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**Torfaen Borough Council; Blaenau Gwent
Borough Council; Newport City Council;
Monmouthshire County Council**

**'Former Gwent'
Aggregates Safeguarding Study**

Final Report
May 2009

Cuesta Consulting Limited



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1. Introduction and Terms of Reference

1.1 This report presents the findings of a study commissioned jointly by the four Mineral Planning Authorities (MPAs) which comprise the former County of Gwent in South East Wales: Torfaen Borough Council, Blaenau Gwent Borough Council, Newport City Council and Monmouthshire County Council.

1.2 The aim of the study was to provide the geological input required by the MPAs in order for them to address the aggregate mineral safeguarding and apportionment requirements of the first edition of the South Wales Regional Technical Statement (RTS), published in 2008.

1.3 For Torfaen the RTS states: -

- o In order to meet a proportionate share of demand, the MPA should assess the potential to make a resource allocation in the LDP of 5 - 6 Mt; and
- o Limestone / sandstone resources should be investigated and safeguarded for possible future use.

1.4 For Blaenau Gwent the RTS states: -

- o In order to meet a proportionate share of demand, the MPA should assess the potential to make a resource allocation of at least 3 Mt in the LDP. Where feasible, this should be of limestone.
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- Additional resources of limestone should be investigated and safeguarded for possible future use in the LDP.
- Land based sand and gravel resources need to be safeguarded in the LDP.

1.7 The requirements shown in brackets were not included in the work covered by this study. It was also agreed at the outset that the study would provide only a desk-based geological assessment, using British Geological Survey (BGS) digital mapping; sand & gravel resource blocks previously identified by Symonds Group Ltd for the Welsh Assembly Government (WAG); discussions with industry; and limited field visits, with a view to identifying Mineral Safeguarding Areas (MSAs). As the study progressed it was confirmed that, whilst this report would also offer guidance on the delineation, within the MSAs, of Areas of Search and Preferred Areas (see Chapter 2 for definitions), the actual determination of these would be undertaken by the MPAs within their own Geographic Information Systems (GIS), by combining the geological MSA boundaries identified by Cuesta with urban areas, environmental constraints and other data held by the MPAs.

2. Methodology and Definitions

Definition of Mineral Safeguarding

- 2.1 Minerals Planning Policy for Wales (MPPW) notes, at paragraph 13, that *"It is important that access to mineral deposits which society may need is safeguarded"*; and that this means developing policies which *"protect them from other types of permanent development which would either sterilise them or hinder extraction"*.
- 2.2 The same paragraph makes clear that safeguarding *"does not necessarily indicate an acceptance of working, but that the location and quality of the mineral is known, and that the environmental constraints associated with extraction have been considered"*.
- 2.3 It is not clear from this statement to what extent environmental constraints need to be taken into account in defining the areas to be safeguarded. However, the South Wales RTS specifically requires the safeguarding of potential aggregate resources within National Parks (even though resource allocations in those areas are not required). For consistency with this, it is logical that Mineral Safeguarding Areas (MSAs) should also extend, where necessary, through other types of national (and international) environmental constraints, and beneath urban areas, so as to include the whole outcrop of geological formations that are considered likely to be suitable for use as aggregates.
- 2.4 This view is supported, with qualifications, by the BGS Guide to Mineral Safeguarding (McEvoy *et al.*, 2008), which notes that *"Mineral safeguarding should not be curtailed by other planning designations such as urban areas and environmental designations without sound justification"*. No further explanation is given as to what might constitute 'sound justification', although the guide points out that *"Any modifications made by an MPA such as decisions not to include a resource or reduce or extend a resource boundary, will need to be based on robust and credible evidence to withstand the scrutiny of a public examination"*.
- 2.5 In some circumstances it may be argued that designated areas might be excluded from MSAs if there are plentiful known resources in unconstrained areas nearby. This, however, may only stand up to detailed scrutiny if those alternative resources were known to be viable, based on detailed geological information. That is generally not the case in this particular study, where

rock". For the latter of these reasons, unless otherwise directed by the Welsh Assembly Government (WAG), it would seem appropriate that **MSAs for hard rock aggregate resources within the former Gwent area should exclude areas of existing urban development, as defined by the MPAs.**

- 2.7 The foregoing observations are made in good faith and based on national policy and available good practice guidance. They should not, however, be taken as formal recommendations. Final decisions on whether or not the MSAs should include or exclude environmental constraints and urban areas, and on the content of associated safeguarding policies within local plans, will be a matter for the individual MPAs (who may wish to seek further guidance from WAG).
- 2.8 The main remit of this study is to define the geological outcrops which represent potential resources, irrespective of other factors.

Identification of Geological Formations Suitable for Safeguarding

Hard Rock Formations

- 2.9 As noted above, in the absence of detailed, sub-surface geological information across the whole of the study area, the identification of potential hard rock aggregate resources has largely been based on the mapped distribution of 'solid' geological formations which either are, or are known to have been, exploited for use as aggregates elsewhere within the region. Other formations which are known to be of similar lithology (rock type) to those which have been or are being quarried, or which have been shown by aggregate quality testing to be potentially suitable, have also been considered for inclusion, through a process of elimination, described below. In all cases, the geological boundaries used have been those shown on the latest available BGS digital mapping for the area.
- 2.10 The 'former Gwent' area encompasses a very wide range of geological formations,

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Identification of Areas for Future Working

- 2.19 As well as safeguarding potential resources, MPPW and the RTS require Mineral Planning Authorities to consider allocations for future working. In this regard, para. 14 of MPPW states that *"Policies and proposals in development plans should make clear where mineral extraction should, or is most likely to, take place"* and that these areas *"should be clearly identified on a proposals map, and should take the form of:*
- o ***Specific Sites** where mineral resources of commercial significance exist, and where any planning applications which come forward for those sites are likely to be acceptable in planning terms;*
 - o ***Preferred Areas** which will be areas of known resources with some commercial potential, and where planning permission might reasonably be anticipated; or,*
 - o ***Areas of Search** where it is likely that some sites will be appropriate for mineral extraction, depending on economic and/or environmental circumstances. Areas of search will define broad areas that are believed to contain mineral resources of commercial significance but whose extent is uncertain. Within these areas, it is likely that appropriate mitigation measures can overcome all environmental effects. Within areas of search, planning permissions could be granted to meet a shortfall in supply should specific sites, preferred areas, or extensions to existing sites identified in the plan, not come forward."*
- 2.20 The same paragraph also makes reference to *"**Other Areas**"*, which may be considered *"where the mineral is needed to make good a proven shortfall in supply, and where the proposal is demonstrably proven to be environmentally acceptable and to have no adverse impact on the amenity of nearby residents or communities."*
- 2.21

some sites will be appropriate for mineral extraction, depending on economic and/or environmental circumstances". To meet this second requirement, Areas of Search should logically exclude those parts of the MSA where it cannot be said that mineral extraction is "likely to be appropriate". Such a statement could not be made, for example, in areas which are protected by certain National and International designations – particularly National Parks, Areas of Outstanding Natural Beauty (AONBs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites and the Blaenavon Industrial Landscape World Heritage Site. Whilst MPPW Policies 21 to 24 do not preclude mineral extraction in these areas, they make it clear that this would be possible only in "exceptional circumstances" (in the case of National Parks and AONBs) or where there are either "no alternatives" or "imperative reasons of overriding public interest" (in the case of SACs, SPAs and Ramsar Sites).

- 2.25 During the course of this study, the Mineral Products Association¹ has argued that *"the presumption against mineral extraction in National Parks, AONBs, SACs, SPAs and Ramsar Sites is not in my view so strong as to pre-empt the outcome of the exceptional circumstances that might apply to each proposal in or adjacent to such areas by excluding them from Areas of Search".* However, the fact that the industry perceives there to be a presumption against mineral extraction in these designated areas serves only to emphasise that they cannot be described as areas where mineral extraction is

- o **constraints** (e.g. areas where it is known that no suitable or workable mineral exists; and designations or issues which would affect whether or not *"planning permission might reasonably be expected"*).
- 2.30 In considering opportunities, much depends on the interpretation of the phrase *"known resources with some commercial potential"*. If this was taken to include all of the resources identified for safeguarding, the identification of Preferred Areas would be a relatively simple matter of subtracting from the MSA those areas affected by relevant constraints (see below). As already noted, however, geological characteristics (and thus, commercial potential) are known to vary from one part of an outcrop to another, and it cannot be assumed, without more detailed geological information, that all areas within the same formation are equally suitable for use as aggregates. In order to withstand the level of scrutiny required by the planning system, it would seem logical that Preferred Areas should only be identified in areas where more specific information is available regarding the quality and economic viability of the resource. At present, such information is only available for areas that have been investigated and tested by industry.
- 2.31 In considering potential constraints, allowance should be made for the fact that many potential impacts of mineral working (e.g. on groundwater, noise, dust, ecology and traffic) can be overcome or mitigated to an acceptable degree through the use of conditions and/or good design (including ideas put forward by operators in connection with proposed sites). For this reason, Preferred Areas should not necessarily exclude areas which are close to national or European designations, or those which are within, close to, or overlapping with any 'lesser' designations. They might, however, exclude the most visually intrusive locations (where the MPA considers that no amount of screening would be able to mitigate the impact), and areas where there is currently no feasible access to transportation routes (e.g. due to topographic constraints or being completely surrounded by urban development).

Specific Sites

- 2.32 Specific Sites represent the highest level of refinement at the Development Plan stage. MPPW defines these as sites *"where mineral resources of commercial significance exist, and where any planning applications which come forward for those sites are likely to be acceptable in planning terms"*. The inclusion of such sites within the Development Plan must therefore be based on the usual planning requirement for *"robust and credible evidence"* regarding all of these things (Planning and Compulsory Purchase Act 2004).
- 2.33 Since the introduction of the 2004 Act, those responsible for proposing Specific Sites have generally been expected by MPAs to demonstrate the quality and quantity of the mineral, the need for the mineral (in general terms, subject to more precise evidence at the application stage), and the feasibility (again, in general terms) of being able to address at least the most obvious planning concerns relating to the site in question. By virtue of doing this, it is conceivable that Specific Sites might sometimes be identified beyond the limits of Preferred Areas and perhaps even beyond the limits of Areas of Search (that is, within those parts of an MSA which fall within National or European environmental designations). The latter could only happen where the sites in question are considered likely to meet the criteria set out in MPPW (para's 21 to 24), but the possibility of this cannot be ruled out.
- 2.34 The level of investigation that is necessary to support the designation of Specific Sites is, in most cases, only likely to be carried out by a prospective developer. However, as the Mineral Products Association has pointed out (K. Hobden, *ibid.*), it should not be assumed that it is the sole responsibility of developers to do this: if an authority wanted to take full advantage of the opportunities provided by the plan led system, they may wish to assemble their own data.

3. Geological Formations Suitable for Safeguarding

3.1

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| (table continues ...) | | | |
|-------------------------------------|---|--------------------|--|
| Stratigraphic Unit | Lithology | BGS Code (LEX_RCS) | Observations |
| Quartzitic Sandstone | sandstone | QSG-SDST | Possible sources of sand & gravel (but probably too hard, requiring too much energy to break down). EXCLUDE |
| Quartz Conglomerate Sandstone | sandstone | QCG-SDST | |
| Quartz Conglomerate | sandstone and conglomerate, interbedded | QCG-SCON | |
| Quartz Conglomerate Formation | sandstone and conglomerate, interbedded | QC-SCON | |
| Quartz Conglomerate Fm Conglomerate | conglomerate and sandstone, interbedded | QC-COSD | |
| Tintern Sandstone | sandstone | TSG-SDST | Possible source of High PSV sandstone (Travers Morgan Report, 1993), but insufficient test data to justify inclusion. EXCLUDE |
| Senni Formation | sandstone and argillaceous rocks, interbedded | SB-SDAR | Possible source of High PSV sandstone (Travers Morgan Report, 1993), but problem of interbedded mudrocks. EXCLUDE |
| Brownstones Sandstone | sandstone | BRS-SDST | Possible source of crushed rock sand, but mostly rejected as such by the BGS study (Harrison <i>et al</i> 2000) on the basis of being unacceptably fine grained. Also probably contain too many impurities (iron and/or mica). EXCLUDE |
| Brownstones Micaceous Sandstone | micaceous sandstone | BRS-MCASST | |
| St Maughan's Sandstone | sandstone | SMG-SDST | |
| Raglan Sandstone | sandstone | RG-SDST | Possible sources of High PSV sandstone / siltstone, based on the fact that similar lithologies of this age elsewhere in Wales have been used as such, but no direct evidence on the properties of these specific formations. EXCLUDE |
| Downton Castle Sandstone | sandstone | DCS-SDST | |
| Ton Siltstone | siltstone | TSF-SLST | |
| Usk Limestone | limestone | ULF-LMST | Possible source of limestone, but no evidence of suitability and outcrops very limited in extent. EXCLUDE |

- 3.2 As noted in Chapter 2, the process of eliminating formations that are unlikely to be suitable for use as crushed rock aggregates leaves only two basic groups of rocks in need of safeguarding within the former Gwent area: The Carboniferous Limestones (for use as general purpose aggregates, including concrete manufacture), and the high PSV Carboniferous 'Pennant' Sandstones (for specific use as High Specification Aggregates in skid-resistant road surfacings).
- 3.3 Figure 3.1, below, shows the outcrop of these two groups of strata within the study area, based on the latest available BGS digital mapping. **It is recommended that, subject to decisions by the MPAs on whether or not urban areas should be excluded (see para. 2.6, above), the whole of these outcrops, together with an appropriate buffer zone around them, should be identified as Mineral Safeguarding Areas.** More detailed digital outlines of these areas have been provided directly to the four MPAs.
- 3.4 Figure 3.1 also shows the distribution of potential sand & gravel resource blocks identified within the former Gwent area in the earlier Symonds Group study (Thompson *et al.*, 2000). Unlike the solid geology outcrops discussed above, these areas already exclude existing built development and major roads. Again, **it is recommended that the whole of these areas, and appropriate buffer zones around them, should be identified as Mineral Safeguarding Areas.**

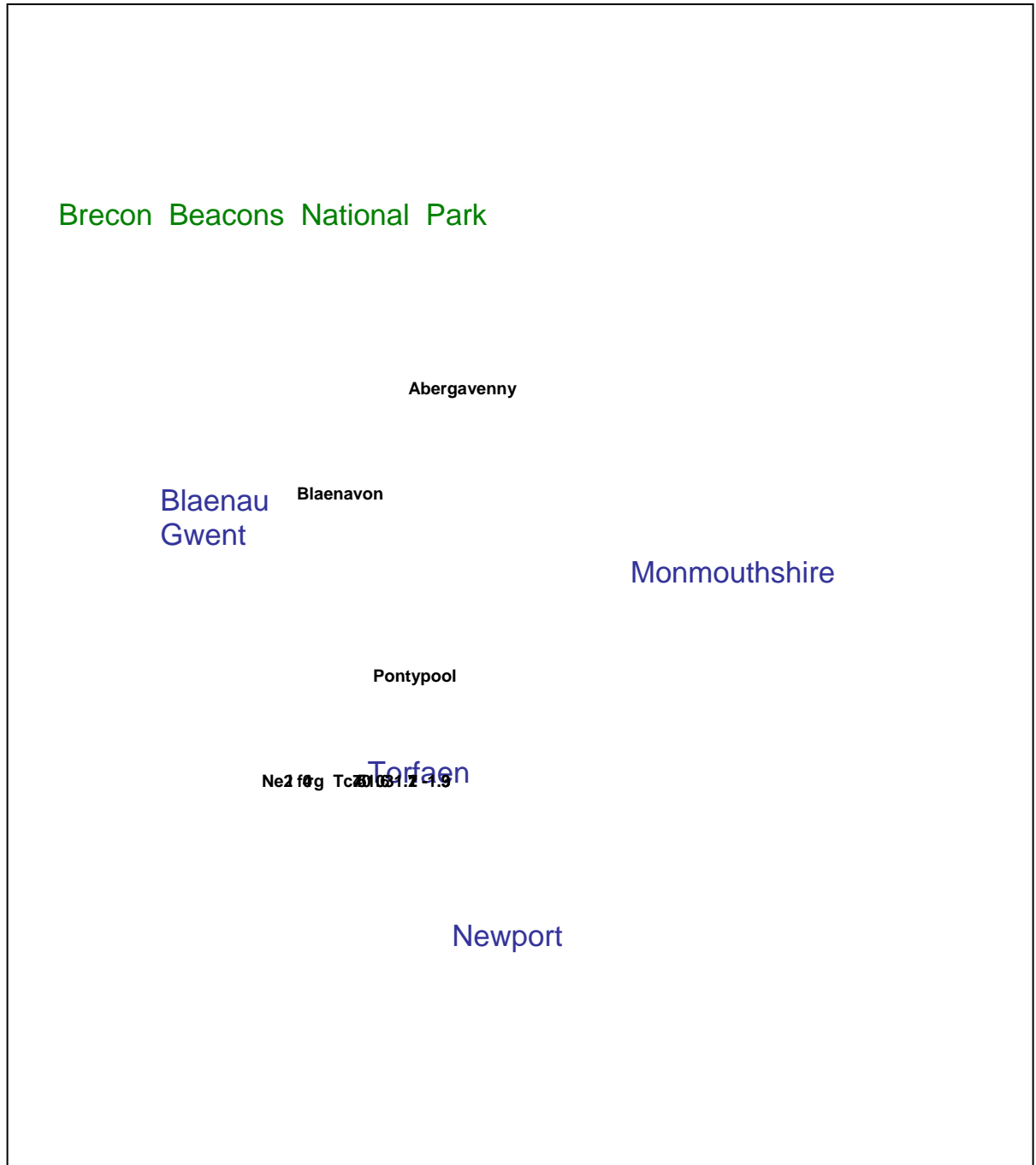


Figure 3.1: Distribution of Geological Outcrops that are recommended for Safeguarding within Blaenau Gwent, Torfaen, Newport and Monmouthshire

4. Allocations for Development Plans

- 4.1 As noted in Chapter 1, Torfaen, Blaenau Gwent and Newport are required by the RTS to 'assess the potential' for (or to assess the feasibility of) making specific allocations for future mineral working. Monmouthshire is not currently required to do so.

Torfaen

- 4.2 Torfaen is required to assess the potential to make a resource allocation in the LDP of 5 - 6 Mt. This study has demonstrated that plentiful resources of both Pennant Sandstone and Carboniferous Limestone exist within the borough, although the latter generally occur in relatively narrow outcrops along the eastern edge of the coalfield, and many of them are currently sterilised by existing development and infrastructure.
- 4.3 If consideration is given to the criteria suggested in paragraphs 2.19 *et seq.*, above, there should be scope for defining extensive Areas of Search within the Pennant Outcrop and, perhaps, within very localised parts of the limestone outcrop (e.g. to the north West of Abersychan). This will depend on the extent to which any of these areas are protected by European environmental designations or the Blaenavon World Heritage Site, details of which are held by the MPA.
- 4.4 It is more difficult to see how Preferred Areas or Specific Sites can be identified, at present, within any of these areas since, as explained in para. 2.30, above, this would require more detailed knowledge than is currently available regarding the quality of the resources and their commercial potential. The only proposal for mineral extraction in this area that has been put forward by industry to date relates to the reworking of a very large spoil heap from former opencast workings to the north of Tir Pentwys, west of Pontypool. This lies within the outcrop of the Pennant Sandstone, and within the proposed Safeguarding Area. Limited sampling and testing information presented by the applicant suggests that the spoil is capable of yielding both High Specification Aggregate and lower quality general fill material. However, the application has yet to be determined and there are outstanding planning (economic and environmental) issues to be resolved.

Blaenau Gwent

- 4.5 Blaenau Gwent is required by the RTS to assess the potential to make a resource allocation of at least 3 Mt (preferably of limestone) within the LDP.

the mountain between the A4046 and the A467 from Aberbeeg northwards. Borehole information is understood to indicate at least 90 metres of massively-bedded Hughes Formation sandstone with very limited clay partings, and the potential reserves in the Phase 1 indicative area are understood to be in the order of 60 Mt gross². Subject to MPA's views in implementing the advice set out in paragraphs 2.28 *et seq.*, above, and to the receipt of more detailed information from the prospective applicant regarding the commercial viability of the resources, it may be appropriate to identify some or all of this area as a Preferred Area, or even a Specific Site (depending on the level of information which the developer is willing to provide, and the MPA's views on the likelihood of planning permission being granted).

- 4.9 The second prospect is a westward extension of the Tir Pentwys spoil reclamation proposal in neighbouring Torfaen, as discussed in para. 4.4, above. Again, this lies within the outcrop of the Pennant Sandstone, and within the proposed Safeguarding Area. No sampling or testing information for the western part of this area has been seen, but it is likely that it will contain both High Specification Aggregate (HSA) and lower quality general fill material. As with Tir Pentwys, the commercial viability of working this site will depend to a large extent on the proportion of HSA which is able to be produced.

Newport

- 4.10 Newport City Council is required by the RTS to examine the feasibility of making allocations of 8 to 8.5 Mt within its LDP. Options for doing so would appear to be very limited. Subject to the implementation of the suggested criteria, Areas of Search may be able to be identified within the Carboniferous Limestone outcrops in the far east of the MPA's area and, to a far more limited extent, in the far west, to the north east of Lower Machen village. Areas of Search may also be identified within the localised sand & gravel deposits in the Rhymney valley, directly south of Lower Machen.
- 4.11 In the absence of any known industry proposals and the lack of other detailed resource information, the only prospect for identifying Preferred Areas or Specific Sites within Newport at the present time would be in the land immediately adjacent to Penhow Quarry, which ceased working several years ago. Based on discussions with the site owners, Hanson Aggregates, the only realistic prospects for extending that quarry would be to the east, where the workings would be increasingly exposed to view from the village of Llanvaches. Deepening the quarry would not, in Hanson's view, be a viable option because of the deteriorating quality of the rock within and below the lower bench. Whilst alternative prospects might be discovered in other parts of the Carboniferous Limestone outcrops nearby, no resource information for these areas is available and it is therefore not feasible to identify either Preferred Areas or Specific Sites. Hanson has pointed out, however, that substantial permitted limestone reserves, and significant additional resources exist nearby at Ifton Quarry in Monmouthshire, less than 5km from the Newport border (see para. 4.14, below). Although Ifton Quarry is currently inactive, it has a valid permission with modern conditions and could quickly be reactivated if there was sufficient demand.
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because Machen is able to supply to the whole of that area (including all of Newport City Council).

- 4.13 In view of the difficulty faced by Newport in meeting the RTS requirement for new allocations, the possibility of relying on the resources available within neighbouring parts of Monmouthshire and/or Caerphilly may need to be considered. This would be in line with the RTS, which notes (in para. 6 of the Foreword) that: "*Some authorities may, however, need to agree the level of apportionment between themselves as some may find it difficult to meet their specific apportionment requirements due to environmental constraints*". Given the close proximity of both Ifton and Machen to the Newport border, this would also still be in line with the Proximity Principle.

Monmouthshire

- 4.14 Monmouthshire is not explicitly required by the RTS to make a resource allocation within its LDP. It may have scope to do so, however, should this become necessary. In particular, as noted above, workable resources of Carboniferous Limestone are known to exist adjacent to Ifton Quarry. Hanson Aggregates has advised that land within its control, immediately to the west and north west of the quarry, contains an estimated 30 Million tonnes of proven reserves (in addition to the 11Mt of existing permitted reserves at this site).

5. Secondary and Imported Aggregates in Newport

- 5.1 For Newport City Council, the South Wales RTS notes that *"The secondary aggregate stockpiles should be monitored and where available used to replace the shortfall in primary aggregate reserves"*. It also requires that *"The feasibility of sea borne rock imports should be explored"*.

Secondary aggregate stockpiles

- 5.2 Whilst the monitoring of secondary aggregate stockpiles is an ongoing requirement and therefore beyond the remit of this study, it was agreed that the study should cover an assessment of the feasibility of secondary aggregates in Newport being used to replace some or all of the shortfall in primary reserves.
- 5.3 Two secondary aggregate stockpiles are known to exist within Newport, these being the stockpiles of steel slag at the Llanwern steel works site, and the stockpile of spent railway ballast at Monmouthshire Bank (Mon Bank) sidings.

Llanwern

- 5.4 The Llanwern site formerly produced aggregates from blast furnace slag on an ongoing basis, but this ceased when the blast furnace closed in July 2001. The same site does, however, continue to produce Basic Oxygen Steel (BOS) slag from the stockpiles of

Monmouthshire Bank

- 5.10 The Monmouthshire Bank sidings in Newport were, until recently, an area where spent rail ballast was stockpiled and reprocessed into secondary aggregate. According to the South Wales RTS the annual production here was in the order of 150,000 tonnes.
- 5.11 As with Llanwern, the site was operated by Tarmac, but is owned by Network Rail. In March 2009, aggregate production at this site ceased and Network Rail redistributed the remaining stocks to other sites, outside Newport City Council's area.
- 5.12 This site therefore no longer represents a source of future supply.

Imports of sea-borne crush2 Tbocekaggregate

6. Conclusions

- 6.1 This study has examined the requirements, set out in the South Wales Regional Technical Statement, for the safeguarding of primary aggregate resources and the identification of potential allocations for future working, within the four Mineral Planning Authorities making up the former County of Gwent (Torfaen, Blaenau Gwent, Newport and Monmouth).
- 6.2 Through a process of elimination based on known information about aggregate properties and bedding characteristics, the study has identified the outcrops of Carboniferous Pennant Sandstone and Carboniferous Limestone as prospective Mineral Safeguarding Areas (MSAs).
- 6.3 Detailed digital outlines of these areas, and of the potential sand & gravel resource

REFERENCES

Harrison, D.J., Wilson, D, Henney, P.J. and Hudson, J.M. (2000): **Crushed Rock Sand in South Wales: A Reconnaissance Survey**. British Geological Survey Technical Report WF/00/3. Keyworth, Nottingham. (28pp + Appendices) :: Bee, Eushed Rannis, Sn R1 Tc -0.075d-e