormous amounts of aggregates the supply of which could have implications over a wide area and potentially within Gloucestershire.
Table 5.1: Landbank calculations for Crushed Rock for a Local Plan period of 2012-2030 inclusive

<table>
<thead>
<tr>
<th>Year</th>
<th>Reserves at start of year (mt)</th>
<th>Additional reserves required to maintain a 10 yr landbank (16.8mt)</th>
<th>Draw down during year (mt) (based on ten year average 02-11)</th>
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<tr>
<td>1/2012</td>
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<td>1.68</td>
</tr>
<tr>
<td>2030</td>
<td>0.87</td>
<td>15.93</td>
<td>1.68</td>
</tr>
<tr>
<td>1/2031</td>
<td>-0.81</td>
<td>17.61</td>
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</table>

Totals | 31.92 |
Table 5.2: Landbank calculations for Sand and Gravel for a Local Plan period of 2012-2030 inclusive

<table>
<thead>
<tr>
<th>Year</th>
<th>Reserves at start of year (mt)</th>
<th>Additional reserves required to maintain a 7 yr landbank (5.95mt)</th>
<th>Draw down during year (mt) (based on ten year average 02-11)</th>
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</thead>
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<tr>
<td>1/2012</td>
<td>6.75</td>
<td>0</td>
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<tr>
<td>2013</td>
<td>5.9</td>
<td>0.05</td>
<td>0.85</td>
</tr>
<tr>
<td>2014</td>
<td>5.05</td>
<td>0.9</td>
<td>0.85</td>
</tr>
<tr>
<td>2015</td>
<td>4.2</td>
<td>1.55</td>
<td>0.85</td>
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<tr>
<td>2016</td>
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<td>2.6</td>
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<tr>
<td>2017</td>
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<td>3.45</td>
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</tr>
<tr>
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<td>2019</td>
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<td>5.15</td>
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<tr>
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<td>-0.05</td>
<td>6.00</td>
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<tr>
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<td>0.85</td>
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<td>1/2031</td>
<td>-9.4</td>
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<td>0.85</td>
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<tr>
<td>TOTALS</td>
<td></td>
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<td>16.15</td>
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</table>

5.9 If the SRA average of 2.25mtpa for crushed rock and 1mtpa for sand and gravel are used to calculate the additional reserves needed to maintain the same landbanks for crushed rock and sand and gravel over the plan period to 1/2031 and beyond, then higher additional crushed rock reserves of 34.14mt and 19.25mt of sand and gravel would be needed.

5.10 In the case of sand and gravel, the 10 years sales average is only 0.15mtpa (15%) less than the annualised SRA amount but throughout the period annual sales have regularly alternated between exceeding or being below the average level of sales in the range +/-c.20%. Only in 2005 did sales reach the annualised SRA amount (Figure 5.1). In the 3 year period 2008-2011 sales were maintained despite the recession though this was probably due in part to a fall in sales in Wiltshire being offset by a higher than expected production level in Gloucestershire. Had Wiltshire’s sales been maintained at pre 2008 levels Gloucestershire’s sales during this period might have depressed the 10 year average to below 0.85mt. The County Council therefore considers
that the 10 year sales average should be used to plan for the future provision of sand and gravel in the county. Taking account of the January 2012 reserve of 6.75mt there is an additional provision of 15.35mt which will be required to maintain an annualised rate of 0.85mt and a 7 year landbank throughout the plan period to 2030.

5.11 Conversely, as shown in Fig 5.2, sales of crushed rock over the 10 year period have never reached the SRA annualised amount which is considerably higher (+34%) than the 10 year sales average. Until c.2008, however, when Drybrook Quarry in the Forest of Dean was mothballed and sales then fell c.30% below the 10 year average, they had always exceeded the 10 year average. Monitoring will show if sales levels do recover but the County Council considers that of the two amounts the 10 year sales average is the more realistic figure that should be used to plan for the future provision of crushed rock. If this is done on the basis of a 2012 crushed rock reserve of 31.11mt then an additional requirement of 17.61mt is needed to provide for sales at an annualised rate of 1.68mtpa and to maintain a 10 year landbank throughout and to the end the MLP period to 2030 and for 10 years beyond.

5.12 The issue of ensuring that there is sufficient productive capacity to achieve the annual outputs of crushed rock and sand and gravel over the plan period is a matter that will be addressed in the MLP.
Fig 5.1: Sand and Gravel Production v Annualised SRA and 10 Year Average

Million Tonnes

Year


S/G sales  S/G Apportionment  S/G 10 yr Av
Figure 5.2: Crushed Rock Production v Annualised SRA and 10 Year Average
6.0 **Allocation of LAA requirements for Crushed Rock and Sand and Gravel to Resource Zones (Forest of Dean, Cotswolds; UTV, Severn Vale)**

6.1 Although the crushed rock quarries of the Forest of Dean and the Cotswolds produce aggregates, the Forest of Dean area has historically been responsible for the greater proportion of output. Quarries there have a greater yield per unit area and also work a physically superior aggregate resource (Carboniferous limestones) which is capable of meeting the specifications demanded by most crushed rock end uses. The softer Jurassic limestones that are worked in the Cotswolds generally have a more restricted range of aggregate applications but nevertheless have aesthetic qualities e.g. colour, that cannot be met by the Carboniferous limestones. Only two quarries in the Cotswolds focus on the production aggregates; the majority of Cotswold quarries concentrate on building stone production and, if at all, produce only small amounts of aggregate as a secondary material. The crushed rock aggregate quarries in the Cotswolds therefore provide an important input to supplies, partly because their location on the eastern side of the county helps to balance supplies from the Forest of Dean quarries on the west side.

6.2 Further reserves of about 17.6mt (Table 5.1) would be needed countywide if the approach to future supplies of crushed rock is based upon the average of 10 years' sales. But for the reasons outlined above, to maintain customer choice and to spread the environmental load of quarrying between the resource areas the maintenance of separate landbanks for crushed rock aggregates in both locations is considered to be appropriate.

6.3 Surveys have shown that historically the % split in the production of aggregates between the Forest of Dean and the Cotswolds resource zones is roughly 70:30 and if this is applied to the reserves that would be needed for production at 1.68mtpa for the period of the plan to 2030 and for 10 years after (48.72mt total), then the amounts required from each resource zone would be 34.1mt from the Forest of Dean and 14.62mt from the Cotswolds. Permitted reserves in the Forest of Dean and in the Cotswolds were 19.38mt and 11.73mt respectively at the beginning of 2012 (total 31.11mt) thus additional reserves of 14.72mt would be required for the Forest of Dean and 2.89mt would be required for the Cotswolds. Therefore this would be the starting point for what provision is required for crushed rock and the allocations to be made in the Minerals Local Plan.

6.4 For sand and gravel there are similar ‘technical differences’ between resource zones, in particular the aggregates capabilities of the mainly sharp sand and gravel found in the main resource zone, the Upper Thames Valley, and the small scale sand and gravel operations in the
Severn Vale and northern part of the county which include soft sands. Soft sands can be used for some sharp sand applications but sharp sands cannot generally be used for soft sand end uses; there are also some differences in the end uses between the sharp sand and gravel deposits in the UTV and those in the Severn Vale. Data supplied to the MPA indicates that in recent years the UTV quarries have been responsible for about 98% of sand and gravel sales with quarries outside this resource zone in the Severn Vale historically contributing only about 2% to production.

6.5 Although the sharp and soft sands are quarried to serve different purposes there is some degree of interchangeability but as the contribution to aggregate supplies that is made by the soft sand industry in the county is almost negligible a separate landbank for soft sand is not considered to be necessary. Similarly the differences between the sharp sand and gravel deposits in the UTV and Severn Vale are not considered to be so great as to warrant separate landbanks; the sands that are quarried in the Severn Vale do not have a distinct and separate market such as to warrant a separate landbank. Only a countywide landbank for sand and gravel is therefore proposed.

6.6 Table 5.2 shows that by using the average of 10 years’ sales approach to forecasting a shortfall in reserves of 15.35mt results at 2030 if a 7 year landbank is to be maintained throughout and beyond the plan period. The Minerals Local Plan would need to look to identify sufficient allocations in order to meet the additional quantum of resources.
7.0 7. Areas of Outstanding Natural Beauty (AONB)

7.1 An important consideration that is particularly pertinent with respect to the supply of crushed rock aggregates in Gloucestershire is the requirement, in paragraph 144 of the NPPF, that as far as is practical local planning authorities should provide for the maintenance of landbanks of non-energy minerals from outside AONBs. In Gloucestershire approximately 25.57mt (82%) of the county’s 31.11mt of crushed rock reserves are located within the two AONBs (Wye Valley AONB and Cotswolds AONB). It is not possible to identify the reserves within each AONB because of confidentiality restrictions but most of the reserves are associated with the Wye Valley AONB in the Forest of Dean Carboniferous Limestone crushed rock resource area.

7.2 However, parts of the Forest of Dean resource area do lie outside the AONB so here there is some scope for meeting the above requirement but in the Cotswolds the boundaries of the AONB encompass most of the Jurassic limestone resource.

7.3 Although the Council is mindful of the guidance and has and will continue to have a preference for working non AONB resources the maintenance of a steady and adequate supply of aggregates may mean identifying future provision from within AONBs, especially from the Cotswolds where there are limited alternative supply options. In the non AONB parts of the Forest of Dean there are more options and these will be explored through the MLP review.
8.0 Deliverability of ‘forecast’ requirements by Gloucestershire quarries

8.1 The deliverability of future requirements for construction aggregates is crucial to achieving a steady and adequate supply and depends only in part on the industry having access to sufficient total reserves for the duration of the plan. Having access to adequate reserves for an appropriate period at individual sites is also important in order to maintain productive capacity (See Section 6 of the Baseline Report).

Remaining MLP allocations and other Resources

8.2 With regard to total reserves, countywide permitted reserves could also be supplemented by the remaining resources in sites that are identified for future working in the adopted Minerals Local Plan 2003, some of which are contiguous with active quarries. Subject to successful planning applications the resultant reserves would then add to the county’s aggregates capital if the investigations by the Council prove these to be suitable for rolling forward for allocation in the replacement MLP.

8.3 The adopted MLP identifies seven crushed rock preferred areas at five sites, four at three sites in the Forest of Dean and three at two sites in the Cotswolds. Since these preferred areas were first identified areas at Clearwell and Stowfield quarries have been permitted as extensions to the quarries. At the time of preparing this paper (Autumn 2012), the potential remaining yield of aggregates from unworked crushed rock preferred areas amounted to 4.5mt for Carboniferous limestone in the Forest of Dean and 17.2-20.3 mt of Jurassic limestone in the Cotswolds.

8.4 For sand and gravel the adopted MLP identifies seven preferred areas in the UTV resource area. Since 2003 preferred areas at Dryleaze Farm and Horcott have been permitted as extensions to existing quarries and at the time of preparing this paper the unworked sand and gravel resources in the preferred areas amounted to approximately 8.6mt.

8.5 As part of the preparation of the replacement MLP the County Council will review the remaining preferred areas to assess whether they are needed and are suitable for future extraction and therefore should be rolled forward for allocation in the new plan. Even if all of the Preferred Areas from the 2003 MLP were deemed to be suitable for rolling forward into the MLP review there would be insufficient allocations to ensure a steady and adequate supply of aggregates from the Forest of Dean crushed rock resource area and for sand and gravel supply in general.
8.6 Other potential sources of aggregates that may be referred to the Council will also be considered during the development of the plan. An earlier Call for Strategic Sites in 2010\(^7\) resulted in several additional sites being proposed by landowners and the minerals industry. However, these will need to be assessed for technical and environmental suitability before they can be considered for allocation for future aggregate provision. This will need to be tested through the preparation of the review of the Minerals Local plan and be the subject of stakeholder and public engagement. Consultation on site options is anticipated to take place in late 2013/early 2014.

\(^7\) The Council’s 2010 Call for Strategic Sites proposed that the qualifying criterion for a site would be a minimum resource of c.0.5-1mt of sand and gravel and for crushed rock a minimum of c.4.5mt. Sites with a smaller potential yield would be considered against site suitability criteria.
9.0 Conclusions

9.1 By using the 10 year average sales approach for assessing a future level of provision for aggregates over the Plan period, annual productive capacities of 1.68mtpa and 0.85mtpa have been calculated for crushed rock and sand and gravel respectively. In order to maintain these levels throughout the MLP period and for 10 years and 7 years thereafter for crushed rock and sand and gravel respectively, additional reserves of 17.61mt for crushed rock and 15.35mt for sand and gravel have been calculated. This approach, though less demanding on local resources than the more optimistic ‘indicative’ forecasts derived from the apportionment of the national guidelines does not look forward to assess what the future demand for aggregates might be but assumes that past performance (i.e. actual sales) is a reasonable indicator of what may be required. Changes in the level of construction locally and elsewhere and in the availability of permitted reserves in other MPA areas, particularly in adjacent areas such as Oxfordshire and Wiltshire/Swindon, will challenge the veracity of this approach and under or overprovision of reserves in Gloucestershire might then become evident.

9.2 As can be seen from Section 6 of the Baseline Report a pressing problem with some quarries, sand and gravel pits in particular, is that they are nearing the exhaustion of their permitted reserves. Some quarries do have more reserves than others but generally the reserves held by even the most well off sites are quite low. This gives rise to the distinct possibility that unless additional reserves are permitted in the near future, and notwithstanding the currently quiet construction markets, some sites will be worked out shortly with a potentially adverse effect on the county’s longer term productive capacity and thence its ability to meet the annual outputs that have been identified for crushed rock and sand and gravel. This problem is compounded by the fact that for various reasons a particular site with diminishing reserves may not have immediately adjacent resources into which it could extend. To maintain capacity it is possible that new sites with new processing plant might be required. However, if output falls the effect will be to reduce the average production levels to be taken into account in future LAAs.

9.3 A possible approach to determining the effects of changes in productive capacity and reserves as active quarries close or inactive ones become operational is the ‘rundown’ approach as set out in a recent BGS study. This provides an indication of how supplies might be affected by the reserves and productive capacity situations at existing workings from which can be identified the point in time when additional reserves may be necessary to meet the chosen annualised productive capacity. This information is based on certain assumptions but for transparency and

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8 An evidence approach to predicting the future supply of aggregate resources in England. BGS 2011
credibility actual site information needs to be used wherever possible e.g. information on productive capacity and reserves. 'Rundown' charts can be calculated periodically for both production and reserves for the MPA area, for resource zones within the area or for different types of aggregate and these will show points at which critical positions are reached for each and whether productive capacity can be maintained.

9.4 Available information for Gloucestershire is inconsistent and, in particular, problems of confidentiality of data as well as the validity of the assumptions that would be made have limited the ability of the Council to adopt this approach and produce a specific rundown scenario. But based on currently available published information and the Council's understanding of the industry the supporting baseline report to this LAA include comments on the duration of workings and their productive capacity. The Council will seek to refine the data/amend the comments in consultation with industry during the progression of the MLP in order to define the rundown situation. The results of these further investigations as part of the MLP process will assist the Council in the formulation of policies, for the phased release of land for future working and to inform the determination of planning applications.

9.5 There are many supply scenarios that will dictate the longevity of quarries and virtually all of these will be determined by commercial conditions and events over which the MPA has no control. Where there are potential shortfalls in future provision identified in the LAA, the main mechanism to overcome these is for the MPA to identify allocations for future mineral working subject to technical and environmental acceptability. However, it will be for industry to come forward with the necessary planning applications. Productive capacity i.e. maximum annual output may be set by planning condition or may be limited by other factors such as existing or proposed plant capacity or an agreement on annual output with the mineral rights owner.

9.6 For the plan period mineral sites that are identified should aim to have the productive capacity and cumulative reserves and resource allocations to meet the total production and annual output that is required to provide a steady and adequate supply of aggregates. However, during the period to 2030, as well as total reserves being theoretically exhausted, individual quarries may cease production with the result that even if sufficient reserves are present at the remaining units they may not have any spare productive capacity to make up the shortfall in output in order to achieve whatever annualised forecast requirement has been identified. A crucial factor in considering deliverability is, however, the acceptability of any site for development when assessed against competing land use interests. This will form a fundamental part of the preparation of the MLP with regard to sites that may be considered for future allocation (if needed). Once the knowledge base is more clearly
developed and consultation is undertaken it will become more apparent as to how the future requirements for aggregates can be met.

9.7 The supply of aggregates in Gloucestershire is principally met by the winning and working of primary aggregates at crushed rock and sand and gravel quarries. It is considered that the alternative sources of aggregates from recycled C, D & E wastes; secondary aggregates from local building stone quarries and from further afield; marine aggregates from the Bristol Channel and primary aggregates from neighbouring MPA areas, although making a useful contribution to local market requirements, are unlikely to improve greatly on their current shares of the overall aggregates market.

9.8 It is intended to consult on site allocation options in late 2013/early 2014 and the results of this and other consultations with the general public and other interested parties as the MLP progresses, together with updated information through subsequent LAAs and on development control decisions will all be fed into the formulation of the resultant plan.
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