

PROPOSED TOOLKIT FOR DEVELOPING AGGREGATE APPORTIONMENT OPTIONS (ASRP 2/8)

Final Report

**Prepared for the Minerals Industry Research Organisation
by
Land Use Consultants,
in association with Green Balance and
the British Geological Survey**

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Executive Summary

INTRODUCTION

1. The regional and sub-regional apportionment of aggregate provision is a long-established component of mineral planning in England. Driven by a need to ensure a steady and adequate supply of raw materials to the construction industry, it has been a priority of Government to maintain a planning system that ensures sufficient land comes forward for extraction in locations in reasonable proximity to the principal markets.
2. The regional apportionment process is driven partly by the available distribution of resources but is also strongly influenced by the maintenance of productive capacity in traditional supply areas, reflecting the investment in extraction and transportation infrastructure, and established planning policy to protect areas of acknowledged environmental value. This has led to questions about the extent to which attention has been paid to the environment in the 'current approach' to apportionment of the National Guidelines to the Regions in England.
3. By contrast, at the sub-regional apportionment level, many of the former planning Regions have sought to implement methodologies for the apportionment of aggregate provision between Minerals Planning Authorities which take account of environmental considerations in a transparent way. However, such work has been varied in process and outcome.

PROJECT AIM

4. The original project brief described the overall aim of the project as the development of: "*a methodology to assess the environmental implications of aggregates apportionments*". At the outset of the work, the exact meaning of this aim was clarified with the project steering group, such that the project should consider how environmental considerations can be taken into account during the apportionment process. Assessment of environmental implications is in fact already addressed through the legal requirements of Strategic Environmental Assessment and Habitats Regulations Assessment.
5. The following work has been undertaken:
 1. An evaluation of current approaches to regional and sub-regional aggregates apportionment. This centred on a review of the various approaches that have been tried against a set of agreed criteria to identify good practice and, where appropriate, shortcomings in the methodologies used.
 2. Drawing on the findings of the evaluation, reviewing the extent to which improvements are needed in the aggregate apportionment process and steps that can be taken to achieve a consistent mechanism for developing apportionment options.
 3. The formulation of a toolkit for developing apportionment options that ensures environmental considerations are taken into account during, and therefore informing, the apportionment process, and that

the process is founded on a robust evidence base, engages relevant stakeholders and is well documented and transparent.

OVERVIEW OF CURRENT APPORTIONMENT METHODOLOGIES

6. A summary of the regional apportionment process in England and the sub-regional processes followed in the nine English regions is provided. The approaches in Wales and Scotland have also been considered. It is evident that practice varies across the regions, and some Regional Aggregates Working Parties (RAWPs) and Regional Assemblies have experimented with new methodologies which seek to pay more attention to environmental considerations compared to what is characterised as a 'past sales' approach (i.e. based on data relating to past patterns of aggregate supply). In making this observation, it is important to acknowledge that past patterns of supply in part reflect planning and environmental constraints applied at lower tiers of the planning system (i.e. through development plans and the development management process) and thus already have an 'in-built' environmental policy component.

EVALUATION OF SUB-REGIONAL APPORTIONMENT METHODOLOGIES

7. The methodologies for aggregates apportionment attempted in each of the nine English regions and the two Welsh regions were evaluated using a framework based on qualitative descriptions of the potential strengths and weaknesses. Each apportionment method was evaluated against six criteria:
 1. Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)
 2. Degree to which reasonable alternative spatial options are considered
 3. Transparency of approach
 4. Data and technical requirements (including level of definition of geological data required)
 5. Level of spatial definition of outputs
 6. Extent of stakeholder engagement
8. Environmental issues were most comprehensively incorporated into apportionment methodologies attempted in South East, West Midlands and North/South Wales, with only partial consideration in the East of England, North East and North West Regions. However, it is recognised that environmental issues may have been more fully considered in these regions through RAWP meetings etc, but documentation of the process is not readily available.
9. A similar picture exists in relation to the consideration of different spatial options, with those regions above that incorporated environmental issues more comprehensively as well as Yorkshire and Humber Region, also considering a full set of reasonable alternatives.

10. Eight of the ten regions were explicit about judgements made within the methodologies attempted, and drew on the best available evidence. Methodologies used for London and the North East Region are less transparent. Again, it is acknowledged that appropriate documentation of the process may not have been obtained, as it may only be available within minutes of meetings etc.
11. None of the methodologies is considered to be technically complex, but most require some technical expertise and have some data limitations. These tend to be those regions that have incorporated a full range of environmental considerations and alternative options.
12. The level of spatial definition of outputs is based on MPA boundaries for the majority of regions, but based on geological 'resource blocks' for the South West and North/South Wales.
13. Key stakeholders have been involved in the apportionment process for most regions, with a full range of interests involved in the South East, South West, West Midlands and Yorkshire and Humber Regions. Some stakeholders were involved in the creation of the North/South Wales environmental capacity tool, but there was very limited engagement in the application of the tool.

RECOMMENDATIONS

14. It is evident from the various approaches attempted to apportion aggregates in different parts of the country that they reflect particular local circumstances – geology, past patterns of supply, the composition of aggregate working parties, etc. Thus rather than formulating a prescribed one size fits all methodology, a toolkit for developing apportionment options between constituent MPAs or other spatial planning unit is recommended. This comprises three key components: local demand, local supply and environmental issues.
15. It is recommended that:
 - An accurate assessment of local demand for aggregates within the aggregate working party area is required, as understanding future demand helps establish how much primary aggregate will be needed to supply the construction industry and where building materials are likely to be required in large quantities. This can be used to influence the distance over which aggregates may be transported from areas of supply, thereby helping to reduce emissions from transport.
 - An accurate assessment of the quality and spatial extent of primary aggregates available for extraction is required to ensure any apportionment options are realistic. This is likely to require the BGS Mineral Resource Data to be supplemented with local knowledge, drawn from pooling information available from MPAs and industry on the extent, quality and workability of aggregate resources.
 - The consideration of environmental issues should be a central part of an apportionment methodology, and the resulting apportionment options. The range of environmental considerations that could be included is wide, and it will be for aggregate working parties to

determine which ones are most relevant to their particular local circumstances. In doing so, it will be important to draw a distinction between those which lend themselves to a strategic-level apportionment (e.g. the presence of nationally designated landscapes), and those which are better dealt with at the minerals development framework level by individual MPAs (e.g. impacts on local environmental designations).

16. Any methodology should also display five essential characteristics:
 - Transparency of approach (i.e. it should be possible for all stakeholders to see and understand the data inputs, assumptions made and outputs).
 - Data and technical inputs to be as robust as possible without requiring excessive cost of new data provision.
 - Level of spatial definition (i.e. it should be possible for all stakeholders to identify the planning unit to which a local apportionment applies).
 - Extent of stakeholder involvement (i.e. there should be adequate stakeholder input to the apportionment process).
 - Consideration of alternatives (i.e. realistic and achievable alternatives at each stage of the apportionment methodology should be considered).
17. The output from the apportionment methodology should be a set of apportionment options divided between the relevant planning unit(s), which can form the basis of public consultation, leading to the choice of a preferred strategy for inclusion in the relevant development plan(s).
18. Lastly, the report provides some comments on the process used for determining the national and regional aggregates guidelines and highlights aspects which may be considered for improvement, based on the evaluation of existing approaches. Suggestions for improvement include greater transparency in the approach taken in establishing the guidelines, particularly with regard to access to the source data; consideration of alternatives; spatial definition of outputs (e.g. geological resource blocks rather than administrative areas); and enhanced stakeholder input.

1 Introduction

BACKGROUND

- I.1 The regional and sub-regional apportionment of aggregates is a long-established component of mineral planning in England. Driven by a need to ensure a steady and adequate supply of raw materials to the construction industry, it has been a priority of Government to maintain a planning system that ensures sufficient land comes forward for extraction in locations in reasonable proximity to the principal markets. Regular publication of National and Regional Guidelines for Aggregates Provision (most recently published by the Department for Communities and Local Government in July 2009) has served to quantify the amount of material required on a national and regional basis. The regional apportionment has then been divided into sub-regional amounts, usually based on individual or groups of Mineral Planning Authorities (MPAs).
- I.2 The regional apportionment process is driven partly by the available distribution of resources but is also strongly influenced by the maintenance of productive capacity in traditional supply areas, reflecting the investment in extraction and transportation infrastructure, and established planning policy to protect areas of acknowledged environmental value (e.g. nationally important landscapes and habitats). In other words, apportionment to regions reflects past practice in aggregate production. The latest Guidelines for Aggregates Provision were drawn up on the basis that inter-regional flows remained at 2005 levels, and then that each region should be required to supply each mineral type in proportion to its 2005 sales, sufficient to satisfy demand. This has led to questions about the extent to which attention has been paid to the environment in the 'current approach' to apportionment of the National Guidelines to the Regions in England.
- I.3 By contrast, at the sub-regional apportionment level many of the Regions have sought to implement methodologies for the apportionment of aggregates which take account of environmental considerations in a transparent way. However, such work has been varied in process and outcome.

PROJECT AIM

- I.4 The original project brief described the overall aim of the project as the development of: "*a methodology to assess the environmental implications of aggregates apportionments*". However, the aim was discussed further with the project steering group¹ at the inception meeting because when considering the brief as a whole it could be interpreted in two different ways:
 - a). that the project should consider how to assess the environmental implications of an apportionment or apportionments; or,

¹ Comprising representatives of MIRO, Defra and DCLG

- b). that the project should consider how environmental considerations can be taken into account during the development of an apportionment or apportionments.
- 1.5 The client agreed that the intention of the project was to develop an aggregates apportionment methodology that takes environmental considerations into account as part of the apportionment process, drawing on current and novel approaches where appropriate i.e. 'b' above. Assessment of environmental implications (i.e. 'a' above) is in fact already addressed through the legal requirements of Strategic Environmental Assessment and Habitats Regulations Assessment.
- 1.6 As the project progressed and the authors took on board comments from consultees, the title of the report evolved to become: Proposed Toolkit for Developing Aggregate Apportionment Options. This is because it is evident from the work undertaken for this study that any attempt to prescribe a fixed methodology to be used whatever the local circumstances would not be helpful. The reasoning behind this conclusion is explained in more detail in **Section 6**.

PROJECT OBJECTIVES

- 1.7 The overarching aim of the project has been met by completing the following:
1. A rapid evaluation of current approaches to regional and sub-regional aggregates apportionment. This centred on a review of the various approaches that have been used or trialled to identify good practice and, where appropriate, shortcomings in the methodologies.
 2. Drawing on the findings of the evaluation, the second project objective was the development of a methodology that ensures environmental considerations are taken into account during, and therefore informing, the apportionment process. As explained above, this is distinct from a method to assess the environmental implications of an apportionment.
 3. Reviewing the extent to which improvements are needed in the aggregate apportionment process and steps that can be taken to achieve a consistent mechanism.

STRUCTURE OF THE REPORT

- 1.8 Sections 2 to 5 document the first stage of the project – evaluation of current approaches to aggregates apportionment – and identify the strengths and weaknesses of these.
- 1.9 Sections 6 to 10 describe the proposed apportionment methodology and the process of its formation. Conclusions and project recommendations are contained in Section 11.
- 1.10 To aid the reader the content of each section of this report is as follows:
- Section 2** contains details of the approach used for evaluating existing apportionment methodologies.
- Section 3** provides an overview of the approaches to aggregates apportionment covered by the evaluation.

Section 4 discusses and evaluates the approach used to define the National and Regional Guidelines for Aggregates Provision.

Section 5 evaluates the sub-regional apportionment methodologies and provides an overall summary of strengths and weaknesses of apportionment methodologies reviewed.

Section 6 introduces the core components and characteristics of the proposed apportionment methodology, which are then described further in sections 7 to 10;

Section 7: describes the reason for including demand as a core component of the proposed apportionment method and the data that may be used to estimate the quantity and location of future aggregate demand;

Section 8: describes the reason for including supply as a core component of the proposed apportionment method and the data that may be used to estimate the quantity and location of future aggregate supply;

Section 9: describes the recommended environmental issues that should be covered in a strategic-level apportionment exercise and the data that may be used to characterise these environmental issues;

Section 10: provides guidance on how to develop alternative apportionment options based on the three core components described in Sections 7 to 9;

Section 11: summarises the conclusions and recommendations of the study.

PROJECT ASSUMPTIONS

Managed Aggregates Supply System

- 1.11 Since the recommendations of the Verney Committee were published in 1976, of which the majority were implemented, England has used the Managed Aggregates Supply System (or MASS) as a systematic process for assessing resources and forecasting demand at the national and regional level to ensure that the demand for aggregates throughout the country is met. The sub-regional apportionment of the regional figure derived through MASS has been undertaken by the Regional Aggregate Working Parties (RAWPs) who include, but are not limited to, representatives of the Mineral Planning Authorities (MPAs), industry and the relevant Government Office for the Region.
- 1.12 In recent years, the outcome of the apportionment processes undertaken by the RAWPs has been transferred into planning policy through the Regional Spatial Strategies, produced by the Regional Assemblies and published by the respective Regional Government Offices. However, in a letter to planning authorities in July 2010, the Secretary of State for Communities and Local Government, Eric Pickles, and Chief Planner, Steve Quartermain, stated that the Government intends to abolish Regional Spatial Strategies along with the Regional Assemblies, in accordance with the Government's decentralisation agenda. This has left a level of uncertainty surrounding MASS.
- 1.13 Despite the current uncertainty, it has been assumed for the purpose of this project that MASS will continue in one form or another to guide the level of inter-regional supply of aggregates in order to overcome the imbalances of

geological distribution between regions. This issue is discussed further in **Section 3**.

- I.14 It is recognised that data relating to past levels of aggregate provision have shown that the national forecasts of aggregate demand and regional guideline figures have not necessarily been met to date², but this study focuses on the method of apportioning any guideline figure, thus it can be applied to any future guideline figure that may be developed.

Marine Aggregates

- I.15 The Marine and Coastal Access Act 2009 introduced a new system of marine planning. The Department for Environment, Food and Rural Affairs (Defra) has recently consulted on a draft Marine Policy Statement (MPS), which contains the framework for the production of Marine Plans and taking decisions that affect the marine environment. Marine Plans will set out how the MPS will be implemented in specific areas. They will provide detailed policy and spatial guidance for an area and help ensure that decisions within a plan area contribute to delivery of UK, national and any area specific policy objectives.³
- I.16 As set out in the draft MPS, marine sand and gravel makes an important contribution to meeting the UK's demand for construction aggregate materials and therefore are essential for the development of our built environment. They are particularly important in England, accounting for 38% of the total regional demand for sand and gravel in the South East (80% in London), 46% in the North East and 22% in the North West.
- I.17 The draft MPS states that marine plan authorities should as a minimum make provision within Marine Plans for a level of supply of marine sand and gravel that ensures that marine aggregates (along with other sources of aggregates) contribute to the overarching Government objective of securing an adequate and continuing supply to the UK for various uses. In doing so, marine plan authorities should consider the potential long-term requirement for marine-won sand and gravel, taking into account trends in construction activity, likely climate change adaptation strategies and major project development.
- I.18 It is acknowledged that the contribution of marine sand and gravel resources to ensuring the supply of aggregate is crucial, as demonstrated by the Government's commitment to its continued supply in the draft MPS. However, this project was commissioned to focus on the apportionment of land-won primary aggregate, regardless of the proportion of overall aggregate supply that is met from this source. As such, the varying proportion of aggregate supply met from marine sources is not the focus of this study.

Terminology

- I.19 The proposed removal of the regional tier of the planning system has resulted in some hesitation in using the terms 'regional' and 'sub-regional'. As such,

² See for example: *Review of the Basis for the National and Regional Guideline for Aggregates Provision 2005 -2020 as Applied to South East England*. Prepared for the South East of England Regional Assembly by Green Balance, January 2009.

³ HM Government (July 2010) UK Marine Policy Statement: A draft for consultation

we have adopted the term ‘strategic’ to indicate an apportionment methodology that could be used by a grouping of MPAs. However, where the existing apportionment methodologies undertaken at the regional and sub-regional level are discussed, we have continued refer to them as such to avoid confusion.

Sustainability Appraisal and Strategic Environmental Assessment

- I.20 In a number of the regions, the apportionment options or scenarios developed have been subject to sustainability appraisal (incorporating strategic environmental assessment). As agreed with the client, it is not the intention of this project to review the sustainability appraisals that have been undertaken. However, it is acknowledged that the findings of sustainability appraisals may have fed into the apportionment methodologies, providing a mechanism for environmental issues to be taken into account.

Judgements and recommendations

- I.21 The descriptions and judgements provided for each apportionment method evaluated during this study represent the Consultants’ understanding and evaluation of the processes undertaken, which have been formed through discussions with RAWP members and publicly available information such as reports and meeting minutes. All views about the strengths and weaknesses of different approaches are the Consultants’ own, based on the evaluation criteria developed during this study to meet the study aims (see Section 5). It is recognised that others may have different opinions about what constitutes a strength or weakness in approaches to apportionment of aggregate guideline figures.

2 Approach to the Review of Current Apportionment Methodologies

INTRODUCTION

- 2.1 This section sets out the approach used to review each of the aggregate apportionment methodologies considered in the study.

APPORTIONMENT METHODOLOGIES REVIEWED

- 2.2 Following the Verney Committee Report, MASS was implemented in England and Wales, but not Scotland or Northern Ireland. As such, this project has focussed on the experiences of aggregates apportionment in England and Wales only. A brief summary of the approach used in Scotland is provided in **Section 3**, with a view to drawing on strengths that could be incorporated into a revised methodology for England.
- 2.3 The review of the national approach to aggregates apportionment i.e. that used to produce the National and Regional Guidelines for Aggregates Provision (July 2009) is separate to those of the sub-regional apportionments, recognising the difference in the approaches taken. A discussion and evaluation of the National and Regional Guidelines for Aggregates Provision is provided in **Section 4**.

APPROACH TO REVIEWS

- 2.4 The methodologies for aggregates apportionment attempted in each of the nine English regions and the two Welsh regions are considerably varied. In order to draw out strengths and weaknesses of each apportionment methodology (in relation to the overall project aim) and ensure consistency in carrying out the reviews, the following approach was developed.
- 2.5 The reviews intentionally avoided scoring or rating, on the understanding that such systems could hide important details about the apportionment methodologies. Instead, qualitative descriptions of the potential strengths and weaknesses of the apportionment methodologies were preferred. Each apportionment method was evaluated against a set of six criteria. These criteria were developed and agreed with the project steering group to represent important elements of an apportionment process, and reflect the overall project aim of considering how environmental considerations can be taken into account during the development of a new apportionment method:
- A Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)
 - B Degree to which reasonable alternative spatial options are considered
 - C Transparency of approach
 - D Data and technical requirements (including level of definition of geological data required)
 - E Level of spatial definition of outputs
 - F Extent of stakeholder engagement

- 2.6 In addition, categories representing strengths and weaknesses for each criterion were developed as a guide to the reviewer (**Table 2.1**).
- 2.7 The approach to the review, including the criteria and associated categories of strengths and weaknesses, was discussed with representatives of industry and Mineral Planning Authorities in two separate workshop sessions held in October 2010. **Appendix I** contains details of the attendees.
- 2.8 Feedback from the discussions resulted in the following changes to the review criteria:
- To change Criterion C to ‘Transparency of approach’ from the original criterion entitled ‘System used for generation/creation of options’. It was felt that this would give more meaning to the review as transparency is a key issue.
 - To merge original Criterion 4 ‘Data requirements’ and 5 ‘Ease of use’ into Criterion D ‘Data and technical requirements’ as there was a degree of duplication between the two.
 - To delete original Criterion 8 ‘Soundness’ as only one apportionment had been subject to Examination in Public.
- 2.9 Note that the Criterion F: Extent of stakeholder engagement should not be confused with public consultation on the apportionment or options resulting from the apportionment process. The intention of this criterion is to identify where the statutory and, where appropriate, non-statutory environmental bodies, and industry representatives have been involved in the apportionment process.

Table 2.1: Review criteria and associated categories updated following stakeholder workshops

<div style="display: flex; justify-content: space-between; align-items: center;"> Strength ←————→ Weakness </div>		
A Range of environmental issues incorporated NB: This criterion relates to incorporating environmental issues into the methodology, rather than assessing through SA/SEA		
All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered.	Some gaps in environmental issues incorporated or partial consideration and no clear justification for this.	Several gaps or very partial consideration of environmental issues and no clear justification for this.
B Degree to which reasonable alternative spatial options are considered		
Method considers a full set of reasonable alternative apportionment options.	Some reasonable alternative apportionment options not considered.	Method based on one apportionment option.
C Transparency of approach		
Method followed and judgements made are explicit and based on best available evidence.	Method followed and judgements made are not always clear or fully justified.	Method followed and judgements made are largely subjective and not clearly linked to evidence.
D Data and technical requirements (including level of definition of geological data required)		
Method requires limited technical expertise and data is readily available.	Method requires some technical expertise and has some current data limitations.	Method is technically complex and data unlikely to be readily available.
E Level of spatial definition of outputs NB The judgements made regarding the categories under this criterion were based on the understanding that the sub-regional apportionment should not be undertaken at the site specific level as this is the remit of each individual MPA.		
Based on MPA boundaries or groups of MPAs.	Based on 'resource blocks' – distribution of different types of mineral resources.	Includes site-specific analysis.
F Extent of stakeholder engagement		
Involves full range of stakeholder interests in developing apportionment options.	Some key stakeholders not involved and/or limited stakeholder involvement in the process.	Small steering/sub-group with very limited range of stakeholders and stakeholder involvement.

Assessing the range of environmental issues considered

- 2.10 The range of environmental issues considered under 'Criterion A' is set out in **Table 2.2**, using the SEA Directive⁴ topics. Those considered most appropriate for consideration of aggregates apportionment at the sub-regional level are highlighted in **bold**. It should be noted that consideration of transport, an important environmental issue with regards to aggregates extraction, is considered under both air and climatic factors.

Table 2.2: Range of environmental issues considered within review

The SEA Directive Topic Areas	Issues to consider in relation to aggregates extraction (those in bold most relevant at sub-regional level)
Biodiversity, flora and fauna	<ul style="list-style-type: none"> • Effect on International and National nature conservation designations – Ramsar Sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and National Nature Reserves • Safeguarding around aerodromes to avoid bird strike • Effect on priority BAP habitats and species and local level designations e.g. Local Nature Reserves
Population	<ul style="list-style-type: none"> • Effects of minerals extraction and transport on community wellbeing e.g. open space, employment, services
Human health	<ul style="list-style-type: none"> • Effects of minerals extraction and transport on human health
Soil	<ul style="list-style-type: none"> • Effect on best and most versatile agricultural land
Water	<ul style="list-style-type: none"> • Effect on flood risk • Effect on water quality • Effect on water resources
Air	<ul style="list-style-type: none"> • Air pollution – emissions from minerals extraction and transport
Climatic factors	<ul style="list-style-type: none"> • Greenhouse Gas emissions from minerals extraction and transport (not extending to lifecycle analysis)
Material assets	<ul style="list-style-type: none"> • Effect on built environment other than cultural heritage assets
Cultural heritage	<ul style="list-style-type: none"> • Effect on Heritage Assets – Listed Buildings, World Heritage Sites, Registered Parks and Gardens, Scheduled Ancient Monuments and Historic Battlefields.
Landscape	<ul style="list-style-type: none"> • Effect on National Landscape Designations – Areas of Outstanding Natural Beauty, National Parks and Heritage Coasts • Effect on Green Belt • Effect on local landscape designations

⁴ European Directive 2001/42/EC on the assessment of effects of certain plans and programmes on the environment.

Reasonable alternative spatial options

- 2.11 According to Planning Policy Statement 12: Local Spatial Planning⁵, in order to be justifiable, Development Plan Documents (including Mineral Development Plans) must be founded on a robust and credible evidence base and be the most appropriate strategy when considered against the reasonable alternatives. As the aggregate apportionment for an area comprises part of the evidence base for the development plan, reasonable alternatives should be examined.
- 2.12 Acknowledging the above paragraph, the review of apportionment methodologies against 'Criterion B' takes into account that alternative options should not be developed for the sake of it. Only reasonable alternative options need be developed i.e. those that are considered to be realistic and achievable. The review acknowledges that in certain circumstances it may be that no reasonable alternatives exist e.g. where aggregate resources are extremely limited, in which case more than one apportionment option is not realistic. However, in the interests of transparency, the reasons for the generation or lack of options should be clearly recorded.

Review Results

- 2.13 Using the final criteria and categories in Tables 2.1 and 2.2, a review of the regional apportionment method and each sub-regional apportionment methodology (in England and Wales) was undertaken, the results of which are included in **Appendices 2 and 3**. During the reviews, additional information was also recorded to provide an explanation and justification of the conclusions reached. These reviews were then used to identify strengths and weaknesses associated with each method, which are described in **Section 5**.

⁵ Department for Communities and Local Government (2008) Planning Policy Statement 12: Local Spatial Planning

3 Overview of Current Apportionment Methodologies

INTRODUCTION

- 3.1 This section provides an introduction to the aggregate apportionment methodologies considered in this project and reviewed in **Sections 4 and 5**. The apportionment methods covered are split into the approach used to apportion the national guideline figures to the regional level in England and Wales, and the sub-regional apportionment methods attempted by the English Regions and in Wales. In addition, other background reports of relevance to the study have been identified.
- 3.2 The overviews provided for each apportionment method represent the Consultants' understanding of the processes undertaken, which have been formed through discussions with RAWP members and publicly available information such as reports and meeting minutes.

REGIONAL APPORTIONMENT METHODOLOGIES

England

- 3.3 For the last 30 years a procedure known as the Managed Aggregates Supply System (MASS) has been in place, embedded within the planning system, to resolve the difficulty of many of the major markets for aggregates being located in different parts of the country from the principal supplies of aggregates. It aims to ensure, broadly, that the main supplying areas provide more aggregate than they require to meet their own demands alone, that areas of greater aggregates consumption provide for their own demands as best they can before calling upon imports from elsewhere, and that clear expectations of inter-regional movement of aggregates create a stable climate for investment in such movements by the aggregates industry. The Government also uses the system to prioritise the use of alternative aggregates before primary aggregates and to encourage the use of marine-dredged aggregates to the extent that environmentally acceptable sources can be identified and exploited.
- 3.4 The process of MASS is underpinned by an evidence base, notably the results of monitoring to establish current patterns of supply, distribution and demand, plus technical inputs such as demand forecasts. The Government takes responsibility for preparing and issuing every few years *National and Regional Guidelines for Aggregates Provision in England*, recently for periods of 16 years ahead. This identifies the overall national demand for aggregates in the years ahead which the planning system is expected to provide for, and allocates quantities of supply to be provided by each of the nine English regions, distinguishing broad mineral types.
- 3.5 Important inputs to this government advice on regional guidelines are made by the Regional Aggregate Working Parties (RAWPs) in each region, which bring together interested parties from the mineral planning authorities, industry and other groups (including environmental bodies) to help establish

the basis for future aggregates supply, ideally by agreement. Nationally the work of the RAWPs is brought together through a National Co-ordinating Group, supplemented by a Technical Sub-Group. While the *National and Regional Guidelines for Aggregates* are produced through a 'top-down' process, the process of reaching that point also has significant 'bottom-up' influence.

- 3.6 At the national level, the demand forecast – as need and demand are used interchangeably in this context – is generated by an econometric model; at the regional level, the process begins with consumption data supplied by the four-yearly regional Aggregate Minerals Surveys undertaken by the RAWPs.

National Demand Forecast

- 3.7 By far the most important determinant of the national aggregates demand forecast is the forecast of construction output, prepared every six months by Cambridge Econometrics. The model aims to capture the relationship between this estimate of Gross Value Added (GVA) in the construction sector and aggregates consumption, starting at the national level. The model accommodates separate variables for the aggregates-intensive and non-intensive construction sectors. It also makes a small allowance for the demand-dampening effects of the Aggregates Levy.
- 3.8 The model produces a reasonably close relationship between construction and aggregates use when applied to the construction output for the last 25 years. Forecasting ahead, discrepancies in the relationship between construction output GVA and aggregates use are overshadowed by fluctuations in the economy. The results published in 2008 failed to predict the recession, for instance.
- 3.9 The national aggregates consumption forecast is then split by type of source nationally. This is policy-led in the first instance. The Government is keen to promote the use of alternative aggregates, but recognises that there is a practical limit to what can be achieved. The forecasts therefore currently assume that the consumption of alternative aggregates of all kinds will rise to a maximum of 65mt annually in 2015 and then stay constant at that level. The Government also makes an assumption about net imports. These two assumptions are made first when describing the contributions to meeting national aggregates need, with the requirement for land-won primary aggregates being taken as the residual (though obviously the largest element). The land-won primary aggregates requirement is then itself broken down into contributing mineral sources – crushed rock, sand and gravel and marine aggregates – broadly reflecting market share at the time of the last Aggregate Minerals Survey.
- 3.10 Long term construction forecasts are recognised by the Government as unreliable. Data are considered useful for forecasting only for ten years from the survey date. This means that the forecasts used in the recent Guidelines, based on 2005 data, assume that demand after 2015 will be constant at the rate forecast for 2015. Also, to avoid the impression of unwarranted accuracy for any particular year, the demand forecasts are presented as cumulative numbers for the whole 16 year period.

Regional aggregates allocations

- 3.11 The process of apportioning the national demand forecast figure to the nine English Regions begins with the regional consumption data supplied by the four-yearly Aggregate Minerals Survey. The construction GVA growth rate for each region is applied to the average of the last three years' aggregates sales. However, these regional aggregates forecasts must sum to the national consumption total, so the regional forecasts are 'constrained' to do so.
- 3.12 As with the national aggregates forecast, the regional figures distinguish first the use of alternative aggregates, constrained to the national total within the context of policy. Net imports to England are also added in. Imports from Wales and Scotland are particularly important. The method used takes the total imports from outside England into each region from the Aggregate Minerals Survey (i.e. from Wales), subtracts exports to outside England, and then multiplies the result by 16 years. After allowing for alternative aggregates and net imports, the residual is the 'regional consumption to be met by primary production' in England.
- 3.13 The critical part of the process is to divide up the primary production requirements in each region so that they sum to the total consumption in all regions together. The primary production of aggregates as a percentage of consumption is calculated for each region, based on the most recent Aggregate Minerals Survey. Primary production can be taken directly from the Aggregate Minerals Survey tables. The consumption figure in each region is 'sales for use within the region' plus 'imports from other English regions'. In England in 2005 there were only two regions which were net exporters: South West and East Midlands. They had percentages over 100% whereas all other regions had percentages under 100%. In each region these percentages are then multiplied by the 'regional consumption to be met by primary production' figure previously obtained. In effect this assumes that inter-regional movements of aggregates remain fixed at 2005 rates. The resulting figures sum to the national total consumption forecast.
- 3.14 The resulting regional production obligation is then divided between material types: crushed rock, land-won sand and gravel and marine-dredged sand and gravel. This is undertaken on the basis of the proportion of sales of each type in the most recent Aggregate Minerals Survey. This regional apportionment process is evaluated in **Section 4**.
- 3.15 The regional guideline figures for aggregates provision in the nine English regions that arise from this process are then apportioned to sub-regions, and the approaches used to do this in each region are described further below, and evaluated in **Section 5**.

Wales

- 3.16 The WAG is required by law to promote sustainable development in the exercise of its functions. This has been applied to the planning of aggregate minerals. In 2002 the WAG commissioned a study which aimed "to assess the current methods and establish a new methodology for estimating demand and supply of aggregates based on sustainable aims." The objectives of the study included recommending a methodology to provide for a more sustainable

way of planning for aggregates, considering the practical interpretation of the environmental capacity approach.

- 3.17 The study articulated the ‘environmental capacity’ approach to aggregates for the first time in its report *Establishing a Methodology for Assessing Aggregates Demand and Supply* (Arup, September 2003) – known as the EMAADS report. This was followed by a further report commissioned by WAG on *Implementing the Methodology for Assessing the Environmental Capacity for Primary Aggregates* (Enviros Consulting, February 2005) – known as the IMAECA report. The objective of this study was “to ensure that the future primary aggregate supply is obtained from the most acceptable locations taking into account the availability of different types of geological resource for aggregates and the environmental capacity of areas in Wales to supply those aggregates.” These two reports set the framework for the two RAWPs in Wales, South Wales and North Wales, to use environmental capacity as one input to the process of establishing and apportioning the future requirements for aggregates amongst their authorities. The vehicle for this process has been a Regional Technical Statement by each RAWP explaining how they have applied the principles (October 2008 in South Wales and February 2009 in North Wales).
- 3.18 The IMAECA approach has been evaluated alongside the regional apportionment approach in England in **Section 4**, and the approaches used in producing the Welsh Regional Technical Statements are evaluated alongside the English sub-regional approaches in **Section 5**. The Regional Technical Statements, together with discussions with the RAWP officers, have formed the basis of these reviews.

The Environmental Capacity Methodology

- 3.19 The environmental capacity methodology developed for Wales is not an apportionment process. It simply makes a strategic assessment of the environmental effects of working aggregates in any particular location. The tool provides detailed information on the potential geological resource availability and on the environmental capacity to supply those resources, throughout Wales. It therefore covers potential as well as constraints, (insofar as aggregates can only be worked in geologically suitable areas and all areas are covered), and also permits users to interrogate eleven different geological resource types that are deemed in principle to be suitable for aggregates provision.
- 3.20 Environmental capacity assessment is carried out at the scale of the 1km square. The final output from the process is a ‘traffic light’ system, in which the scope for aggregates working is most acceptable in green squares, least acceptable in red squares and more equivocal in orange squares. This apparently simple outcome is reached through an extensive process of analysis of contributory issues, as follows.
- 3.21 First, 1km squares are completely ‘filtered out’ from further analysis before the application of ‘traffic lights’ if they contain:

EITHER less than 15% (or other percentage) of a selected geology of workable aggregate; **OR** are covered to at least 75% extent by any combination of key constraints:

- settlements
- World Heritage Sites
- Ramsar sites, SACs or SPAs
- National Nature Reserves
- National Trust land
- MoD training areas

3.22 Second, twelve environmental indicators are evaluated in each 1km square, using accurate GIS-based data. These were selected through EMAADS after review and consultation. Some are single issue constraints whilst others (*) combine a number of related features into one overall measure (see **Appendix 4** for details on the thresholds):

- Settlements
- Watercourses at risk from extraction activities*
- Standard of roads
- Land use class
- Nationally designated nature conservation sites
- Quality of cultural heritage*
- Public enjoyment*
- Nationally designated landscape areas*
- Locally designated landscape areas*
- Fixed plant/workings visible
- Nuisance from workings
- Cumulative impact of aggregates in the area

3.23 In each case a traffic light system is used, with chosen thresholds to distinguish the boundaries between the colours of the grading system. Where a package of measures is used, the highest constraint value is selected to set the colour of the traffic light.

3.24 Third, the tool allows the user to change how the environmental indicators are applied:

- (a) the thresholds between the traffic light colours can be changed for each indicator;
- (b) the importance of any one indicator relative to the others can be changed by the use of a weighting factor.

3.25 These measures are converted to a scoring system for each 1km square. Each individual square is segmented into red, orange and green to reflect the indicators. Bands are applied to the total score for each square: the final

single traffic light colour for each square depends on the bandings chosen for the scoring system.

National demand and regional aggregates allocations in Wales

- 3.26 Minerals Technical Advice Note 1 (MTANI) (2004) assumed that the current production of aggregates in Wales was typically 23Mt per annum and that this would not increase significantly over the following five years. This was based on 2001 Aggregate Minerals Survey information and made an appropriate adjustments for exports, imports and all types of aggregates. Taking into account the expected economic growth in Wales, it was not anticipated that demand for aggregates would exceed 23-27 million tonnes per annum by 2010.
- 3.27 The proportion of this national demand for aggregate identified through MTANI, was then apportioned to North and South Wales based on the past proportion of supply: 9mt per annum for North Wales and 14mt per annum for South Wales.

SUB-REGIONAL APPORTIONMENT METHODOLOGIES

- 3.28 In England, each of the nine regions must apportion their allocation of the National Guidelines for Aggregates Provision to the individual MPA (or group of MPAs). The approach taken in each region is summarised in **Table 3.1**, with descriptions of the methodologies used provided below.
- 3.29 The purpose of this section, including Table 3.1, is to describe the different approaches to apportionment as they were attempted by the Regional Assemblies and/or the RAWPs. It is acknowledged that the apportionment methods used in each region reached varying points of completion and have been applied in practice to varying degrees. As such, the final outcome in each case is summarised in **paragraphs 3.76 to 3.80**

Table 3.1: Summary of Sub-regional apportionment methodologies

English Region	Author	Overview of Methodology
South East	LUC for the South East England Regional Assembly	Based on weighting criteria related to construction demand, past sales and environmental designations to develop apportionment options.
London	London Aggregate Working Party	Based on the location of viable resources in the London region.
East of England	East of England RAWP	Based on historical data, specifically an average of sales/production over the last 10 years.
South West	Capita Symonds for South West Councils	Based on the development and appraisal of 3 scenarios: 1) status quo/pro rata; 2) environmental (including landscape and heritage); 3) known markets, applied to 'resource blocks'.
East Midlands	Sub Group of East Midlands RAWP	Baseline scenario developed using past sales; discussions then held with MPAs and industry to take account of a range of factors such as availability of the resource, impacts on landscape, and adjustments made to baseline.

English Region	Author	Overview of Methodology
West Midlands	LUC for West Midlands Regional Assembly	Based on weighting criteria related to demand, past sales, unsterilised resource and landscape, heritage and environmental constraints to develop apportionment options.
Yorkshire and Humber	LUC for Yorkshire and Humber Assembly	Based on weighting criteria related to construction demand, past sales and environmental designations to develop apportionment options.
North East	North East Assembly and RAWP with Entec	Development of 4 scenarios based on: the existing pattern of supply; the presence of potential resources; the presence of potential resources with an emphasis on supply from within the key market areas; and, comments received from the Steering Group.
North West	Sub Group of the North West RAWP	Development of 3 scenarios based on past sales.

South East

3.30 SEERA commissioned LUC in 2007 to develop a revised methodology for the sub-regional apportionment of land-won primary aggregates (including crushed rock) having regard to sustainability and practical factors. Those identified at the time were (in no order of priority):

- i Population/household growth projections (as a proxy for demand)
- ii Patterns of current supply
- iii Aggregate resources in each sub-region
- iv National and International environmental designations, and planning or policy designations including Green Belt and degree of constraint on resources
- v The proximity to, and feasibility of using, sustainable transport modes (rail and water)
- vi Other planning, economic and practicability considerations.

3.31 The resulting revised methodology was developed in association with the project Steering Group consisting of representatives from the South East MPAs, SEERA, the South East England Regional Aggregate Working Party (SEERAWP), DCLG, the Environment Agency, Natural England, English Heritage and Industry. The methodology underwent four stages of development:

3.32 Stage I: An initial set of proposed criteria (key considerations that might influence the supply and use of primary aggregates) were presented to the Steering Group as a draft methodology for discussion. These were the location of mineral resources, patterns of past use, development pressure, population/households, sustainable transport, contracts and patterns of movement and environmental constraints.

3.33 Stage 2: Responding to comments from the Steering Group, revised criteria and datasets were presented to the Steering Group as a briefing note for discussion. A final set of criteria for inclusion in the apportionment methodology was agreed with the Steering Group, combining initial considerations into four criteria:

- Criterion 1: Construction Demand (with a ratio of 1:9 for 1a and 1b)
 - Criterion 1a: Future (Housing provision)
 - Criterion 1b: Current (Existing population)
- Criterion 2: Past Sales
- Criterion 3: Unsterilised resource⁶ outside of international designations (+250m buffer)
- Criterion 4: Unsterilised resource outside of international designations (+250m buffer) and outside of national designations.

3.34 Stage 3: The selected criteria were then weighted in varying amounts to create potential options for the apportionment. Therefore, all options considered all criteria, but to varying degrees. The initial options were discussed and revised with the Steering Group.

3.35 Stage 4: Six final options were agreed with the Steering Group:

Option A: weighted towards on sales – referred to as ‘Past sales’.

Option B: weighted towards supply i.e. unsterilised resources outside of international designations (+250m buffer) – referred to as ‘Resource’.

Option C: weighted towards construction demand – referred to as ‘Demand’.

Option D: weighted towards unsterilised resource outside of international designations (+250m buffer) and outside of national designations – referred to as ‘Environmental’.

Option E: evenly weighted between demand and resources, but with more emphasis on demand arising from existing population – referred to as ‘Demand and resource’.

Option F: evenly weighted between all four criteria – referred to as ‘Equal weighting’.

3.36 The Steering Group then made recommendations to SEERAWP on the preferred option(s), who then had the opportunity to review the options and recommend a final option to the Regional Assembly for inclusion in the South East Plan.

London

3.37 The London Plan (Consolidated with Alterations since 2004), on the recommendation of the London Aggregates Working Party (LAWP) provides for 1 million tonnes per annum (mtpa) regional apportionment for London to be split equally (0.5mtpa each) between East London (specifically the London Boroughs of Havering and Redbridge) and West London (London Boroughs

⁶ Unsterilised resources are minerals resources that have not been sterilised by built development.

of Ealing, Hillingdon, Hounslow and Richmond-upon-Thames). This is lower than the 1.1mtpa in the 2001-2016 National Guidelines for Aggregates Provision in recognition that marine aggregate supplies to London exceeded the guideline assumption. The sub-regional apportionments for East and West London were based on the known viable resource in the London region from the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction.

- 3.38 The 2005-2020 National Guidelines for Aggregates Provision again set 1.1mtpa for London, but the London Plan retained a figure of 1mtpa. However, following a report to LAWP on a sub group meeting between industry and the key four London Boroughs, the GLA proposed Minor Alterations to the Draft Replacement London Plan suggesting that the London apportionment should be reduced to 700,000 tonnes per annum, and that specific figures be set for four London Boroughs. London Boroughs of Hillingdon and Havering would have to make provision for sub-regional apportionments of 250,000 tonnes per annum, with Hounslow and Redbridge receiving lower sub-regional apportionments of 100,000 tonnes per annum.
- 3.39 A LAWP meeting in September 2010 considered these proposed Minor Alterations. The Boroughs favour them as more realistic for the London Plan period to 2030, reflecting the extent of the aggregate resource and constraints, and also setting a clear target for the four Boroughs (with any extraction in other Boroughs regarded as a bonus). The minerals industry oppose them as having insufficient environmental assessment, and that the right procedure is for the 1.1 mtpa in the Guidelines to be adopted, and sub-regional apportionment for each Borough should be tested at the individual Mineral Development Plan Document public inquiry stage.
- 3.40 In undertaking this review it is acknowledged that the situation in London is unique amongst the English regions, in that the constrained nature of the remaining resource restricts the potential for alternative options for aggregates extraction to be identified.

East of England

- 3.41 In response to the National Guidelines for Aggregates Provision, the East of England RAWP agreed that the sub-regional apportionment should be based on historical data, specifically an average of sales/production over the last 10 years. The EERAWP did consider the approaches being taken in other regions such as the South East, but took the view that the current apportionment was effective and therefore no change was required.
- 3.42 Using this approach, the 2005-2020 Guidelines were apportioned to the six MPAs/groups of MPAs (Bedfordshire Historic County; Cambridgeshire and Peterborough; Essex, Southend and Thurrock; Hertfordshire; Norfolk; and, Suffolk) and the figures included in the approved draft East of England Plan (March 2010).

South West

- 3.43 South West Councils (SWC) appointed Capita Symonds Limited (CSL) to develop three scenarios for undertaking the sub-regional apportionment of aggregates in the region:
- Scenario 1) A status quo scenario: continuation of pro rata proportional share to supplies that has previously been used in the region;
 - Scenario 2) An environmental scenario: meeting guideline requirements whilst minimising exploitation of aggregate resources in environmentally sensitive areas; and,
 - Scenario 3) A known markets scenario: looking at markets in the South West and possibly beyond and investigating a sub-regional approach to supply based upon proximity to local aggregate resource areas, including how markets could be supplied and potential for sourcing aggregates from outside shortfall areas.
- 3.44 Scenarios 2 and 3 were intended to be illustrative examples of the many options for modifying the existing, historically influenced pattern of supply, and in many respects they represent extremes in the range of options available. The intention was that, by looking at these extremes, consideration could be given to the desirability (or otherwise) of moving away from the existing approach to apportionment, as represented by Scenario 1. However, the practicalities of developing Scenario 3 and difficulties with the suggested methodology led to this option being dropped from further consideration.
- 3.45 SWC, with the Mineral Planning Authorities (MPAs), resolved to undertake the sub-regional apportionment process on a resource block basis rather than by individual or groups of MPAs. The resource blocks reflect the various sources of supply in the South West, divided into groups based on a combination of technical similarity and geographical location. For example, Resource Block B is Carboniferous & Devonian Limestone, Somerset and Devon. This allowed the identification of specific types of aggregate in certain locations that are facing a shortfall in permitted reserves, alongside consideration of which alternative sources of aggregate could be used should substitution be seen as an appropriate way forward.
- 3.46 The common basis for the Scenarios was the identification of resource blocks facing a shortfall in permitted reserves. Such shortfalls were then investigated to establish whether, under each Scenario, there would be difficulties in finding new permitted reserves within the resource block to meet the shortfall requirements. As such, the actual apportionment of the regional guideline figure to each resource block was undertaken prior to consideration of the Scenarios and therefore is common to all Scenarios. The apportionment itself was undertaken on the basis of the percentage contribution of each resource block to the regional production of crushed rock and sand & gravel (based on an average of 2001 and 2008 production figures). The percentage contributions to past production were then applied to the regional guideline figure to establish the total apportionment required from each resource block.

East Midlands

- 3.47 The apportionment methodology for the East Midlands region was developed and implemented by the East Midlands Aggregates Working Party (EMAWP) as described in the document entitled Sub-regional Apportionment 2009.
- 3.48 The East Midlands RAWP used an iterative apportionment methodology centred on refining an initial sub-regional apportionment based on past sales through consideration of key policy areas and issues. Although separate sub-regional apportionment scenarios or options were not produced in parallel for comparison and/or assessment, the key policy areas and issues considered during the iterative process covered many environmental issues, in effect producing an alternative sub-regional apportionment through each iteration.
- 3.49 The methodology followed seven steps:
1. Determine whether the apportionment for the East Midlands from the National and Regional Guidelines is fair and reasonable by comparing annual average Guideline figure for England and for the East Midlands with past production (2001 – 2007).
 2. If the apportionment is considered to be unfair, discuss with DCLG; if considered to be fair calculate average percentage contributions to aggregate production by MPA over the last seven years.
 3. Multiply the Regional Guidelines figure by average MPA percentage contributions over the last seven years, to provide a baseline sub-regional apportionment.
 4. Compare the output from Step 3 with landbanks to calculate any shortfalls or surpluses within each MPA.
 5. Consider whether any shortfalls or narrow-margin surpluses can be met through available resources in each MPA, or whether other relevant MPAs can meet them through permitted reserves.
 6. Address key policy areas and other issues: Reducing supplies from the Peak District National Park and Lincolnshire Wolds AONB, long term prospects for igneous rock in Leicestershire, implications for depletion of resources in the Idle Valley, long-standing issues regarding sand and gravel supply in Northamptonshire.
 7. Re-run Steps 2-5 in response to outcomes of Step 6.
- 3.50 The 2009 Guidelines were first discussed by EMAWP on 3rd August 2009, alongside a briefing paper prepared by the RAWP Secretary, which set out a proposed approach (the seven steps detailed above) and included draft statistics covering the early stages of the exercise. The methodology was agreed in principle, and a number of issues highlighted for more detailed examination by a Technical Sub-Group (those listed under Step 6). The Technical Sub-Group met twice (21st September and 16th October 2009) to discuss the issues raised. Each issue was considered during these roundtable discussions, drawing on the technical expertise of the people present and collective knowledge of the problems facing the extractive industry in the region.

- 3.51 In the case of reducing supplies from the Peak District National Park (as sought after by national policy) Derbyshire County Council and the Peak District National Park Authority discussed the issue separately, and resolved that Derbyshire County Council would progressively increase its contribution to the sub-regional apportionment, taking up a progressive decrease by the Peak District National Park.
- 3.52 The issues considered in the East Midlands are fully documented in the Sub-regional Apportionment 2009 Report. The Report explains that where potential supply problems were identified, they were examined and resolved through roundtable discussions and compromise.

West Midlands

- 3.53 Two methodologies were employed for developing sub-regional apportionment options in the West Midlands: one undertaken by the West Midlands Regional Aggregate Working Party Technical Secretariat based on past sales trends (referred to as the “WMRAWP options”); and another commissioned by the West Midlands Regional Assembly (WMRA), which sought to take account of the likely availability of materials, future patterns of development, environmental and other considerations (referred to as the “Assembly options”).
- 3.54 To initiate the development of the Assembly options it was considered that the key considerations that might influence the supply and use of primary aggregates fell into one of three categories. The first was demand, with the intention being to establish a reliable measure of where building materials are likely to be required in large quantities in the future. Existing population and future housing fell into this category. The second category was supply, reflecting the location of unsterilised resources. The third category was termed constraints, and included those considerations that may constrain the ability of a sub-region to provide for the supply of material. Generally it was assumed that these would be environmental (nature conservation and landscape designations) and heritage constraints.
- 3.55 It was agreed that an apportionment methodology which reflected these considerations could also be designed to accommodate weighting, thereby making it possible to formulate and test different apportionment scenarios.
- 3.56 Taking the key considerations into account, the methodology used to develop the Assembly options was undertaken in seven stages:
- Stage 1: Factors for consideration were discussed at a meeting of the Steering Group and a group of MPAs.
 - Stage 2: Five draft options for apportionment were presented to the Steering Group and WMRAWP.
 - Stage 3: A revision of draft options followed, which incorporated suggestions and recommendations. These were written up in a draft report which was circulated by WMRA for a technical consultation with the WMRAWP.
 - Stage 4: Technical stakeholder consultation on the draft options was undertaken. The consultation provided members of the WMRAWP

and MPAs with an opportunity to comment on the methodology and draft options.

- Stage 5: Two new options for apportionment were introduced as a result of feedback from the technical consultation undertaken in Stage 4.
- Stage 6: Further limited technical stakeholder consultation on the two new options was held with the WMRAWP, including a meeting of the Regional Minerals and Waste Officers Group (RMWOG).
- Stage 7: Final alternative options for apportionment were developed and reported, taking into account feedback from the consultation undertaken in Stage 6.

Yorkshire and Humber

- 3.57 The 2004 Annual Report of the Yorkshire and Humber Aggregates Working Party confirms that there were adequate permitted reserves of crushed rock aggregate in the region to meet regional guidelines. The methodology adopted for apportioning crushed rock therefore reflected existing historic shares, using an average over the 5-year period 1997 to 2001.
- 3.58 Evidence suggested that identified permitted reserves of sand and gravel at the beginning of 2001 were 55 MT – a shortfall of 18 MT and the Annual Report identified the need for a region-wide study to assess the environmental impacts of additional sand and gravel extraction and the ability of aggregate producing areas to absorb these impacts. Consequently, the British Geological Society (BGS) were commissioned in 2004 to complete the first phase of this study. This helped to identify the extent of potential reserves of sand and gravel suitable for use as concrete aggregate reserve, and how these relate to environmental constraints in the region. In doing so, a range of useful planning and GIS datasets were drawn together.
- 3.59 Following on from the BGS study, LUC were commissioned by the Regional Assembly to develop and appraise spatial options for the sub-regional apportionment of land-won sand and gravel to 2016, with the view to recommending an option that performs best on sustainability grounds. A number of underlying criteria were used to characterise the range of spatial options for apportioning the shortfall, related to supply, demand and environmental considerations.
- 3.60 Working closely with a steering group of RAWP members and others, different weightings were attached to each criterion, altering the apportionment and allowing for different spatial options to be generated by Sub-Region (grouping of MPAs). The focus throughout this process was on developing reasonable, realistic and relevant options, rather than those based on extremes. The five resulting options were then appraised by LUC using a set of objectives based on those used for the SA/SEA of the RSS.

North East

- 3.61 The North East RAWP identified three scenarios for the apportionment of aggregates in the region, one based on recent sales information, the second based on potential resources and the third on potential resources and market

location. NERAWP then commissioned Entec to develop these scenarios and undertake an environmental appraisal of the results.

- 3.62 Scenario 1 used sales information presented in the RAWP reports from 2001 to 2007 to determine the proportion of sales each sub-region provided during this period. This information was then used to split the North East regional guideline figure.
- 3.63 In order to establish the potential resources which could be worked in each sub-region for the development of Scenario 2, the MPAs provided information on the existing permitted reserves (2007), planning applications awaiting determination, pre-application enquires from operators and submissions made to LDFs. The total potential resource for each sub-region was then used to identify the proportion of the North East regional guideline figure that should be allocated to each sub-region.
- 3.64 Scenario 3 (potential resources and market location) was developed as it was acknowledged that the greatest demand for aggregate materials is likely to be found in the Tees Valley and Tyne and Wear and therefore greater account should be taken of the potential resources available in these two sub-regions. However, this was moderated by the acknowledgement that there will also be some significant market requirements coming from Durham and Northumberland (e.g. New Growth Points). The amount of material identified for the Tees Valley and Tyne and Wear in Scenario 2 was increased to reflect their greater share of the market. The amounts were increased to 70% of the total potential resources identified for Tees Valley and Tyne Wear, which was considered high enough to reflect the focus of the market in these areas but low enough to account for the other market pressures in Durham and Northumberland. This approach helped to minimise the transport of materials from source to the markets.
- 3.65 As a result of the comments received from the Steering Group on Scenarios 1, 2 and 3, it became apparent that there were a number of local issues regarding sand and gravel which were not being picked up fully by these scenarios. A fourth scenario (potential resources and steering group comments) for sand and gravel was therefore developed to give sufficient weight to all of the comments received. The figures identified in Scenario 2 were used as a starting point in order to ground the figures against an established evidence base. Scenario 4 was further amended following a full RAWP meeting to include consideration of further comments received.

North West

- 3.66 The North West RAWP Technical Secretary (Cheshire West and Chester Council) presented the report *Draft Paper on Proposed Sub-Regional Apportionment Methods for the North West* to the RAWP in December 2009. It set out four potential methodologies for the sub-regional apportionment:
1. Five year average production AM2003-2007 published figures.
 2. Five year average production AM2004-2008 unpublished figures for 2008.
 3. Five year average production AM2004-2008, deleting the highest and the lowest production years.

4. Continuation of the 2003 percentage split.
- 3.67 The RAWP agreed that methods 2 and 4 should be taken forward with an extra model using a 10 year average; methods 1 and 3 should be dismissed. All options are based on previous sales:
- Option 1: Five year average production AM2004-2008, deleting the highest and the lowest production years.
 - Option 2: Continuation of the 2003 percentage split.
 - Option 3: Ten year average production AM2004-2008.
- 3.68 The three options were presented at the RAWP meeting in July 2010. Option 2 had no support, Option 1 had the support of the two Cheshire unitary authorities (Cheshire West and Chester and Cheshire East); Option 3 had the support of the Greater Manchester sub-region (including Merseyside and Warrington) and Lancashire. Cumbria did not support any of the three options. A compromise was reached, taking forward Option 3, but using an eight year supply.
- 3.69 Revised Option 3 is the preferred option for the sub-regional apportionment from the North West RAWP. It was a majority decision (Cheshire, Lancashire and Greater Manchester, including Warrington and Merseyside). Cumbria did not agree the option and therefore the report will be taken forward with Cumbria dissent.

North and South Wales

- 3.70 The process of apportioning aggregates requirements between local planning authorities in Wales has changed in the last ten years in an effort to become more sustainable.
- 3.71 The South Wales and North Wales RAWPs have run their arrangements in parallel. The methods used have been largely the same: for the purposes of this report they are treated as one, with specific differences highlighted where appropriate. The principal difference between the two regions is that North Wales exports a substantial proportion of its output (3.75mt in 2005, comprising 54% of the region's 6.90mt production that year) to England, mainly to North West England. Crushed rock is the main component of this (88% of exports). Virtually all of this is exported from North East Wales, whereas North West Wales is largely self-sufficient in aggregates with little movement of aggregates in or out.
- 3.72 The Foreword to the South Wales Regional Technical Statement (RTS) succinctly describes the approach used in practice:

“The RTS seeks to achieve a more sustainable approach to the provision of aggregates. Instead of the traditional ‘predict and provide’ process of determining how much aggregate is being sold and then providing sufficient reserves to meet the demand, a more sustainable approach has been adopted. In essence, this new process determines what is happening now and whether or not based on (a) the population of the area (b) the reserves of the area (c) the environmental capacity of the area (d) the natural resources of the area, and (e) the proximity principle, existing patterns of supply need to change” (p5).

3.73 Expressed this way, it is clear that the future pattern of aggregates supply is not to be driven by the environmental capacity method outlined above (under the regional apportionment methods). The environmental capacity assessment is just one input to the sub-regional apportionment. The RAWPs' method of apportionment as an alternative to the conventional approach was expressed as follows:

“Two sets of sustainability policies have been brought into play in shaping this method. Firstly the proximity principle (i.e. reducing journey lengths) which aims to source material from as close as possible to the consumer. Secondly, future working should be focussed upon those areas which have the greater environmental capacity to accommodate future working. This method therefore seeks to use the distribution of population as a proxy for the distribution of demand” (South Wales RTS, paragraph 4.4).

3.74 In the practical application of this approach, the use of the proximity principle appears to have dominated. The proximity principle is strongly advocated in WAG's policy statement Minerals Technical Advice Note 1 (MTANI, paragraph 40).

3.75 The environmental capacity implications of meeting aggregates requirements were considered briefly, though the pattern of distribution proposed was led overwhelmingly by the proximity principle rather than the traffic light system for environmental capacity used in IMAECA.

SUMMARY OF PLANNED AND FINAL APPORTIONMENTS

3.76 Of the nine English regions, six opted to trial the development of an apportionment methodology that differed from generating an apportionment based solely on past sales information:

- London used information regarding the known viable resource and constraints on extraction;
- North East took into account sales, potential resources, market location and local issues; and,
- South West sought to develop three scenarios, one based on past production, one on reducing exploitation in environmental sensitive areas and one based on known markets.
- The apportionment methodologies used in the South East, West Midlands and Yorkshire and Humber took into account demand, past sales and a range of environmental constraints.

3.77 In London, although the overall amount to be apportioned has been revised and queried, the final apportionment option was generated using the process described above. In the North East and South West, the process of apportionment was interrupted by the change in government and the resulting uncertainty relating to the regional level of planning; therefore neither process was brought to a conclusion.

- 3.78 Both the South East and West Midlands apportionments were accepted by the Regional Assemblies, although the West Midlands RAWP supported an apportionment based on past sales data. Most recently (February 2011), the status of the West Midlands Regional Assembly's apportionment⁷ has been questioned through the Inspector's Report on the Shropshire Core Strategy DPD. The Report states that "*issues about the overall and sub-regional apportionments for aggregates are matters to be determined by the West Midlands RAWP*" and as the RAWP supported an alternative apportionment based on past sales data, the Inspector concludes that Shropshire County Council's stance, which reflects that of the RAWP, should be included in policy.
- 3.79 In Yorkshire and Humber, the RAWP Secretaries Group decided that none of the scenarios resulting from the described apportionment process were acceptable, primarily due to a lack of data on sand and gravel resources. Further information on resources was commissioned from BGS which led to a decision to continue with the current apportionment due to a lack of adequate resources and local planning constraints in the south of the region.
- 3.80 The remaining three regions – North West, East of England and East Midlands – used past sales to establish the apportionment for the MPAs in each region. In the East of England, the resulting apportionment was published in the Draft East of England Plan >2031 (March 2010), and similarly in the East Midlands, the resulting apportionment was published in the Revised Draft East Midlands Regional Plan (Partial Review) (March 2010). In the North West, the sub-regional apportionment was agreed by a majority decision within the North West RAWP, however, due to changes within the planning system, this has yet to feed into planning policy.

OTHER RESEARCH AND REPORTS

The Scottish System

- 3.81 Scottish Planning Policy 4: Planning for Minerals (SPP4) sets out the planning policy framework for the extraction of minerals. Unlike England and Wales, Scotland did not adopt the managed aggregates supply system recommended by the Verney Report (1976)⁸, but instead relies on monitoring supply and production levels and using this information to ensure that sufficient permitted reserves are available.
- 3.82 SPP4 recognises that minerals are an important primary resource and that there is a continuing need for an adequate and steady supply of minerals for a variety of purposes. The minerals industry supports the economy through the provision of raw materials for construction, manufacturing, agriculture and other specialist sectors. As a result of this importance to the construction industry, SPP4 applies a landbank policy to the provision of aggregates.

⁷ West Midlands Regional Assembly (2010) Interim Policy Statement: Sub-Regional Apportionment of Construction Aggregates

⁸ Department of the Environment, Scottish Development Department, Welsh Office HMSO, 1976. *Aggregates: the way ahead: Report of the Advisory Committee on Aggregates.*

- 3.83 With regard to construction aggregates, SPP4 goes on to say that to achieve an adequate supply, structure plan authorities and authorities working together on strategic development plans should provide a landbank of permitted reserves taking into account lead-times and any evidence provided on the contribution from imports, recycled and secondary materials. The landbank should be equivalent to a minimum 10 years extraction at all times for the appropriate part of the city region market area. The Scottish Government's view is that the city regions for the four largest cities should form the principal market areas for the provision of construction aggregates.
- 3.84 However, local authority boundaries do not always provide an adequate basis for market definition and provision of supply, therefore, the requirement for a minimum 10 year landbank also extends to some adjoining local authorities, particularly in the central belt, where their output contributes to the main market area in the city regions. Elsewhere it is the responsibility of individual planning authorities to decide on an appropriate 10 year landbank, with the scale of the landbank set out in the local plan and, in due course, local development plans. SPP4 also states the importance of stakeholders, including the aggregates industry, engaging in consideration of landbank issues.
- 3.85 Scotland differs from England in terms of the much smaller scale of its aggregates consumption and the much larger size of its aggregates resources, especially those of crushed rock. Consequently the requirements of a managed aggregates supply system are clearly different from those in England.⁹

Other research

- 3.86 In addition to the apportionment methodologies described above, other background documents were identified that might also provide some helpful input into the development of an alternative apportionment methodology:
- Aggregates Industry Horizon Scan (June 2010) Produced for the Minerals Industry Research Organisation by Arup.
 - An Ecosystems Approach to Long Term Mineral Planning in the Mendip Hills: Phase 1 (2009) Somerset County Council, Natural England and Cuesta Consulting Limited.
 - An Ecosystems Approach to Long Term Mineral Planning in the Mendip Hills: Phase 2 (2010) Somerset County Council, Natural England and Cuesta Consulting Limited.
 - Good Practice Guidance on the Environmental Appraisal of the Provision of Aggregates (January 2004) Office of the Deputy Prime Minister.
 - Managing aggregates supply in England: A review of the current system and future options (2008) British Geological Survey Open Report OR/08/042.

⁹ BGS, 2008. *Managing aggregates supply in England: A review of the current system and future options*.

4 Evaluation of Regional Apportionment Methodologies

INTRODUCTION

- 4.1 This section provides a summary of the strengths and weaknesses of the regional aggregates apportionment methodology adopted in England and Wales. The criteria-based evaluation of the national demand forecast and apportionment of the national figure to the nine English regions is provided in **Appendix 2**.

REGIONAL APPORTIONMENT METHODOLOGY IN ENGLAND

Strengths of the approach

- 4.2 The Government strongly prioritises the use of secondary, recycled and marine aggregates in place of primary sources, recognising the overall environmental advantages of the former¹⁰. These priorities are reflected in the apportionment method.
- 4.3 The principles of the method used to generate the national demand forecast and subsequent regional allocations are published, and the report on the methodology explains where assumptions have been made. However, not all assumptions are fully explained or justified.
- 4.4 The output of the allocations is tied to the standard regions. This in turn enables sub-regional apportionment to MPAs.
- 4.5 Preparation of the Guidelines, which includes the regional allocations, is assisted by the RAWPs and their National Co-ordinating Group, providing representation of the principal stakeholder interests.

Weaknesses of the approach

- 4.6 Environmental issues are only incorporated into the regional aggregates apportionment methodology by proxy, through a preference for alternative and marine aggregates over land-won aggregates. However, no consideration is given directly to any particular environmental issue such as landscape, biodiversity or climate change.
- 4.7 Technical limitations of the method include that:
- consumption data for primary aggregates are only available every four years from the Aggregate Minerals Surveys, most recently from 2005, while data on alternative materials depend on intermittent specially-commissioned surveys by DCLG; even so, data on the use of asphalt road planings still rely on a study from 1991;

¹⁰ Department for Communities and Local Government (2006) Minerals Policy Statement 1: Planning and Minerals

- surveys on the production and consumption of construction and demolition waste and of secondary aggregates do not produce wholly accurate data;
 - the consumption of some secondary sources is not recorded at all, e.g. shale, so production figures from the Annual Mineral Raised Inquiry are used instead and sales assumed to be distributed only locally.
- 4.8 The apportionment methodology used generates a single apportionment option, using the most recent four-yearly Aggregate Minerals Survey as the basis for a number of factors, with no other options considered. The draft Guidelines, and generally speaking the published ones, therefore do not take into account any change in the ability (or ‘environmental capacity’) of regions to contribute to supply in future compared with recent experience. Change in this respect comes about through market forces despite the Guidelines rather than because of them, and can only be taken into account – to the extent that it has already happened – in the next round of the process.
- 4.9 The method used to generate the allocations is so complex that it is widely regarded as a ‘black box’. Although the principles of the method used to generate the national demand forecast and subsequent regional allocations are published, the model into which the data are fed is not readily available for practical use. Extensive data sets are used to develop the regional demand estimates which underpin the allocations, including: regional construction GVA data by sector and trend data on the aggregates intensity of expenditure on construction by sector. Data availability here is poor. Consultants are employed to generate the demand forecasts on which the method relies, and those in turn depend upon using forecasts for the construction industry which are held by Cambridge Econometrics.
- 4.10 The key assumption of the methodology for the national demand forecast and apportionment of the national figure to the nine English regions is that future patterns of supply will mirror the delivery of that past pattern, including:
- i) imports from Wales (and exports beyond England) are assumed to be the same for the whole Guidelines period (2005-2020) as they were in the most recent aggregates monitoring survey year (2005);
 - ii) inter-regional movements of aggregates remain fixed at the rates in the most recent aggregates monitoring survey year;
 - iii) the proportions of regional supply from crushed rock, land-won sand and gravel and marine-dredged sand and gravel will remain the same as those in the most recent aggregates monitoring survey year.
- 4.11 The result of the English regional apportionment methodology is that environmental issues are not taken into account during the process. There is no consideration of the impacts of extraction or the transportation of aggregates within and between the regions.

ENVIRONMENTAL CAPACITY IN WALES

Strengths of the approach

- 4.12 The IMAECA approach is a strategic information tool, appropriate for use at the national and RAWP scales. It informs the apportionment process (by indicating greater or lesser environmental capacity of all places to accommodate aggregates working), but is neither an option nor an apportionment process in itself.
- 4.13 An entirely uniform method is applied across the whole of Wales so that all places are treated equally; this still applies if thresholds or weightings are changed. The result in the form of 'traffic lights' is readily comprehensible, providing a measure of relative merit between all places.
- 4.14 The IMAECA method affords considerable weight to geology: the database can be interrogated by numerous geological types to identify the degree of constraint on each. Once the data has been obtained and digitised for use in a GIS, the manipulation is straightforward allowing the exploration of 'what if...' scenarios. It is therefore flexible and can be tested for sensitivity to any chosen adjustments to thresholds or weightings. The GIS tool is reasonably easy to use.
- 4.15 The methodology assists SEA, particularly through the collection of baseline information, assessment of geographical alternatives, and predicting effects.

Weaknesses of the approach

- 4.16 As a result of the number of issues considered, the initial data requirements are large, with implications for cost and timeliness. The information required was found to be available in, or capable of being put into, the required GIS format, though the resolution of the raw data varied and this affected the accuracy of the assessment system. (Note that the main problem encountered in Wales at the time (in 2004) was that the BGS data on geology in the remoter parts of Wales was less accurate than desired, though the Welsh Assembly had an ongoing project to commission work to fill the gaps. This therefore does not appear as a permanent or irresolvable problem.)
- 4.17 Consultation informed the EMAADS report but the level of stakeholder input into IMAECA was very low and there was certainly no public consultation. The method is therefore conceptualised as technical, providing a professional input to a process rather than itself being part of the evaluation process. In practice, though, there is considerable use of judgement in selecting the thresholds between the traffic light colours and the weightings between the indicators (as even treating them as each having the same weight is a judgement). This weakness is moderated by the need for the decision-maker (the RAWP) to decide the thresholds and weightings, which ensures that more qualitative judgements can be brought to bear on the decisions.
- 4.18 The tool can be unpicked and understood in detail, but it lacks immediate transparency. The large number of assumptions, principally in the thresholds, tends to make the tool unfriendly to casual users.

- 4.19 The tool cannot be used at a scale lower than the RAWP. The EMAADS report advised against its use in anything more than an illustrative fashion in the preparation of local authority development plans, and it cannot be used in a development control context.
- 4.20 Even with the substantial resource which this tool represents, this is only one input into the process of apportioning aggregates requirements between authorities, and that requires the full process of gathering other information, considering options and evaluating them. The procedure as a whole is therefore time consuming, though this is not a direct weakness of the environmental capacity approach per se.

5 Evaluation of Sub-regional Apportionment Methodologies

- 5.1 This section provides a summary of the strengths and weaknesses of the sub-regional aggregates apportionment methodology adopted in each of the regions in England and Wales. The summaries are based on the evaluation process described in **Section 2**. The detailed results of which are available in **Appendix 3**.
- 5.2 Summary tables setting out the strengths and weaknesses against the criteria set out in Section 2 (**Table 2.1**) are provided for each region (**Tables 5.1 to 5.10**), and amalgamated into a single table at the end of this section (**Table 5.11**). The key for the tables is:



SOUTH EAST

Strengths

- 5.3 All major environmental issues appropriate for consideration at the regional level were incorporated into the methodology, including international and national nature conservation, landscape and cultural heritage designations, to calculate the area of 'unconstrained' resource outside of these designations. Reasoned justification was provided as to why other environmental factors were not included as follows:
- Floodrisk zones - this type of development (i.e. primary aggregate extraction) is considered 'water compatible' - the nature of the material means that it is mainly going to be found in floodplains;
 - Groundwater source protection zones - site management can overcome the potential constraint;
 - Safeguarding around aerodromes – site management can overcome the potential constraint;
 - Green Belt – mineral extraction is an acceptable use in the Green Belt;
 - Local designations and non-spatial designations such as habitats of Principal Importance – it was not seen as appropriate at this level (sub-regional) to consider local and non-spatial environmental designations as these should be assessed strategically by the MPA as part of its environmental responsibilities in line with their regional biodiversity action plan (BAP) targets, PPS9 and the relevant South East Plan policies.
- 5.4 Consideration was given to using the density of sustainable transport links. Due to a number of limitations associated with this - sustainable transport modes do not necessarily link source with demand; an area could have lots of depots but no resource because material is imported; there is at present very little transport of aggregates by water or rail from internal sources in the South East - it was agreed that sustainable transport should be omitted as a

criterion in the sub-regional apportionment. However, it was recognised that the inclusion of a criterion related to construction demand would encourage supplies in close proximity to demand.

- 5.5 The development of options followed an iterative process of development with the Steering Group. Six alternative spatial options were developed, covering a range of criteria (including environmental criteria) agreed by the Steering Group to influence the supply and use of primary aggregates:
- Option A: 'Past sales'
 - Option B: 'Resource'
 - Option C: 'Demand'
 - Option D: 'Environmental'
 - Option E: 'Demand and resource'
 - Option F: 'Equal weighting'
- 5.6 The apportionment process is transparent, with judgements made explicit and based on the best available evidence. Options were generated using quantitative and spatial (GIS) data to quantify the different criteria agreed to influence the apportionment. The six alternative options were created by feeding the datasets into a Microsoft Excel based database, and using multi-criteria analysis, applying weightings to each criterion to reflect the strength of influence of each criterion. The data used was readily available e.g. housing provision figures from SE Plan, unsterilised resource outside the area of international designations (+250m buffer).
- 5.7 Each dataset had its own complexities, but could be obtained from readily available data sources for the most part (except the BGS geological data). Despite this, with the necessary expertise and software, and following the method described in detail in the Final Report¹¹, the method could be replicated relatively easily. The spatial definition of the apportionment options generated was per MPA / group of MPAs.
- 5.8 A Steering Group consisting of representatives from the full range of relevant stakeholder interests (the South East MPAs, SEERA, the South East England Regional Aggregate Working Party (SEERAWP), DCLG, the Environment Agency, Natural England, English Heritage and minerals industry) met regularly to discuss the approach to the apportionment methodology and to influence the development of options coming out of the method. In addition, workshops were held with the full SEERAWP to discuss progress and findings from the study, and a sub-group of the three statutory agencies met to input to the SA and HRA being undertaken alongside development of the apportionment options.

Weaknesses

- 5.9 The basic method is relatively simple, however, collation and analysis of the datasets for each criterion is more complex. The methodology has some

¹¹ Primary Aggregates Sub-regional Apportionment in South East England. Final Report. Prepared for SEERA by Land Use Consultants, November 2007

current data limitations, but could still be applied. The main limitation was that the volume and viability of geological resource could not easily be calculated. The BGS data on layers of soft sand, sharp sand and crushed (hard) rock were considered by the Steering Group to have limitations as they did not show local differences such as less workable areas of mineral resource. There was discussion that the BGS geological data should be supplemented with locally based evidence and liaison with individual MPAs. However, it was agreed that while this may be possible in some cases, comprehensive and consistent supplementary data for the entire region was not available.

Table 5.1: Summary of strengths and weaknesses of the South East sub-regional apportionment methodology

South East	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

LONDON

Strengths

- 5.10 The methodology used quantitative analysis of data on the available resource (supplied by the industry), with an element of qualitative analysis by the MPAs and LAWP. Use of this data and the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction allow the methodology to be replicated relatively easily.
- 5.11 The sub-regional apportionment is provided to MPAs and it's development involved representatives of a number of key stakeholders: MPAs, the Greater London Authority, industry and the Crown Estate.

Weaknesses

- 5.12 The apportionment method considered only one apportionment option, however, the London region is unique in that the constrained nature of the remaining resource in the region restricts the potential for alternative spatial options to be considered. The current apportionment is based on the location of the viable resource in the London region, the basis for which is the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction.
- 5.13 An explanation of the qualitative analysis undertaken is not available in a written document and as a result the method followed and judgements made

are not always clear or fully justified. This also makes the evaluation of the range of environmental issues incorporated into the methodology uncertain.

Table 5.2: Summary of strengths and weaknesses of the London sub-regional apportionment methodology

London	
A Range of environmental issues incorporated	?
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

EAST OF ENGLAND

Strengths

- 5.14 The method followed and judgements made are explicit and based on best available evidence. The method involves undertaking quantitative analysis where data are available. Quantitative analysis of past sales (the average over the last 10 years) was undertaken and used to calculate the revised sub-regional apportionment.
- 5.15 The methodology relies on the provision of sales data by industry. This information is collated by the RAWP annually to inform the annual monitoring reports and so is readily available.
- 5.16 The analysis behind the methodology is simple and could be replicated easily requiring limited technical expertise. The sub-regional apportionment is divided between individual MPAs and groups of MPAs.
- 5.17 The stakeholders involved were those from the RAWP – this comprised a mix of MPAs, Industry, the Minerals Planning Association, British Aggregates Association, the South East and London RAWPs, EERA, the Environment Agency (EA) and government representatives (GO East, DCLG).

Weaknesses

- 5.18 The EERAWP agreed that the sub-regional apportionment should be based on historical data, specifically an average of sales over the last 10 years. Only one option was considered and environmental issues do not appear to have been addressed in the apportionment process.
- 5.19 Whilst the RAWP annual monitoring report itself is readily available, some data may not be available, due to confidentiality issues.
- 5.20 Key stakeholders not involved were the other statutory environmental organisations (English Heritage and Natural England).

Table 5.3: Summary of strengths and weaknesses of the East of England sub-regional apportionment methodology

East of England	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

SOUTH WEST

Strengths

- 5.21 Several environmental constraints were considered in developing an ‘environmental’ scenario (SSSIs, SACs, SPAs, Ramsar Sites, AONBs, NNRs, Scheduled Ancient Monuments, Registered Battlefields, World Heritage Sites, Heritage Coast, National Parks, Registered Parks and Gardens, and Groundwater Source Protection Zone 1). In addition, high level environmental issues were taken into account during the development of a ‘status quo’ scenario, for example, the availability of unconstrained resources within shortfall areas. If developed fully, a third scenario based on meeting the needs of the market would have taken air pollution and climatic factors into account indirectly, by reducing the transport distances where possible.
- 5.22 Three scenarios were attempted to be developed based on the extremes of different considerations – past patterns of supply, environmental considerations and market demand (although the third, market demand, was unable to be developed due to data limitations and difficulties with defining the scenario). The use of these extremes was intended to inform a decision on the desirability (or otherwise) of moving away from the existing apportionment approach.
- 5.23 The method followed and judgements made are explicit and based on best available evidence. The method involved undertaking quantitative analysis where data were available. Detailed calculations were used to establish the ability of each resource block to meet the South West regional apportionment. GIS overlays were then used to establish whether the shortfalls identified could be met under each Scenario, for example, to establish the extent of the resource located outside the selected environmentally sensitive areas.
- 5.24 The methodology has some current data limitations, but could still be applied. The location of the resource blocks is based on geological data provided by the BGS, with a degree of interpretation and assumptions regarding the quality of the resource. Information on permitted reserves was provided by industry and environmental designations are readily available datasets.

- 5.25 Scenario development was based on an excel spreadsheet drawing on a number of information sources, followed by a GIS mapping exercise for the purpose of Scenario 2. The calculations are explained in detail, together with reasoning and data sources, and therefore could be replicated relatively easily.
- 5.26 Outputs were based on 'resource blocks' which were identified by grouping existing mineral workings. These were then related to geological units in the BGS mapping information provided. Discussion of the ability of resource blocks with a shortfall of permitted reserves to meet their apportionment was undertaken at the site level in some instances which helped to add certainty.
- 5.27 South West Councils (SWC) convened the Minerals Review Group to input into the project. The Group included a full range of representatives from MPAs, industry, environmental groups and statutory bodies.

Weaknesses

- 5.28 Development of the 'environmental scenario' did not consider issues such as population and human health, soils, air pollution and climatic factors, with no clear justification for this.
- 5.29 As described in **Section 3**, the apportionment process itself was undertaken on the basis of the percentage contribution of each resource block to the regional production of crushed rock and sand & gravel. This identified areas facing a shortfall in permitted reserves. Such shortfalls were then investigated to establish whether, under each Scenario, there would be difficulties of finding new permitted reserves to meet the shortfall requirements. As scenarios were based on extremes, some factors were not considered within them e.g. the environmental scenario did not take account of current patterns of extraction or areas of demand in identifying whether the shortfalls could be met.
- 5.30 The geological mapping used does not provide any guarantee regarding the quality or thickness of the resources. Nor does it purport to show the economic viability or environmental acceptability of working the resources. In some areas, where the BGS resource maps were found to exclude formations which are known to have been exploited for aggregates, either now or in the past, additional digital mapping information was obtained by SWC from the BGS.
- 5.31 Basing the outputs on resource blocks could also be seen as a weakness. Site specific detail may not be appropriate at the regional level and resource blocks generally crossed more than one MPA boundary, meaning that the apportionment by resource block needs to be re-calculated back to show how much each MPA would have to provide.

Table 5.4: Summary of strengths and weaknesses of the South West sub-regional apportionment methodology

South West	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C System used for generation/creation of options (e.g. scoring, weighting, GIS overlays, traffic lights)	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

EAST MIDLANDS

Strengths

- 5.32 The methodology takes into account some environmental issues that are considered to be key issues for the region. These include the implications of exports from the region to South Yorkshire in terms of carbon emissions, the effects of crushed rock extraction within and transporting additional aggregate across the Peak District National Park, and consideration of the general burden of increased sand and gravel extraction in Nottinghamshire.
- 5.33 Parts of the methodology are based largely on qualitative analysis. Modifications to the baseline apportionment scenario are quantified by applying a nominal percentage increase or decrease for different MPAs, based on a particular policy or issue considered. Although there is no clear consideration of different factors side-by-side to inform the development of options, the process followed and judgements made are clearly documented in the EMAWP Report, increasing the transparency of the method followed.
- 5.34 Data used within the methodology is readily available and includes information on past production, the extent of landbanks, permitted reserves and geological resources. The methodology is based on a mix of quantitative and qualitative analysis. It is generally easy to use and the calculations can be easily replicated with limited technical expertise required. Outputs are based on MPA boundaries.
- 5.35 The methodology was developed and applied by EMAWP members comprising a mix of interests including MPAs, industry representatives and central and regional Government representatives.

Weaknesses

- 5.36 There appear to be some gaps or partial consideration of certain environmental issues, including:
- Biodiversity, flora and fauna;
 - Human health;
 - Soil;

- Water;
 - Air;
 - Material assets;
 - Cultural heritage.
- 5.37 It may be that these environmental issues were considered, or were not considered relevant at the sub-regional scale; however this is not explicit in the EMAWP report.
- 5.38 The executive summary states that EMAWP do not have the capacity or remit to conduct a SA/SEA but that this will be taken into account when the SA of the Partial Review the Regional Spatial Strategy is conducted. The summary also highlights the limitations of the National Apportionment system in that it does not reflect sustainability criteria such as application of the proximity principle or sourcing from zones (ie on an interregional level) where least environmental impact is encountered.
- 5.39 The methodology is grounded in a single baseline sub-regional apportionment option calculated on the basis of production over the past seven years. The iterative process allows for reductions or increases to be made by MPAs based on a number of policy considerations and other issues, but these are not clearly presented as alternative options.
- 5.40 The extent to which environmental bodies were involved in the process is not clear.

Table 5.5: Summary of strengths and weaknesses of the East Midlands sub-regional apportionment methodology

East Midlands	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

WEST MIDLANDS

Strengths

- 5.41 International and national nature conservation, landscape and cultural heritage designations were included in the apportionment methodology, using GIS layers to calculate the area of 'unconstrained' resource outside of these designations.
- 5.42 Reasoned justification was provided as to why other environmental factors were not included:

- Floodrisk zones - this type of development (i.e. primary aggregate extraction) is considered 'water compatible' in PPS25 - the nature of sand and gravel resource means that it is mainly going to be found in floodplains.
- Conservation areas – Data was unlikely to be consistently available across the region and these areas are most likely to be within urban areas, which are considered as 'sterilised' with respect to available mineral resources.
- Agricultural Land Grade I - The best and most versatile agricultural land may be in areas where there is underlying aggregate. It is possible to restore land to Grade I standard following extraction.
- Green Belt – mineral extraction is an acceptable use in the Green Belt.
- Local nature conservation and landscape designations – Inclusion of local level designations was not considered appropriate at the regional level due to the strategic nature of the sub-regional apportionment. It would also be difficult to obtain GIS data for these designations.
- Ancient woodland - Based on PPS9, most ancient woodland should already have been designated under national SSSI designations. If there are areas that are not designated as SSSI, the assumption is that these will be local designations, and therefore they were not included.

5.43 The Steering Group agreed that sustainable transport should be omitted as a factor in the sub-regional apportionment. This was because it was considered misleading to assume that just because a mineral resource is near to a particular transport mode or transshipment point, it could easily be transported using that mode of transport – capacity and feasibility are also important considerations.

5.44 The methodology considered a range of options, based on:

- Options for continuing existing trends in extraction;
- Options for substituting primary aggregate;
- Supply-led;
- Growth-led;
- Environment-led;
- Equal weighting;
- Demand and resource;

5.45 In addition two basic options based on historic sales were generated:

- Past sales-led;
- Past sales led but with phasing.

5.46 The method followed and judgements made are explicit and based on the best available evidence. The apportionment options were generated using quantitative and spatial (GIS) data to quantify the different factors agreed to influence the apportionment. Each dataset had its own complexities, but could be obtained from readily available data sources for the most part (except the BGS geological data).

- 5.47 The basic method is relatively simple, however, collation and analysis of the datasets for each criterion is more complex. Despite this, with the necessary expertise and software, and following the method described in detail in the Final Report, the method could be replicated relatively easily. The apportionment options were produced by the MPAs, and no site-specific analysis was carried out.
- 5.48 An iterative process was undertaken for developing and appraising options. This involved a Steering Group consisting of representatives from the West Midlands Regional Assembly and the WMRAWP Technical Secretariat, as well as meetings with representatives of the MPAs, and meetings with the full WMRAWP to which statutory environmental bodies were also invited.

Weaknesses

- 5.49 The main limitation in data was the distribution, volume and viability of geological resource in the region. The best available data at the regional scale was the DiGMapGB-100 Mineral Resource dataset at 1:50 000 from the British Geological Survey (BGS). However, there is some evidence that there are gaps in the BGS data (e.g. incomplete coverage of the Shropshire 'fault line' and SW Herefordshire). Some MPAs have undertaken further work with the BGS to map their resource more accurately, but there is not complete coverage for the Region. In addition, there is no 'off the shelf' data on the depth or quantity of the resource.
- 5.50 An attempt was made to include 'proximity to markets' in the method, by applying a buffer distance to major urban areas to approximate the viable transport distance, as these settlements are likely to generate most of the demand for aggregates. These buffers covered almost the entire Region and it was decided therefore that introducing this further constraint to the resource data would not have a significant effect on the resulting apportionment options.
- 5.51 An attempt was also made to include a restriction to the estimated volume of available resource to the areas of resource within each MPA sub-region which are/have:
- Existing extraction permissions;
 - Allocated sites in development plans; and
 - Preferred areas or potential sites preferred by developers in emerging Mineral Development Plan Documents.
- 5.52 It was not possible to obtain GIS data and location of all of these sites for the Region in the timescale of the project, and from the data that was obtained from the MPAs, it was decided that this would limit the resource data to too large an extent.
- 5.53 The apportionment method requires technical expertise and software in relation to numerical data analysis using Excel, and spatial data analysis using Geographical Information Systems.

Table 5.6: Summary of strengths and weaknesses of the West Midlands sub-regional apportionment methodology

West Midlands	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

YORKSHIRE AND HUMBER

Strengths

- 5.54 A range of environmental issues was incorporated into the methodology for the apportionment of sand and gravel:
- Effect on International and National Nature Conservation Designations – Ramsar sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and National Nature Reserves;
 - Effect on designated Heritage Assets – Listed Buildings, World Heritage Sites, Registered Parks and Gardens, Scheduled Ancient Monuments and Historic Battlefields;
 - Effect on National Landscape Designations – Areas of Outstanding Natural Beauty, National Parks and Heritage Coasts;
- 5.55 Other issues considered but not included in the methodology were clearly justified as follows:
- Green Belt – although Green Belt is a nationally significant designation, national planning guidance makes it clear that minerals development need not be inappropriate development nor conflict with the purposes of designating Green Belts, provided that high environmental standards are maintained and that sites are well restored.
 - Flood risk – there is flexibility in the application of the sequential test for gravel workings which are considered to be ‘water compatible development’.
 - Risk of bird strike within civic aviation – ODPM / DfT Circular 01/2003 establishes a 13km consultation zone around civic airports. The 13 km consultation zone does not rule out gravel working, but the Civil Aviation Authority would be concerned if the activity or afteruse (especially if it involved landfilling) would attract birds or alter bird flight routes, thus increasing the risk of bird strike.
 - Nature conservation, landscapes and heritage features of local importance – local planning processes are appropriate for determining the siting of minerals development in relation to these aspects of local importance,

and standards of mitigation required e.g. buffer zones around important habitats.

- Sustainable transport – it was not possible to develop a criterion that measures transport mode (rail and water, rather than road). Measuring the density of provision of railheads and aggregate wharves does not necessarily correspond to the capacity of the transport network to facilitate the movement of sand and gravel – this would require detailed information on the current and future capacity of the network and potential for expansion, information that was not available to the study.
- Existing contracts and patterns of movement – such a criterion would be useful for reality checking any conclusions reached with respect to transport. However, it was anticipated that the necessary data would be very difficult to obtain, both in terms of availability and commercial sensitivity. Contractual information was also likely to be less significant than for waste management, for example, where contracts tend to be longer term.

5.56 Other issues such as transport distances and effect on the population were considered within the second part of the methodology – the SA of options.

5.57 The basic method is relatively simple, however, collation and analysis of the datasets for each criterion is more complex. Despite this, with the necessary expertise and software, and following the method described in detail in the Final Report, the method could be replicated relatively easily.

5.58 A series of options were developed in consultation with stakeholders. These were developed by weighting criteria related to supply, demand and environmental considerations. The following five options were put forward for appraisal:

- Option A - represents 'business as usual' in that it assumes that the current apportionment will continue into the future. The current apportionment has in the past been calculated upon historic sales figures, using the data and detailed knowledge held by RAWP members.
- Option B - places greater importance on the natural and built environment especially in international and national protected environments..
- Option C - gives greatest weight to the unsterilised resource and past use (sales).
- Option D - seeks a relatively even balance between protecting environmental assets and recognising drivers for growth in requirements for aggregate, and the benefits in principle of locating sources of supply relatively close to sources of demand.
- Option E - assumes that the issue of overriding importance is the need to reduce transport distance and therefore gives substantial weight to the location of the existing population and the effects of future growth.

5.59 The method followed and judgements made are explicit and based on best available evidence. Options were developed by agreeing a list of criteria related to supply, demand and environmental considerations. The most

appropriate data set for each criterion was used to develop a percentage split between mineral planning sub-regions. Despite some current data limitations, the method could still be applied. Outputs for this region were at a sub-regional scale – mineral planning sub-regions which are groupings of MPAs, but the methodology could also be applied at MPA level.

- 5.60 The apportionment method requires technical expertise in mineral planning and data analysis and interpretation, but is easy to use and can be easily replicated.
- 5.61 The methodology was developed by consultants in collaboration with the regional RAWP and a wider group of stakeholders, including environmental bodies such as Natural England. Options were put forward by stakeholders by stating the level of importance they felt should be attached to different criteria. The results were also discussed with a group of industry representatives.

Weaknesses

- 5.62 As opposed to the methodology applied to the apportionment of sand and gravel which considered a range of environmental factors, the methodology for crushed rock was based a single option using historic sales.
- 5.63 The apportionment method for sand and gravel requires technical expertise and software in relation to numerical data analysis using Excel, and spatial data analysis using Geographical Information Systems.
- 5.64 The main data limitations for the sand and gravel apportionment were:
- Lack of data on the quantity of unsterilised resource available i.e. it was possible to calculate the land area available, but knowledge on the depth and quality of resource was variable across the region. This had a major effect on whether options could be considered to be reasonable and sustainable, and further work was undertaken to share industry knowledge on resources and improve the robustness of the research findings;
 - It proved not to be possible to develop a criterion that measures transport mode (rail and water, rather than road). Measuring the density of provision of railheads and aggregate wharves does not necessarily correspond to the capacity of the transport network to facilitate the movement of sand and gravel – this would require detailed information on the current and future capacity of the network and potential for expansion, information that was not available to the study;
 - Existing contracts and patterns of movement – such a criterion would be useful for reality checking any conclusions reached with respect to transport. However, it is anticipated that the necessary data would be very difficult to obtain, both in terms of availability and commercial sensitivity. Contractual information is also likely to be less significant than for waste management, for example, where contracts tend to be longer term.

Table 5.7: Summary of strengths and weaknesses of the Yorkshire and Humber sub-regional apportionment methodology

Yorkshire and Humber	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

NORTH EAST

Strengths

- 5.65 Scenario 3, by consideration of the demand for aggregates in the region, aimed to minimise the transport of materials from source to the markets thereby considering environmental issues such as air quality and climate change. Scenario 4, developed to reflect local issues raised by the Steering Group during reviews of Scenarios 1, 2 and 3, took some environmental issues into account on an ad hoc basis, dependent upon the comments received.
- 5.66 Alternative spatial options were considered, based on past production, potential resources and the market demand.
- 5.67 Development of Scenarios 1 and 2 were undertaken based on quantitative data where available, including past production and existing permitted reserves. Although quantitative data was used as the starting point for Scenarios 3 and 4, they were further developed using qualitative data regarding market demand and local issues.
- 5.68 The majority of the data used in the development of the options is readily available through the RAWP report or consultation with MPAs and industry. Issues regarding company confidentiality and estimates of permitted reserves led to some limitations regarding the data available for the development of Scenario 2. Once the data from RAWP reports, MPAs and industry are collated, the method used to produce each apportionment Scenario is straightforward and requiring limited technical expertise.
- 5.69 NERAWP includes representatives of the constituent MPAs, central government departments and the aggregates industry. The apportionment scenarios are based on four identified sub-regions: Durham, Northumberland, Tees Valley and Tyne and Wear.

Weaknesses

- 5.70 Although the scenarios were subject to a detailed environmental appraisal to identify their suitability in terms of environmental, social and economic

impacts, the development of the scenarios themselves took few environmental considerations into account.

- 5.71 Additional reasonable alternatives could have been considered such as avoidance of sensitive environmental receptors or maximising the use of sustainable transport modes such as rail and water.
- 5.72 Geological data was not utilised for the scenarios and the scenarios were not developed using a system such as scoring, weighting or GIS overlays, which reduces transparency of the approach.

Table 5.8: Summary of strengths and weaknesses of the North East sub-regional apportionment methodology

North East	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

NORTH WEST

Strengths

- 5.73 The RAWP considered different options for methodologies for the sub-regional apportionment through an iterative process. These were based on variations of past production or a continuation of the previous sub-regional apportionment split, which would lead to varying spatial distributions.
- 5.74 The methodology used (and the alternatives considered) is based on the quantitative analysis of past production figures. The process followed and judgements made are explicit and based on best available evidence.
- 5.75 The analysis behind the methodology is simple requiring limited technical expertise. Outputs are available by MPA or groups of MPAs.
- 5.76 The method relies on the provision of sales data by industry. This information is collated by the RAWP annually to feed into the annual monitoring reports and so is readily available.
- 5.77 Membership of NWRAWP is drawn from a mix of the constituent MPAs, central government departments and representatives from the aggregates industry. In addition, the North Wales RAWP is represented.

Weaknesses

- 5.78 All options considered were based on variations of past production or a continuation of the previous sub-regional apportionment split and as a result

there were several gaps or very partial consideration of environmental issues and no clear justification for this.

- 5.79 It is likely that there are reasonable alternative apportionment options that were not considered. For example, those taking account of designated nature conservation sites or proximity to areas of demand.
- 5.80 Whilst the annual monitoring report itself is readily available, some data may not be available, due to confidentiality issues.
- 5.81 The key stakeholders not represented are the statutory environmental organisations: the Environment Agency, Natural England and English Heritage.

Table 5.9: Summary of strengths and weaknesses of the North West sub-regional apportionment methodology

North West	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

NORTH AND SOUTH WALES

Strengths

- 5.82 A key feature shaping the apportionment methodology in Wales has been the proximity principle: reducing the distances over which aggregate minerals need to be transported. A deliberate attempt was made to align quarrying location to the distribution of population, the intention being to reduce greenhouse gas emissions and air pollution from transport.
- 5.83 All the other environmental issues accommodated were within a Wales-wide environmental capacity study. This was particularly impressive in treating key wildlife constraints (SPAs, SACs and Ramsar sites) and National Trust controlled land and World Heritage Sites as absolute restrictions on aggregates working if they dominated a 1km grid square.
- 5.84 All other listed constraints were incorporated with the following exceptions:
 - Flood risk was not specifically covered, though proximity to water courses was;
 - Impact on groundwater reserves addressed the main aspect of effect on water quality;
 - Effect on Green Belt was not covered as there are no Green Belts in Wales;

- Safeguarding around aerodromes was not considered, probably being a minor issue.
- 5.85 The environmental capacity approach drew attention to the relative merits or difficulties of aggregates working everywhere, and to that extent environmental options were presented for consideration.
- 5.86 The methodology started from a sustainability perspective, so options such as considering a demand-led (minimum cost) pattern of supply or a pattern based on retaining historic distributions of quarries were not presented. The proximity principle would, though, indirectly afford some support to a demand-led supply pattern. However, underpinned by geological information on workable resources of aggregates-bearing resources, the method did allow any particular geological formation (out of eleven groups) to be selected and the environmental capacity of the areas covered to be identified. In this way the environmental capacity approach proactively identified resources where extraction may be possible, rather than concentrating solely on constraining factors and where extraction can not be undertaken.
- 5.87 The environmental capacity method is transparent and uses GIS-based tool. GIS data is used to generate a ‘traffic light’ system of assessment, with thresholds selecting the boundaries between the red, orange and green lights. These thresholds can be changed, and a weighting system can be used to vary the initial assumption that all 12 environmental topics (or groups of topics) have equal weight. Although these are not strictly options – rather they produce gradations along a continuum of environmental capacity – they can be manipulated to examine the effect of changes in assumptions.
- 5.88 The method uses the best data available to identify geological formations of potential interest for mineral working. This is supplied by BGS. Although some problems were identified in relatively remote areas, ongoing mapping work and improvements to the database over time suggest that this is a matter of continual refinement rather than the data being insufficient to sustain the method. Apart from geological information, other data were available or could be obtained and entered into the GIS system.
- 5.89 The GIS tool is reasonably easy to use. A ‘GIS querying tool’ has been developed to accompany the data: this has been designed so that the user does not need to have extensive GIS computing skills (basic knowledge of ArcView only). It can be run on a computer provided ArcView 9 is installed, even if it does not have Microsoft Access installed. It is also easily updated when new information becomes available, and is compatible with other WAG GIS applications.)
- 5.90 Output information is provided on 1km squares through the environmental capacity study. Output information can also be at the scale of the individual geological resource block. Information on population distribution is at the local authority level.

Weaknesses

- 5.91 The main likely effects of working in different areas was studied, but not through the vehicle of a review of options.

- 5.92 The GIS tool requires considerable data across numerous environmental topics and so the environmental capacity study is data-heavy.
- 5.93 The methodology has limitations on its use in local development plan making and especially in development control, due to the geographical scale at which it applies.
- 5.94 The environmental capacity tool had some stakeholder participation in its creation, but hardly any in its application. However, use of the tool is a political process that can in principle be made as open as the decision-maker desires. In reality, that engagement was very limited. Likewise, the assessment of the proximity principle has been treated as a technical exercise. The principal opportunity for stakeholder engagement will be when the RTS advice is taken forward into Local Development Plan preparation, though arguably that will be at too late a stage to influence the apportionment method in a meaningful way.

Table 5.10: Summary of strengths and weaknesses of the North and South Wales sub-regional apportionment methodology

North and South Wales	
A Range of environmental issues incorporated	
B Degree to which reasonable alternative spatial options are considered	
C Transparency of approach	
D Data and technical requirements (including level of definition of geological data required)	
E Level of spatial definition of outputs	
F Extent of stakeholder engagement	

SUMMARY OF REVIEW FINDINGS

Summary of strengths and weaknesses

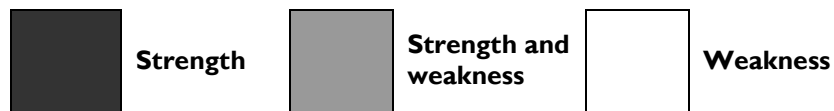
- 5.95 Strengths and weakness of the sub-regional apportionment methodologies in terms of the six review criteria are summarised below and shown graphically in **Table 5.11**.
- 5.96 **Environmental issues** were most comprehensively incorporated into apportionment methodologies adopted in South East, West Midlands and North/South Wales, with only partial consideration in the East of England, East Midlands, North East and North West Regions. However, it is recognised that environmental issues may have been more fully considered in these regions through RAWP meetings etc, but documentation of the process is not readily available.
- 5.97 A similar picture exists in relation to the **consideration of spatial options**, with Yorkshire and Humber Region also considering a full set of reasonable alternatives.
- 5.98 Seven of the ten regions were **explicit about judgements made** within the methodologies adopted, and drew on the best available evidence.

Methodologies adopted for London, East Midlands and the North East Region are **less transparent**. Again, it is acknowledged that appropriate documentation of the process may not have been obtained, as it may only be available within minutes of meetings etc.

- 5.99 None of the methodologies is considered to be technically complex, but most **require some technical expertise** and have some data limitations. These tend to be those regions that have incorporated a full range of environmental considerations and alternative options.
- 5.100 The **level of spatial definition** of outputs is based on MPA boundaries for the majority of regions, but based on geological 'resource blocks' for the South West and North/South Wales.
- 5.101 **Key stakeholders** have been involved in the apportionment process for most regions, with a full range of interests involved in the South East, South West, West Midlands and Yorkshire and Humber Regions. Some stakeholders were involved in the creation of the North/South Wales environmental capacity tool, but there was very limited engagement in the application of the tool.
- 5.102 As noted in **Section 3** of the report, the MASS combines 'top-down' *Guidelines* with a 'bottom-up' RAWP process. The 'bottom-up' influence ensures that as well as reflecting past patterns of supply and demand, the ensuing apportionments also mirror extant planning and environmental constraints. One of the acknowledged strengths of the RAWP process has been the interaction between the industry and MPAs, such that outcomes (ie apportionments) reflect local circumstances. The presence of extant designations is clearly an important component of this. It is also true to say that past patterns of supply inherently reflect these designations too, insofar as, generally, planning permissions for mineral extraction will not have been granted in areas of recognised environmental importance.

Table 5.11: Summary of strengths and weaknesses of each sub-regional apportionment methodology

Key:



Evaluation criterion	Region (including N and S Wales)									
	South East	London	East of England	South West	East Midlands	West Midlands	Yorkshire and Humber	North East	North West	N and S Wales
A Range of environmental issues incorporated	Strength	Weakness	Weakness	Strength and weakness	Strength and weakness	Strength	Strength and weakness	Weakness	Weakness	Strength
B Consideration of reasonable alternative spatial options	Strength	Weakness	Weakness	Strength and weakness	Strength and weakness	Strength	Strength	Strength and weakness	Strength and weakness	Strength and weakness
C Transparency of approach	Strength	Strength and weakness	Strength	Strength	Strength	Strength	Strength	Strength and weakness	Strength	Strength
D Data and technical requirements	Strength and weakness	Strength and weakness	Strength	Strength and weakness	Strength	Strength and weakness	Strength and weakness	Strength	Strength	Strength and weakness
E Level of spatial definition of outputs	Strength	Strength	Strength	Strength and weakness	Strength	Strength	Strength	Strength	Strength	Strength and weakness
F Extent of stakeholder engagement	Strength	Strength and weakness	Strength and weakness	Strength	Strength and weakness	Strength	Strength	Strength and weakness	Strength and weakness	Weakness

6 Proposed Toolkit for Apportionment Methodology

- 6.1 This section introduces the proposed toolkit for developing an aggregate apportionment methodology that could be used to apportion the regional guideline figures between individual MPAs or groupings of MPAs. The proposed toolkit has been developed by drawing on the review of current apportionment methodologies and other research documented in Sections 2 to 5, together with stakeholder input. The components of the proposed toolkit are described in more detail in **Sections 7 to 10**.
- 6.2 While the proposed toolkit is aimed at apportionment exercises that will be undertaken by groupings of MPAs to apportion the current regional guideline figures, lessons could be learnt from this toolkit for the national level of allocation of aggregate provision to the regions. Although not a specific requirement of the brief, comments relating to the current process used to allocate the national guideline figures for aggregate provision to the regions are provided in **Section 11**.
- 6.3 We are grateful to representatives of MPAs, industry, the statutory environmental bodies and NGOs for participating in a project workshop in January 2011. Their input helped guide the development of the proposed toolkit for aggregates apportionment methodology. A list of participants is included in **Appendix I**.

ONE SIZE DOES NOT FIT ALL

- 6.4 It is not considered appropriate to put forward a single, prescriptive methodology for the apportionment of land-based aggregate extraction. It is evident from the various approaches used to apportion aggregates in different parts of the country that they reflect particular local circumstances – geology, past patterns of supply, the composition of Aggregate Working Parties, etc. Thus any attempt to prescribe a fixed methodology to be used whatever the circumstances would neither be practicable nor desirable.
- 6.5 Instead, a ‘toolkit’ comprising three key **components** has been proposed for MPAs to draw on when developing their own method for apportioning aggregate provision between their relevant MPAs. Any apportionment methodology should also display a number of **characteristics** if it is to be judged robust.
- 6.6 Assuming that the Managed Aggregates Supply System continues, there will still be some form of national guideline figure broken down into smaller spatial units. The apportionment of aggregate production to individual MPAs will be the responsibility of Aggregate Working Parties (AWP), although these may no longer be the regional groupings used to date due to the abolition of the regional tier of planning, and the exact make up and grouping of AWP will be down to local level decisions and agreement. The proposed toolkit has therefore been designed to apply whatever the local spatial planning unit and make up of AWP. This could include a ‘resource block’ approach to apportionment. For example, the Thames Valley Gravels are an

important resource that stretches from Gloucestershire and Wiltshire, through Oxfordshire, Berkshire, Buckinghamshire and Surrey. It may be appropriate for these MPAs to form a Thames Valley Gravels AWP and generate an apportionment of this mineral resource for each MPA. **Figure 6.1** illustrates where the toolkit and this level of apportionment methodology sits within the overall mineral planning process.

Key components of proposed toolkit for developing an apportionment methodology

6.7 There are three components of the toolkit, which are considered to be key in determining an apportionment:

- **Local demand**
- **Local supply**, including past sales
- **Environmental issues**

6.8 Each component is described in **Sections 7 to 9** respectively, with examples of how the component can be characterised and used drawn from existing apportionment methodologies (reviewed in **Section 5**).

Key characteristics of any apportionment methodology

6.9 It is also considered important that any apportionment methodology developed should display the following characteristics:

- **Transparency of approach** (i.e. it should be possible for all stakeholders to see and understand the data inputs, assumptions made and outputs).
- **Data and technical inputs** to be as robust as possible without requiring excessive cost of new data provision.
- **Level of spatial definition** (i.e. it should be possible for all stakeholders to identify the planning unit to which a local apportionment applies).
- **Extent of stakeholder involvement** (i.e. there should be adequate stakeholder input to the apportionment process).
- **Consideration of alternatives** (i.e. realistic and achievable alternatives at each stage of the apportionment methodology should be considered).

6.10 These characteristics are described in more detail below.

6.11 The output from the apportionment methodology should be a set of alternative apportionments divided between the relevant planning unit(s), which can form the basis of public consultation, leading to the choice of a preferred strategy for inclusion in the relevant development plan(s). The formulation of alternative apportionment options is dealt with in more detail in **Section 10**.

LOCAL ASSESSMENT OF DEMAND

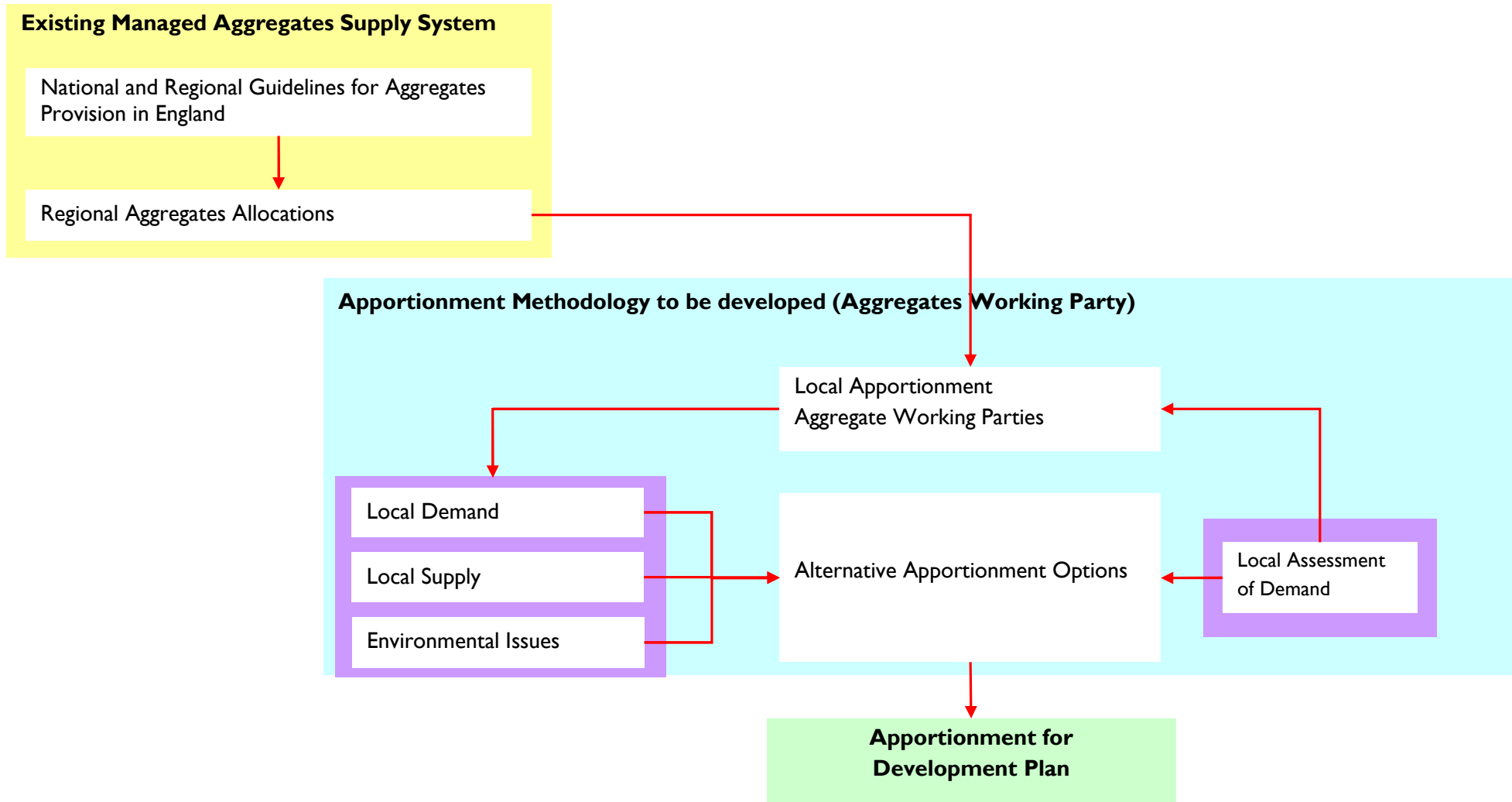
- 6.12 The inclusion of local assessment of demand within **Figure 6.1** in part reflects the recent advice from the Department of Communities and Local Government in the letter to Chief Planning Officers dated 6th July 2010 which states:

“Mineral planning authorities will have responsibility for continuing to plan for a steady and adequate supply of aggregate minerals to support economic growth. They should do this within the longstanding arrangements for mineral planning. Technical advice provided by the Aggregate Working Parties, including their current work in sub-apportioning the DCLG guidelines for 2005-2020 to planning authority level will assist with this....

Planning authorities can choose to use alternative figures for their planning purposes if they have new or different information and a robust evidence base. We will work with the minerals industry and local government to agree how mineral planning arrangements should operate in the longer term”.

- 6.13 Thus it is open for individual MPAs, or groups of MPAs, to formulate alternative local demand figures. On this basis, it is possible to envisage a situation where a number of MPAs complete a local exercise, the culmination of which results in a different figure to that generated by the National Guidelines and apportioned via the longstanding arrangements for mineral planning. It will obviously be for the relevant AWP to reconcile any differences in demand figures such that the objective of planning for a steady and adequate supply of aggregate minerals to support economic growth is not compromised.
- 6.14 Oxfordshire County Council has recently commissioned an assessment of local demand and supply within the County. The results of this work are still emerging, but the initial conclusions shared at the project workshop in January 2011 are that it is quite a complex process, with many data limitations and assumptions needing to be made. Studies of this sort provide a useful example of how to go about assessing local demand.

Figure 6.1: Relationship between the apportionment methodology covered by this toolkit and the overall current mineral planning process



KEY CHARACTERISTICS OF AN APPORTIONMENT METHOD

Transparency of approach

- 6.15 Equally important as developing and implementing a robust apportionment methodology is documenting the steps taken and decisions made. By ensuring that the approach taken is reported in full so that the process can be repeated if necessary, the approach used will be transparent and accessible to peer review and comment, and at Examination.
- 6.16 As a minimum, the following information should be clearly recorded and reported on alongside the results of the apportionment:
- A description of the overall methodology followed.
 - The range of alternative options considered at each stage.
 - Key assumptions made e.g. those underlying demand projections.
 - Key decisions made during the process e.g. options or issues discounted, and the reasons for these.
 - Data sources used and data limitations.

For example...

The apportionment methodology followed in the South West used detailed calculations to establish the ability of each resource block (a spatial unit based on geology rather than MPA boundaries) to meet the South West regional apportionment. GIS overlays were then used to establish whether the shortfalls identified could be met under each of the three scenarios being tested, for example, to establish the extent of the resource located outside the selected environmentally sensitive areas.

The report documenting the process followed in the South West clearly explains the calculations undertaken in detail and judgements made, together with reasoning and data sources.

Data and technical inputs

- 6.17 The review of existing apportionment methodologies showed that data availability, accuracy and complexity are important influencing factors in the topics considered in an apportionment methodology. The apportionment will only be as good as the data that underpins it. However, equally the data used should be accessible and not require lengthy technical input to enable its use, nor be prohibitively expensive.
- 6.18 In developing an apportionment methodology, the AWP's need to be pragmatic, using the best data available given cost and resourcing issues. As described above, where there are limitations with the data used these should be fully documented.
- 6.19 One of the most important yet debated data inputs to an apportionment methodology is geological information. In the past, MPAs had to utilise and

interpret traditional geological maps in order to assess the location and extent of lithologies that comprise a mineral resource in order to inform planning policy. Recognising a need for more accessible and specific data, the British Geological Survey was commissioned in 1996 by the Office of the Deputy Prime Minister (now Department for Communities and Local Government) to produce a series of 'county' mineral resource maps.

- 6.20 The resource maps have proved useful, although they have some limitations for the purposes of planning resulting from the scale of mapping used. For example, large areas of sandstone may contain geological units that are suitable for high specification aggregate (high PSV). However, due to the nature and scale of the mapping, whilst these units are known to exist they are not individually differentiated in the data. Therefore, an MPA may want to have specific safeguarding policies for the high PSV units but are unable to actually delineate these units on a Proposals Map. Further work, at a larger scale, would be required in order to better differentiate the high PSV units.
- 6.21 Where the nature or scale of the BGS data is queried, MPAs and industry representatives within the local spatial planning unit covered by the AWP should use their knowledge to supplement available mineral resource data as required.

South Midlands Growth Area

There are examples where further information has been sought to aid the aggregates apportionment process. One such example is a project undertaken by the British Geological Survey and the National Stone Centre in the mid-2000s to research the demand for aggregates that would arise as a consequence of the increase in construction activity in the South Midlands Growth Area. This then informed the preparation and monitoring of the sub-regional apportionment of the 2001 to 2016 National and Regional Guidelines for Aggregates Provision.

Level of spatial definition

- 6.22 Regardless of the geographical area covered by the apportionment methodology, it should be possible for all stakeholders to identify the local spatial planning unit to which the apportionment applies. In addition, the apportionment methodology should avoid considering individual aggregate extraction sites to ensure that it remains a strategic exercise and does not duplicate the function of individual Minerals Development Frameworks.
- 6.23 Given the new flexibility provided by the Government's plan to revoke Regional Spatial Strategies, it may be appropriate for geological resources to influence the groups of MPAs that form the AWPs, as in the Thames Valley Gravels example described earlier in this section.
- 6.24 This approach may not be practicable everywhere and it could lead to a MPA being involved in more than one AWP; however it is an approach that could be explored. It should also be noted that the eventual output of the apportionment process should be an MPA-level apportionment to allow it to be transferred to and tested at the Minerals Development Framework level.

Extent of stakeholder engagement

- 6.25 Stakeholder involvement should not be confused with public consultation. There should be adequate stakeholder input to the apportionment process, through the use of a steering group or workshops. The role of stakeholders is to provide technical experience and local knowledge, help develop options and inform decision making regarding the final apportionment option.
- 6.26 Stakeholders should include, but are not limited to:
- Industry representatives.
 - Mineral Planning Authorities.
 - Statutory environmental bodies: Natural England, Environment Agency and English Heritage.
 - Non-governmental organisations eg RSPB, CPRE, Friends of the Earth, the Campaign for National Parks, CBI and other business representatives etc.

For example...

Representatives of statutory bodies and non-governmental organisations can bring important technical expertise to aid the apportionment process. For example, collaborative work on site restoration such as the Nature After Minerals Project, demonstrates the minerals expertise within bodies such as RSPB and Natural England, which can be utilised to help to make the aggregate apportionment process, and therefore its outcome, more sustainable.

- 6.27 The potential benefit of including technical stakeholders in the aggregate supply system and apportionment processes should be considered at all levels, including the National Coordinating Group for the regional aggregates working parties.
- 6.28 By contrast, public consultation should be undertaken on the apportionment options generated by the methodology or could be carried out to obtain views on the methodology itself. Where public consultation is undertaken as part of the Minerals Development Framework process at the MPA level, it will need to be undertaken in accordance with the relevant Statement of Community Involvement.

Consideration of alternatives

- 6.29 At all stages of the apportionment process, consideration should be given to realistic and achievable alternatives. The key words are however 'realistic' and 'achievable'; the process should not be lengthened by consideration of unreasonable alternatives.
- 6.30 Some alternatives will be discrete i.e. involving a choice between one option and another; whereas other alternatives can relate to options that can be combined in a number of different ways. The latter may occur if the AWP decide to use a scoring or weighting system within the apportionment methodology. In all cases, realistic and achievable alternatives should be explored, with justification provided for using the selected approach.

For example...

The North East RAWP identified three scenarios for the apportionment of aggregates in the region: one based on recent sales information, the second on potential resources and the third on potential resource plus market location. As a result of comments received from the project Steering Group, it was apparent that there were a number of local issues regarding sand and gravel that were not being picked up fully by the three scenarios. A fourth scenario for sand and gravel was therefore developed to give sufficient weight to all of the comments received. This process provided four alternatives for assessment and consideration.

7 Demand Component of Proposed Toolkit

Purpose of Inclusion in Proposed Toolkit for developing an Apportionment Methodology

Understanding the future demand for aggregates is important as it helps to establish how much primary aggregate will be needed to supply the construction industry and where building materials are likely to be required in large quantities in the future. Understanding where aggregates may be used can also help to influence distances over which aggregates may be transported from areas of supply.

INTRODUCTION

- 7.1 There is a need to understand likely levels and areas of demand for aggregates within a MPA or grouping of MPAs, in order to establish how much aggregate will be needed to supply future development required within and around the MPA. Understanding local demand for aggregate should also provide a reality check of the National and Regional Guidelines for Aggregates Provision in England.

ESTIMATING DEMAND

- 7.2 Local demand for aggregate is influenced by two main factors:
- ‘Latent demand’, i.e. the demand for aggregate arising from redevelopment of existing housing, schools, urban areas etc.
 - Future demand, i.e. future development pressure from construction of new housing, roads, commercial buildings etc required over a defined horizon. Demand for aggregate minerals also arises from industrial applications such as glass making and ceramics, but these are specialised uses and represent only a small share of total demand.
- 7.3 There is some debate within the minerals industry as to whether the demand for aggregates from the construction industry is greater from existing redevelopment and refurbishment (i.e. latent demand) or development associated with meeting future housing/infrastructure targets/needs (i.e. future demand). Indeed the ratio between latent demand and future demand may differ in different parts of England and Wales, and advice should be sought from the minerals industry within the relevant AWP for the spatial planning unit being addressed.

For example... North Wales Regional Technical Statement

The North Wales Regional Technical Statement (2009) states that “a significant proportion (30-40%) of all aggregates consumed are utilised in repair and maintenance work, thus effectively sustaining the existing built environment and infrastructure”.

- 7.4 The demand for primary aggregates is determined by the level of construction activity. Construction activity can be measured in investment

terms (gross domestic fixed capital formation) or output (gross value added, GVA). There are essentially two approaches to estimating long-term local demand for primary aggregates based on measures of construction activity:

- A 'top-down' approach based on the national construction forecast and a projection of the share accounted for by MPA, to which the historical national relationship with aggregates demand would be applied, with assumptions required about the MPA's future share of the national construction output.
- A 'bottom-up' approach based on the estimated physical output in a MPA in terms of the numbers of houses, industrial and commercial floorspace, length of new road building and maintenance etc, planned to take place in the MPA over the period and to which the known ratios of volumes of aggregates to units of output is applied. Assumptions about any likely design changes and implications of sustainable construction techniques would significantly affect the proportion of the demand met by secondary, recycled or primary aggregate.

7.5 Both approaches can be used and a view taken, depending on the difference in results, on the likely range in demand for aggregates over the period. The uncertainties in either approach over the forecast period are considerable – and any results could only be taken as providing an indicative measure of future demand. It is likely that both approaches would be based on existing and available secondary data.

7.6 Alternatively, a simpler approach might be to use population figures and/or housing projections for each MPA, as a proxy for estimating latent or future construction demand respectively.

7.7 All three of these approaches are described more fully below.

Top-down approach

7.8 Long-term forecasts in construction demand are used as the basis of the national aggregates demand forecast in the National and Regional Guidelines, applying the long-term (25 year) historical relationship between aggregates demand (million tonnes) and construction output (GVA in constant prices). This recognises that different sub-sectors of the construction industry have varying levels of demand for aggregates per thousand pounds of output. The top-down approach would also require these forecasts and historical relationship data to be available at the national level. In order to estimate the long-term demand at an MPA level, there is a need to apply the current ratio of construction output within the MPA to that in England and Wales. Therefore, the top-down approach requires technical understanding of economic forecasting, and may not be simple to achieve.

Bottom-up approach

7.9 The bottom-up approach would be based more on an understanding of construction requirements (i.e. volume of aggregates per development use), and is thus rather more of an engineering analysis than an economic analysis. This will be based on the long-term strategic development plan for the MPA

to estimate the likely level of physical construction output over the plan period.

- 7.10 The demand forecast would therefore be estimated using the known intensity of use of primary aggregates per unit output, applied to the MPA's development plan figures for future housing and economic development. The intensity of use could be calculated by comparing the national ONS data on the levels of demand of primary aggregates by different end-uses (house-building, etc) with MPA or district data on the number of houses built, floorspace completed, road lengths maintained etc, within that MPA over a similar time period to the ONS data. To avoid problems of lags in the two sets of data on an annual basis, it would be prudent to take a five year average when estimating the intensity of use per unit output. The intensity of use per unit of housing for example could then be applied to the development plan figures for future housing provision to estimate the tonnage of aggregates required to achieve that level of house building in the MPA over the time period. Estimates for aggregates required in road building and other developments could be done in the same way.
- 7.11 Variations in distribution of demand within the MPA could be analysed at a finer level of detail by estimating aggregate requirements in particular settlements across the MPA based on the housing provision figures for each settlement (including any strategic housing allocations, e.g. urban extensions on the edge of larger towns or cities). Therefore, within the MPA, the demand for aggregates is likely to be highest at the major towns and cities, and particularly where strategic housing allocations or major new infrastructure are planned.

Using population and housing projections as a proxy for demand

- 7.12 Existing population figures could be used as a proxy for estimating the latent demand within an MPA or spatial planning unit due to the close correlation between concentrations of people and development activity. In simple terms, the greater the number of people, the greater the rate of development as people extend their houses, new schools are built and urban land is redeveloped. A principal data source would be the Mid Year Population Estimates produced by the Office for National Statistics (and available on the ONS website), which can be disaggregated by MPA or relevant spatial unit.
- 7.13 Future development pressure could also be used as a proxy for estimating future construction demand. The planning system will guide development to certain strategic locations, leading to a demand for construction materials in those locations. Until 2010, this was done within Regional Spatial Strategies, thus housing projection figures could be obtained for each MPA, which took into account population and household projections and economic and employment forecasts. Housing projection figures are more likely to be prepared by individual planning authorities following the government's intention to abolish RSSs, and should therefore still be available for use in apportionment methodologies.

DEMAND SCENARIOS OR OPTIONS

- 7.14 With any forecasting exercise, there are likely to be different 'scenarios' used that result in different final demand figures. For example, if a combination of the top-down and the bottom-up approaches described above as well as using a combination of population and housing projections as a proxy to estimate future demand for aggregates within each MPA, it is likely that three different tonnages at the end date would be obtained for each MPA, thus there would be three forecast 'scenarios' to consider and choose between. If just one of those approaches was used on its own, the resulting aggregate tonnages at the end date could also be compared with any previous figure apportioned to those MPAs through the sub-regional apportionment processes undertaken by the RAWPs and Regional Assemblies on the current national and regional guidelines. In addition, if different assumptions are applied within the approaches, this would create more scenarios and therefore a range of different tonnages.
- 7.15 For example, within an MPA, the overall level of future housing provision being planned for might be a choice between a lower and a higher figure. Applying both of these figures to the intensity of use per unit of housing would result in a lower and a higher aggregate requirement at the end of the period, so you would have a lower housing scenario and a higher housing scenario. Similarly, the estimate of demand might want to take into account two scenarios where major road construction takes place within the planning period or does not take place, which would also give a lower and a higher aggregate requirement at the end of the period.

8 Supply Component of Proposed Toolkit

Purpose of Inclusion in Proposed Toolkit for developing an Apportionment Methodology

Understanding available supply of aggregates is important as primary aggregates can only be worked where they are found.

INTRODUCTION

- 8.1 There is a need to establish, as far as possible, the extent, quality and workability of aggregate resources available within the local spatial planning unit, which could be based on political boundaries or a particular geological resource, e.g. Thames Valley Gravels.
- 8.2 Consideration will need to be given to how total demand can be met, including the need for imports and/or exports and the mix of aggregate types to be supplied.
- 8.3 This section has deliberately excluded consideration of the input of marine aggregates and secondary and recycled aggregates into the supply system, as this project was commissioned to consider the land-won primary aggregate component only. Assumptions regarding the contribution of marine and secondary and recycled aggregates are made at the national level through the development of the National and Regional Guidelines for Aggregates Provision.

ESTIMATING TOTAL SUPPLY

- 8.4 Total supply of aggregate resources should be estimated from the range of information sources described below. In doing so, there is a need to make sure that resources have not been/will not be sterilised by development.

BGS Minerals Resource Data

- 8.5 Land-won aggregate resources include sand and gravel and crushed rock, information on which is available from the British Geological Survey (BGS). The best available information is the **DiGMapGB Mineral Resource data set**, available in GIS format at a 1:50,000 scale. This dataset was developed specifically to aid strategic minerals planning.
- 8.6 The data contain four main elements:
 - The geological distribution of all onshore mineral resources.
 - The location of mineral extraction sites.
 - The extent of mineral planning permissions and licences for coal extraction.
 - The extent of selected landscape and nature–conservation designations (National Parks, AONBs, SSSIs, NNRs and scheduled monuments).

- 8.7 The mineral resource data have been produced by the collation and interpretation of data principally held by the BGS. The data is based on 1:10 560 or 1:10 000 scale surveys, which cover most of the country. In general, the more recent the survey the more detailed it is likely to be.
- 8.8 The majority of the BGS mineral resource data show the extent of **inferred mineral resources**, that is, those mineral resources that can be defined from available geological information. Mineral resources defined on the map delineate areas within which potentially workable minerals may occur. These areas are not of uniform potential, nor do they take account of planning constraints which may limit their working. The economic potential of specific sites can only be proved by a detailed evaluation programme.
- 8.9 Where thematic sand and gravel assessment studies have been undertaken by the BGS, sufficient information is available to define mineral resources at the **indicated resource** level. Those resources defined at an indicated level are clearly differentiated in the current BGS mineral resource data.
- 8.10 It is possible to request further assessment of the data for a particular area to establish the thickness of deposits and thus an indication of the volume of different mineral resources present. However, this is unlikely to be practicable across a large area, so would need to be a targeted exercise. Further information on BGS data is presented in **Appendix 5**.
- 8.11 It is recommended in all cases that the BGS data is supplemented by local knowledge, by pooling information available from industry and MPAs on the extent, quality and workability of aggregate resources, including remaining reserves in existing permitted quarries etc (i.e. taking into account worked out areas of resource, which may not be apparent in the BGS data).

Unsterilised resources

- 8.12 Unsterilised resources are minerals resources that have not been sterilised by built development. It is essential that the area (and volume wherever possible) of unsterilised resource is calculated to give a more accurate picture of available resources. This can be done in GIS by overlaying ONS defined urban settlements and major transportation links (motorways, primary roads and railways) onto minerals resource data and subtracting any minerals resources covered by built development.

For example...estimating potential resource available for future supply

In the West Midlands, DiGMapGB-100 Mineral Resource data were made available. Consultation with MPAs however highlighted that there were gaps in the BGS data for this region (e.g. incomplete coverage of the Shropshire 'fault line' and south west Herefordshire). Whilst the BGS GIS data represented the best available at a regional level, there was a need to undertake some further processing to make the dataset fit for the apportionment.

The first task was to remove areas of the resource sterilised by urban development and associated infrastructure and worked out mineral sites. Using GIS, urban areas, roads and railways (with buffers to approximate their footprint) were removed. No comprehensive layer was available for worked out resources so data were requested from the MPAs. Where available, these sites were removed from the overall resource area. The resulting GIS map is shown in **Figure 8.1**.

Consultation with the WMRAWP highlighted that using the surface expression of the resource as an area (or footprint on the ground) was an inadequate measure of the resource in the region given that there are such large variations in deposit thickness across the region. Without any 'off the shelf' dataset on thickness in the region, three minerals planning officers (one a geologist) from the region analysed the deposit types and using local knowledge, approximated a mean working thickness for each deposit type in each sub-region. It was then possible to use these thickness values to translate the area (in hectares) to a volume (in tonnes) using bulk density figures for sand and gravel and crushed rock.

An alternative suggestion was to restrict the estimated volume of available resource to the areas of resource within each MPA sub-region which have existing extraction permissions, are allocated sites in development plans or are preferred areas or potential sites preferred by developers in emerging minerals development plans. While this was attempted, it was not possible in the time frame of the apportionment exercise to obtain GIS data for all of these sites consistently across the region. However, it is still an approach that could be considered by a grouping of MPAs undertaking a new apportionment exercise.

Past levels of aggregate production

- 8.13 Past levels of aggregate production can also be used to estimate levels of supply within MPAs based on historic trends, which inherently reflect environmental and social considerations taken into account through the planning system as planning permissions for mineral extraction are determined. The annual Aggregate Monitoring Survey reports, until recently produced by the Regional Aggregate Working Party (RAWP) provide data on past sales of aggregate minerals within the relevant region (together with information on the remaining reserves and landbanks).
- 8.14 In addition, the Aggregate Minerals Survey commissioned by DCLG is carried out every four years, and includes information on sales of aggregates, reserves, end uses etc.
- 8.15 An MPA's own Annual Monitoring Reports (AMRs) for the Minerals and Waste Development Framework (MWDF) contain valuable local information

on production levels, as well as current permitted reserves for sand and gravel and crushed rock within the MPA, and likely reserves arising from planning applications in the system.

Permitted reserves and landbanks

- 8.16 Permitted reserves are aggregates resources that are covered by existing planning permissions. MPAs are required to maintain landbanks of permitted reserves of at least seven years for sand and gravel and at least ten years for crushed rock.
- 8.17 It is important to collate and quantify information on the volume of aggregates available from permitted reserves and the time period over which existing planning permissions apply. This should incorporate the most up-to-date information on the planning status of sites, including the Review of Old Mineral Permissions under the Environment Act 1995.
- 8.18 Information on permitted reserves remaining and landbanks should be available from Regional Aggregate Working Party Annual Reports and Minerals Development Framework Annual Monitoring Reports at the MPA level.

IMPORTS AND EXPORTS

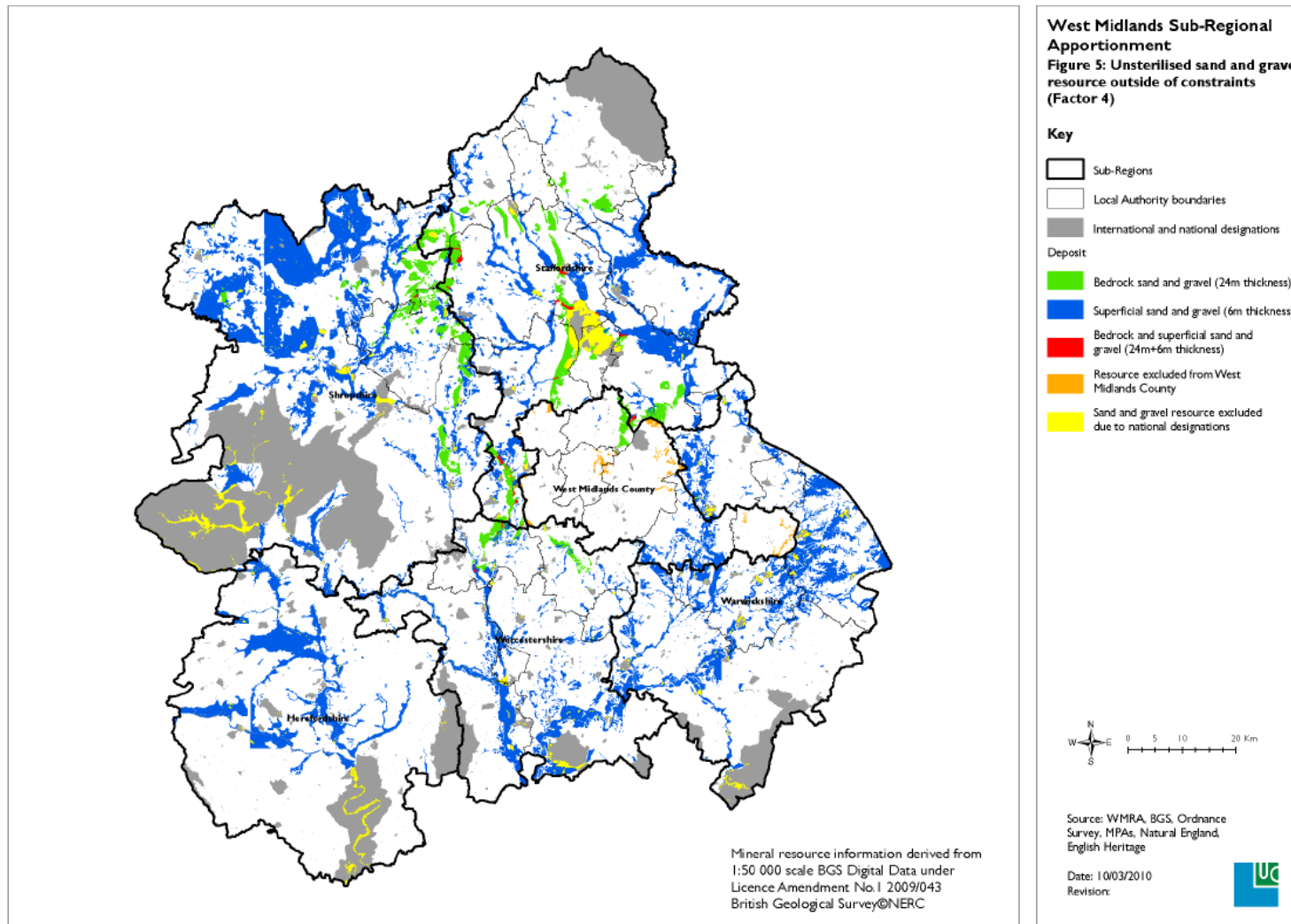
- 8.19 National policy aims to supply minerals indigenously in order to avoid exporting potential environmental damage elsewhere. However, minerals can only be won where they are found and market conditions also influence supply patterns.
- 8.20 National demand forecasts take into account inter-regional flows, and to some extent estimates of demand at the local level will have taken into account imports and exports (see **Section 7**). However, where shortfalls exist, aggregates may need to be imported from outside the area that the apportionment exercise is being applied to. It will therefore be necessary to establish where the required resources are available and engage in discussions with the relevant MPA(s). Supply may also need to be increased to meet demand in other areas with limited resources available. The data sources referred to above which describe past levels of production may give some indication of historically where imports or exports have been needed. Allowances for imports and exports to continue or change within an apportionment will need to be discussed and agreed between the stakeholder group or AWP developing the apportionment methodology.

For example... Idle Valley, East Midlands Sub-Regional Apportionment

The Idle Valley, in the north of the county of Nottinghamshire, is well placed to supply the southern MPAs in Yorkshire and Humber; in 2005 just over 1mt of sand and gravel was exported to Yorkshire and Humber from Nottinghamshire. However, reserves in the Idle Valley are low, with just over two years supply remaining based on 2007 figures, and MPA Officers have confirmed that new supplies will be difficult to find. It is therefore expected that production in the Idle Valley will fall sharply in the near future.

This potential cross-boundary supply issue was identified through the EMAWP sub-regional apportionment process, noting that it may be more sustainable for the MPAs in Yorkshire and Humber to address the shortfall in supply, rather than use resources elsewhere in Nottinghamshire that lie further from the areas of demand. The Report recommends that if supply of this shortfall from within Nottinghamshire proves to be logistically or environmentally inappropriate, negotiations should be held with the relevant MPAs in the Yorkshire and Humber RAWP to identify alternative sources of supply.

Figure 8.1: GIS mapping used in the West Midlands Sub-Regional Apportionment



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 SM47004795 WM Aggregate Apportionment GIS Themes ArcGIS194795-01_039_FR_Niz_Div_SG_Fig5.mxd

9 Environmental Issues Component of Proposed Toolkit

Purpose of Inclusion in Proposed Toolkit for developing an Apportionment Methodology

The consideration of environmental issues is a core element of sustainability and therefore should be taken into account when developing a robust, sustainable apportionment methodology.

- 9.1 'Environmental issues' is a very broad component of the proposed apportionment methodology, covering a wide range of considerations not all of which will be relevant in all situations. In particular, from the review of sub-regional apportionment methodologies (**Section 5**), it is clear that certain environmental issues are 'strategic' and should be considered when apportioning the regional aggregate guidelines figures between groupings of MPAs, while other environmental issues are more 'local' and better suited to detailed consideration through the Minerals Development Framework preparation by MPAs. The strategic environmental issues that are recommended for inclusion within the proposed apportionment method are described below, and the justification for leaving some environmental issues to the MDF process is also provided below.
- 9.2 The environment is one of three widely accepted cornerstones of sustainability, the other two being social and economic considerations. Although these three cornerstones are often considered separately, the topics within them can overlap. For example, community wellbeing, one of the environmental topics listed below, is equally a social issue.

ENVIRONMENTAL TOPICS FOR CONSIDERATION IN THE PROPOSED APPORTIONMENT METHOD

- 9.3 In developing a strategic-level apportionment methodology, the full range of environmental topics covered by the SEA Directive¹² and guidance contained in Minerals Planning Statement (MPS) 1, MPS2 and Planning Policy Statement (PPS) 1 should be considered. The environmental topics are listed in **Table 9.1** together with a short description of their relevance to aggregates.

Table 9.1: Environmental topics and their relevance to aggregates

Environmental topic	Relevance to aggregates
Biodiversity, flora and fauna	Biodiversity, flora and fauna can be both positively and negatively affected by aggregates extraction. Aggregate workings require the removal of habitats to allow extraction to take place and can disturb surrounding flora and fauna through noise, air and water pollution.

¹² Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment, 27 June 2001

Environmental topic	Relevance to aggregates
	<p>Conversely, restoration of aggregates sites can create habitat and positively contribute to the conservation of important flora and fauna.</p> <p>Protected geological sites can be located within active aggregate workings. Such sites have the potential to be damaged by extraction, but can also provide a valuable method of providing access to such sites and keeping exposures accessible for research and scientific study.</p>
Community wellbeing	<p>Aggregates positively contribute to community wellbeing through the provision of construction materials for new schools, hospitals, community centres, roads etc, and employment opportunities. Restored sites can also provide recreation opportunities.</p> <p>Negative impacts can occur as a result of increased traffic, especially heavy goods vehicles, during operation. Other potential impacts on people are reflected under human health and air quality below.</p>
Human health	<p>The extraction of aggregates has the potential to negatively affect human health through noise, air and water pollution. However, these effects can generally be overcome through legislation and appropriate site management. Restored sites can have a positive impact on human health through the provision of recreation opportunities.</p>
Soil quality and resources	<p>The removal and storage of soil stripped to allow extraction to take place can damage the soil structure and lead to soil erosion. However, through following best practice in soil handling techniques this impact can be minimised. Extraction of aggregate provides vital materials for the construction industry, but it is important to ensure that the best use is made of all material extracted to make the process as sustainable as possible.</p>
Flood risk	<p>Aggregate workings could exacerbate flood risk if they reduce the overall capacity of the floodplain; however, in general aggregate sites are floodplain compatible uses and can have a positive effect on flood risk by providing flood water storage capacity once workings have ceased.</p>
Water quality and resources	<p>Pollution and siltation of water courses can occur as a result of aggregate workings; however these potential impacts are generally overcome through legislation and appropriate site management.</p>
Air quality	<p>Air pollution can occur as a result of aggregate workings; however legislation and appropriate site management generally prevents air pollution from occurring.</p>
Cultural heritage	<p>The extraction of aggregates can negatively affect heritage</p>

Environmental topic	Relevance to aggregates
	assets through the removal of archaeology and/or impacts on the setting of heritage features, although the excavation and recording of known and previously unknown archaeological finds can have a positive impact.
Landscape	In general, aggregate sites can have a negative impact on landscape, although this can be minimised by sensitive site design and management. New landscapes can be created through restoration.
Built environment	Aggregates positively contribute to the built environment through the provision of construction materials for new schools, hospitals, community centres, roads etc.
Carbon use and greenhouse gas emissions	Aggregate extraction, processing and transportation are energy intensive processes. The resulting emissions contribute to climate change.

STRATEGIC ENVIRONMENTAL ISSUES TO BE INCLUDED IN PROPOSED APPORTIONMENT METHOD

- 9.4 Within the environmental topics listed in **Table 9.1**, the review of existing apportionment methodologies identified a number of considerations that can be readily used in the development of apportionment options at the strategic level. These can be divided into those that result in a constraint on aggregate extraction and those that relate to the proximity principle i.e. the distance between aggregate quarries and the areas of demand:

Constraining environmental topics:

- **International and national nature conservation designations** – Ramsar sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and National Nature Reserves.
- **National Landscape Designations** – Areas of Outstanding Natural Beauty, National Parks and Heritage Coasts.
- **Heritage Assets** – Listed Buildings, World Heritage Sites, Registered Parks and Gardens, Scheduled Ancient Monuments and Historic Battlefields.

Environmental topics relating to the proximity principle

- **Air quality and climate change** – by reducing the distances aggregates are transported the use of fossil fuels and emissions generated will be reduced, which has a positive impact on air quality, climate change and human health. In addition, the use of sustainable modes of transport over long distances can also reduce fossil fuel emissions.

- 9.5 These environmental topics are discussed further below, describing why each should be included within an apportionment methodology, the type of data

and methods that can be used allow each to be considered and any potential limitations.

- 9.6 A number of the environmental topics set out in **Table 9.1** may not be relevant in a strategic level apportionment exercise. For example, potential air quality impacts of aggregate workings are addressed at the site level through legislation and site management procedures, therefore it is not appropriate to include air quality impacts in a strategic-level apportionment methodology. A list of environmental issues that are recommended for exclusion from a strategic level apportionment exercise is provided later in this section, with justification for why these issues are more relevant and better able to be addressed through the local MDF process. However, where such environmental topics are identified as not relevant to the apportionment or geographical area covered, the reasons for their exclusion from further consideration within the methodology should be reported.

International and national designations

- 9.7 The presence of internationally and nationally important designations (nature conservation, landscape or heritage assets) will constrain mineral development in certain locations, and the apportionment methodology should reflect the degree of constraint. For example, it would be contrary to planning policy and only acceptable in exceptional circumstances to permit new major minerals developments in an AONB, compared to less constrained locations.
- 9.8 That said, it is acknowledged that mineral working does occur within and in close proximity to a number of national and international designations (and indeed helped to create the habitat or heritage environment that was subsequently designated), with some workings providing substantial benefits upon restoration. Work undertaken in the Mendips has explored the potential for the benefits associated with quarry restoration to drive long term minerals planning; this is explored further below.
- 9.9 The designations listed above should be considered as a minimum, where one or more of these designations are excluded from the methodology, clear justification should be provided and plainly documented. Once those designations that should be taken into account within the apportionment methodology have been identified, how they should be taken in account needs to be decided.

Data, limitations and methods

- 9.10 Key data sources for this environmental topic are the location and extent of nature conservation, landscape and heritage asset designations. These can be obtained from:
- Natural England (the data can be downloaded www.magic.gov.uk which links to the Natural England GIS data download facility).
 - English Heritage (the data can be downloaded from www.magic.gov.uk which links to the English Heritage National Monuments Record download facility).

- 9.11 The methodology used to feed this data into the development of the apportionment methodology must be considered carefully. Questions should be posed such as how constraining is the designation being considered? Is it an absolute constraint? Should the designations be overlaid, with those areas covered by more than one designation seen as a greater constraint, or should the level of constraint be judged according to the level of designation (international or national)? Should the designation be buffered?
- 9.12 Existing sub-regional apportionment methodologies provide some possible answers to these questions:

How should the level of constraint be judged?

In generating the Assembly apportionment options in the West Midlands, international and national nature conservation, landscape and cultural heritage designations were incorporated by using GIS layers to calculate the area of 'unconstrained' resource outside these designations i.e. all designations were considered to be equally constraining on the extraction of aggregates.

Should designations be buffered?

The buffering of designations was considered during the apportionment process undertaken in the South East of England and applied to the international designations to reflect the need to protect SACs, SPAs and Ramsar sites under the Habitats Regulations as well as the setting of the heritage designations. However, the size of the buffer was clearly stated as being an arbitrary distance that should not be seen as having any significance in policy terms. Through discussions with Natural England and the Steering Group, it was decided that this illustrative buffer would be 250m.

- 9.13 Where the GIS data is available as a point dataset rather than an area or polygon dataset e.g. listed buildings, it is not possible to calculate the area of unconstrained resource. During the apportionment process undertaken in the South East of England, the inclusion of heritage assets was discussed by the Steering Group (including a representative of English Heritage) taking into account the fact that the policies associated with heritage assets are normally site specific and therefore a level below the sub-regional apportionment being developed. English Heritage suggested that the density of heritage assets per hectare of resource could be used to indicate the level of constraint, and this was included in the methodology used to generate apportionment options.

Air quality and climate change and the Proximity Principle

- 9.14 Emissions from the transportation of aggregate from quarry to area of demand contribute to climate change, therefore minimising transport distances and maximising the use of what are termed sustainable modes of transport (rail and water rather than road) should be considered in an apportionment methodology. Adequate transport links between the locations where minerals are worked, where they are processed, and where they are used are essential. Ideally these three things should occur in close proximity.

- 9.15 However, the review of existing apportionment methodologies highlighted the difficulties in taking emissions from transport into account during a strategic level apportionment process; this is discussed further below.

Data, limitations and methods

- 9.16 To enable transportation emissions to be considered, data such as the location of aggregate quarries, the geographical areas they serve and the location and capacity of sustainable transport modes is required. Potential data sources include the Annual Monitoring Surveys undertaken by the RAWPs, the DCLG four yearly Aggregate Minerals Survey and the relevant Minerals Development Frameworks. Other information sources may also be available.
- 9.17 Taking emissions from transport into account through the mileage travelled and mode of transport used proved difficult in a number of the existing apportionment methods used to date. In the South East of England, it was initially suggested that sustainable transport could be taken into account by assessing the location of wharves, road and rail (including depots) provision in the Region, possibly being expressed in terms of density of provision by mineral planning sub-region. However, problems arose when trying to implement this in practice:
- data on the location and capacity of sustainable transport modes was not available;
 - where information was available, the existing sustainable transport modes do not necessarily link source with demand;
 - an area could have lots of rail depots but no resource because material is imported;
 - there is at present very little transport of aggregates by water or rail from internal sources, thus, any apportionment which relies heavily on sustainable transport may signal the need for significant investment in new and / or upgraded transport facilities;
 - established commercial contracts for transporting aggregates are generally not widely known and, in any case, may not be compatible with some aspects of proximity because they result in some materials being transported over long distances.
- 9.18 As a result of these issues, the project Steering Group for the South East exercise agreed that sustainable transport should be omitted as a criterion in the sub-regional apportionment. However, it was recognised that consideration of the demand for aggregate within the apportionment methodology would help to encourage supplies in close proximity to demand due to the cost associated with transporting bulk materials. Similar reasoning was provided in Yorkshire and Humber and the West Midlands.
- 9.19 Rather than focus on sustainable modes of transport, the aggregates planning system in Wales sought to apply the proximity principle. The approach used aimed to source material from as close as possible to the consumer through aligning quarrying locations with the distribution of population (the latter as a proxy for demand).

South Wales Regional Technical Statement

The relatively wide distribution of aggregates in the South Wales region has led to 95% of deliveries being made by road. Those sites that regularly use rail haulage are supplying rail ballast or high specification aggregate. As such, consideration of the emissions from transport has focussed on reducing the mileage travelled by road rather than encouraging the use of more sustainable modes of transport.

In order to reduce the mileage travelled by road, the proximity principle was applied, aiming to source material from as close as possible to the consumer. Past sales data were used to provide the sources of crushed rock. Attempts were made to calculate existing consumption per MPA; however this did not prove to be possible. Instead, population was used as a proxy for consumption by applying the average national consumption per capita to population distribution to obtain an annual consumption of crushed rock per MPA.

Comparison of the per capita consumption of crushed rock within each MPA (the demand) with the output from each MPA that was sold within the South Wales region (to exclude exports outside the region) provides a very generalised indicator of those MPA areas that are contributing more than their 'share' and those that are dependent on supply from others.

Using the outcome of this comparison, and a consideration of existing permitted reserves, the South Wales Regional Technical Statement provided guidance to each MPA as to whether it has sufficient reserves to be self sufficient in crushed rock, or whether, as in the case of Swansea, the MPA should look to make allocations in their LDP in order to be less reliant on imports and therefore reduce the mileage travelled by crushed rock.

LOCAL LEVEL ENVIRONMENTAL ISSUES

- 9.20 The exclusion of some environmental topics from the proposed apportionment method does not mean that they are any less important or affected any less by aggregate extraction. There are some environmental topics that may only be relevant in certain areas and those that are better considered at the MPA or site level.

For example....

In the apportionment process undertaken in the South East of England, it was agreed that certain environmental factors would be omitted for the following reasons:

- Floodrisk zones - this type of development (i.e. primary aggregate extraction) is considered 'water compatible' - the very nature of the material means that it can be found in floodplains;
- Groundwater source protection zones - site management can overcome the potential constraint;
- Safeguarding around aerodromes – site management can overcome the potential constraint of bird strike resulting from restored minerals sites;
- Green Belt – mineral extraction is an acceptable use in the Green Belt;
- Local designations and non-spatial designations such as habitats of Principal Importance – it was not seen as appropriate at the sub-regional level to consider local and non-spatial environmental designations as these should be assessed strategically by the MPA as part of their environmental responsibilities in line with their regional BAP targets, PPS9 and the relevant South East Plan policies.

9.21 It is recommended that the following environmental issues are not included in a strategic-level apportionment exercise, for the reasons described.

9.22 As highlighted above, extraction of primary aggregates represents an acceptable or compatible land use in certain areas, and therefore the following environmental issues do not need to be considered in a strategic-level apportionment exercise:

- **Extraction in flood risk zones.**
- **Extraction in Best and Most Versatile Agricultural Land.**
- **Extraction in the Green Belt.**
- **Extraction within safeguarding areas around aerodromes.**

9.23 Within the full range of environmental topics listed in **Table 9.1** certain impacts are more appropriate for consideration by individual MPAs rather than at a strategic level, including:

- **Effects on local biodiversity designations.**
- **Effects on local landscape designations.**
- **Capacity of the local transport network.**

9.24 As described in **Table 9.1**, the impacts of aggregate extraction on certain environmental topics can be overcome through on-site management and/or are regulated through legislation. As such, these are therefore likely to be more appropriate for consideration on a site-by-site basis at the planning application stage, and do not need to be considered in a strategic-level apportionment exercise:

- **Protection of groundwater.**

- **Protection of residential amenity i.e. from noise and air pollution.**

OTHER SUSTAINABILITY CONSIDERATIONS/APPROACHES

Sustainability Appraisal/Strategic Environmental Assessment and Habitats Regulations Assessment

- 9.25 The proposed toolkit includes environmental issues as one of the three core components of an apportionment methodology, and therefore ensures that environmental considerations are taken into account as part of the process of apportioning aggregate provision between spatial planning units. However, it is likely that any resulting apportionment options will be required to be subject to a Strategic Environmental Assessment (SEA) and Sustainability Appraisal (SA), in accordance with the requirements of European Directive 2001/42/EC (the SEA Directive)¹³ and the Planning and Compulsory Purchase Act 2004. This requirement will depend to a certain extent on where the apportionment options fit into the planning system, as they will no longer form the basis of a minerals policy in a Regional Spatial Strategy. It is anticipated that the MPAs would need to consult on any options for how much aggregate they need to plan for through their MDF process, and in this case SEA and SA would currently be required to accompany that consultation.
- 9.26 The purpose of sustainability appraisal is to promote sustainable development by integrating sustainability considerations into the preparation and adoption of policies, plans and programmes. The objective of Strategic Environmental Assessment, as defined in Article 1 of the SEA Directive is more tightly focussed on environmental effects: *'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans...with a view to promoting sustainable development'*. In line with Government guidance, both of these requirements can be satisfied through a single appraisal process referred to as a Sustainability Appraisal.
- 9.27 When consulting on a set of apportionment options, the group of MPAs is also likely to be required to undertake a Habitats Regulations Assessment (HRA) to determine whether or not the apportionment options are likely to have an adverse effect on the integrity of on any Special Areas of Conservation, Special Protection Areas or Ramsar sites.

Economic issues for aggregate apportionment

- 9.28 The main economic benefit of aggregates extraction is the contribution it makes to the economy as a whole, through the provision of raw materials required by the construction industry and the associated employment this creates. The 2008 British Geological Survey report 'The need for indigenous aggregates production in England' reported that the gross value added of the

¹³ Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment, 27 June 2001.

English primary aggregates industry is over £1 billion per year, with an additional £1 billion resulting from downstream industries such as manufacturers of concrete. However, the largest benefit derived from the aggregates industry is in providing raw materials to the construction industry which has a gross value added contribution of more than £50 billion per year.¹⁴

- 9.29 Although clearly important, the sustainability implications of the contribution of aggregate extraction to the economy are not something that has been taken into account within the existing apportionment methodologies. However, should there be a large disparity in unemployment or wealth within the geographical area covered by the apportionment; this may be something that could be considered.

Ecosystems services approach

- 9.30 A newer approach to assessing sustainability is the ecosystem services approach. Defra's ecosystems approach provides "*a framework for looking at whole ecosystems in decision making, and for valuing the ecosystem services they provide, to ensure that society can maintain a healthy and resilient natural environment now and for future generations*".¹⁵ Ecosystem services can be defined as services provided by the natural environment that benefit people, such as protection from hazards through climate regulation and educational benefits of interaction with nature. The use of this approach could help in considering environmental, social and economic issues within an aggregates apportionment exercise.

For example....

Cuesta Consulting Ltd were commissioned by the Minerals Industry Research Organisation (MIRO) to undertake a feasibility study into the concept of using Defra's Ecosystems Approach to inform the long-term planning of aggregate quarrying and restoration in the Mendip Hills – one of the most strategically important sources of construction aggregate in England.

The feasibility study started with the understanding that by taking a strategic, long-term approach to the location of quarries and their restoration, an integrated landscape strategy could be implemented in the Mendips. The necessity for aggregate extraction in the area provides the opportunity and the mechanism for creating substantial and sustainable environmental improvements. The study found that this joined up approach to quarry planning can make positive contributions to such things as biodiversity, geodiversity, agriculture, the water environment, heritage assets, amenity, infrastructure, tourism and the overall economic well-being of the area.

- 9.31 Further information on the ecosystems approach can be found on Defra's website at <http://www.defra.gov.uk/environment/policy/natural-environ/ecosystems/index.htm> and a copy of the final report of Phase II of the

¹⁴ British Geological Survey (2008) *The need for indigenous aggregates production in England* Open Report OR/08/026

¹⁵ Defra website (accessed 9th December 2010): <http://www.defra.gov.uk/environment/policy/natural-environ/ecosystems/index.htm>

An Ecosystems Approach to Long Term Minerals Planning in the Mendip Hills
can be found at:
http://sustainableaggregates.co.uk/strategic_research/reports/project_3_final_report.pdf

10 Developing Alternative Apportionment Options

Purpose of Inclusion in the Proposed Apportionment Method

Developing alternative apportionment options enables consideration of applying different priorities or weighting to the three core components (demand, supply and environmental issues) when apportioning future aggregates provision between MPAs. The core components of demand, supply and environmental issues can be combined and weighted in different ways to develop options that can be compared alongside each other. Development of options should also enable appraisal of the alternative apportionments, which should lead to the selection of the most sustainable outcome, and help to meet the requirements of Sustainability Appraisal/Strategic Environmental Assessment and Habitats Regulations Assessment.

SCOPE OF APPORTIONMENT OPTIONS

- 10.1 A strategic-level apportionment option will distribute aggregates provision by MPA in order to meet total demand (from the National and Regional Guidelines or the results of a local demand assessment) over a specified period. The development of alternative apportionment options will help to decide upon a final apportionment of a national or regional guideline figure between MPAs and make for a transparent process. It is important to note that apportionment options are distinct from any forecast 'scenarios' or options that may have been considered by MPAs when estimating local demand for aggregate (see **Section 7** – Demand Scenarios or Options).
- 10.2 Alternative apportionment options should be developed from the data and information collated and analysed under the core components of:
 - 1 Demand.
 - 2 Supply.
 - 3 Environmental issues.
- 10.3 Apportionment options may be based on a single component or combinations of more than one. However, it is important to ensure that the full range of options developed takes account of all three components and that data is compiled and analysis undertaken for each.
- 10.4 It is for MPAs to jointly develop apportionment options that are suited to their local circumstances and allow for meaningful comparison of alternatives. In order to decide upon the final apportionment, the process may need to be iterative, for example, an appraisal of an environmental-led option may result in other supply- or demand-led options being revisited.

Reasonable Alternatives Only

Only reasonable alternative options need be developed and compared alongside each other i.e. those that are considered to be realistic and achievable. In certain circumstances it may be that no reasonable alternatives exist e.g. where aggregate resources are extremely limited, in which case more than one apportionment option will not need to be developed. The reasons for this will need to be clearly recorded, however.

TYPES OF APPORTIONMENT OPTION

- 10.5 Options can be developed to reflect combinations of demand, supply and environmental components, with different weightings attached if desired. Examples of various apportionment options are described below, with an outline of how each might be developed. It is recommended that any apportionment option developed is clearly linked to robust evidence collated for the three core components, directly using the evidence to quantify the apportionment wherever possible.
- 10.6 Data availability and limitations were described in the preceding sections on Demand, Supply and Environmental Issues and can be drawn upon in developing apportionment options.

1. Demand-led options

- 10.7 Demand-led options would be influenced by the quantity and location of future demand for aggregates between MPAs, which can be estimated by applying population and/or development plan housing provision figures (and other development requirements) to an assumed intensity of aggregate use per type of end-use (house-building, road building etc) (see Demand, **Section 7**).
- 10.8 The different levels of aggregate demand within each MPA can then be converted into proportional percentages of the total between all MPAs. This percentage share can then be applied to the total amount of aggregate to be provided, thereby generating the apportionment option.

2. Supply-led options

- 10.9 Supply-led options could be based on the area or quantity of unsterilised aggregate resource available within each local spatial planning unit and the location of this resource. Alternatively, data on past sales or production of aggregates within each MPA could be used as a basis for estimating likely future levels of supply.

Unsterilised resource

- 10.10 The area or quantity of unsterilised resource can be calculated using BGS data (see Supply, **Section 8**) and GIS. This can be done by different types of resource in the first instance, but for the purposes of the apportionment will need to be converted into MPA-level data. The unsterilised resource

available within each MPA can then be converted into proportional percentages and applied to the total amount of aggregate to be provided.

- 10.11 This MPA-level supply data by can be compared to local demand forecasts to determine any local shortfalls and surpluses between MPAs. Further options could then be developed for making up any shortfalls.

Past sales/production of aggregates

- 10.12 The historical trends in aggregate production or sales can also provide an estimate of likely levels of supply in an MPA. As discussed in **Section 8** (Supply), past sales figures have been produced regionally by RAWPs, nationally by the BGS for DCLG, and also by MPAs in their Annual Monitoring Reports. In generating a supply-led option, the past sales figures for each MPA within the spatial planning unit being covered by the apportionment exercise, can be converted into proportional percentages and applied to the total amount of aggregate to be provided.

3. Environment-led options

- 10.13 The range of environmental topics to consider in a strategic-level apportionment exercise is described in **Section 9**. Apportionment options could be based on one or more of the following:

Unconstrained resource

- 10.14 One potential environment-led option would use the area of environmental designations within each MPA to determine the apportionment. Under this option, any aggregate resource within an environmental designation set out in **Section 9** would be removed from consideration for the purpose of generating the apportionment figures. This could also include a defined buffer area around particular designations, for example, to take account of the setting of heritage features, or disturbance to nature conservation sites. This can be done using GIS.
- 10.15 The remaining 'unconstrained' aggregate resource can be converted into volumes or proportional percentages by MPA and applied to the total amount of aggregate to be provided. By reflecting the amount of resource in each MPA that is within an environmental designation, and therefore is more sensitive to extraction, it is possible to influence the aggregates apportionment to move supply to areas less constrained by designations.

Proximity of supply to demand

- 10.16 Due to the environmental impact of transporting aggregate (discussed in **Section 9**), it is recommended that environment-led options consider the proximity of supply to demand, thereby taking account the need to reduce the distance over which aggregates are transported. This can be done in GIS by developing a series of proximity buffers from the main urban areas and settlements, used as a proxy measure for where demand is generated. The amount of unsterilised resource within each buffer can then be calculated by MPA. This data can then be converted into volumes or proportional percentages by MPA and applied to the total amount of aggregate to be provided.

- 10.17 This approach does not take account of transport routing or mode of transport as this information is very detailed and not easily applied in a strategic-level apportionment exercise. Nonetheless, it is recommended that where this data is readily available it is drawn upon to inform the final apportionment.

Example: North East 'Potential Resources and Market Location' Scenario

The Potential Resources and Market Location Apportionment Scenario was developed as it was acknowledged that the greatest demand for aggregate materials is likely to be found in the Tees Valley and Tyne and Wear and therefore greater account should be taken of the potential resources available in these two sub-regions. The amount of aggregate to be sourced from the Tees Valley and Tyne and Wear was therefore increased to reflect their greater share of the market. The amounts were increased to 70% of the total potential resources identified for Tees Valley and Tyne Wear, which was considered high enough to reflect the focus of the market in these areas but low enough to account for the other market pressures in Durham and Northumberland. This approach helped to minimise the transport of materials from source to the markets.

Cumulative impacts and environmental capacity

- 10.18 An alternative approach is to consider the cumulative pattern of environmental constraints. This would involve overlaying all environmental constraints in GIS and developing categories or thresholds relating to the numbers of overlapping environmental constraints. Again, buffers could be used alongside certain constraints to take account of indirect impacts. The area of resource within each MPA covered by each category or threshold can be calculated and shown in GIS. As with the above approaches, the resulting data would be converted into volumes or proportional percentages by MPA and applied to the total amount of aggregate to be provided.

Example: Environmental capacity in Wales

GIS data was used to generate a 'traffic light' system of assessment, relating to environmental capacity in areas containing geological resources. Environmental capacity thresholds were defined in relation to a range of environmental topics and used to develop boundaries represented by red, orange and green lights. These thresholds can be changed, and a weighting system can be used to vary the initial assumption that all 12 environmental topics (or groups of topics) have equal weight. Although these are not strictly options – rather they produce gradations along a continuum of environmental capacity – they can be manipulated to examine the effect of changes in assumptions on the revealed preferences (i.e. proportions of red, orange and green areas).

4. Combined options with weighting

- 10.19 Combined options could also be developed by combining selected criteria (e.g. past sales, demand from existing and future development, area of

unconstrained resource etc.) and weighting the relative importance of each one. For example, by giving more weight to past sales and equal weighting to all other criteria, an apportionment option would be developed that took all criteria into account, but was influenced most by the pattern of past sales.

- 10.20 This type of approach was considered in the South East, West Midlands and Yorkshire and Humber Regions. Criteria and options developed for the South East Region are described in the example below.

Example: South East Region Apportionment Options

The following five criteria were agreed:

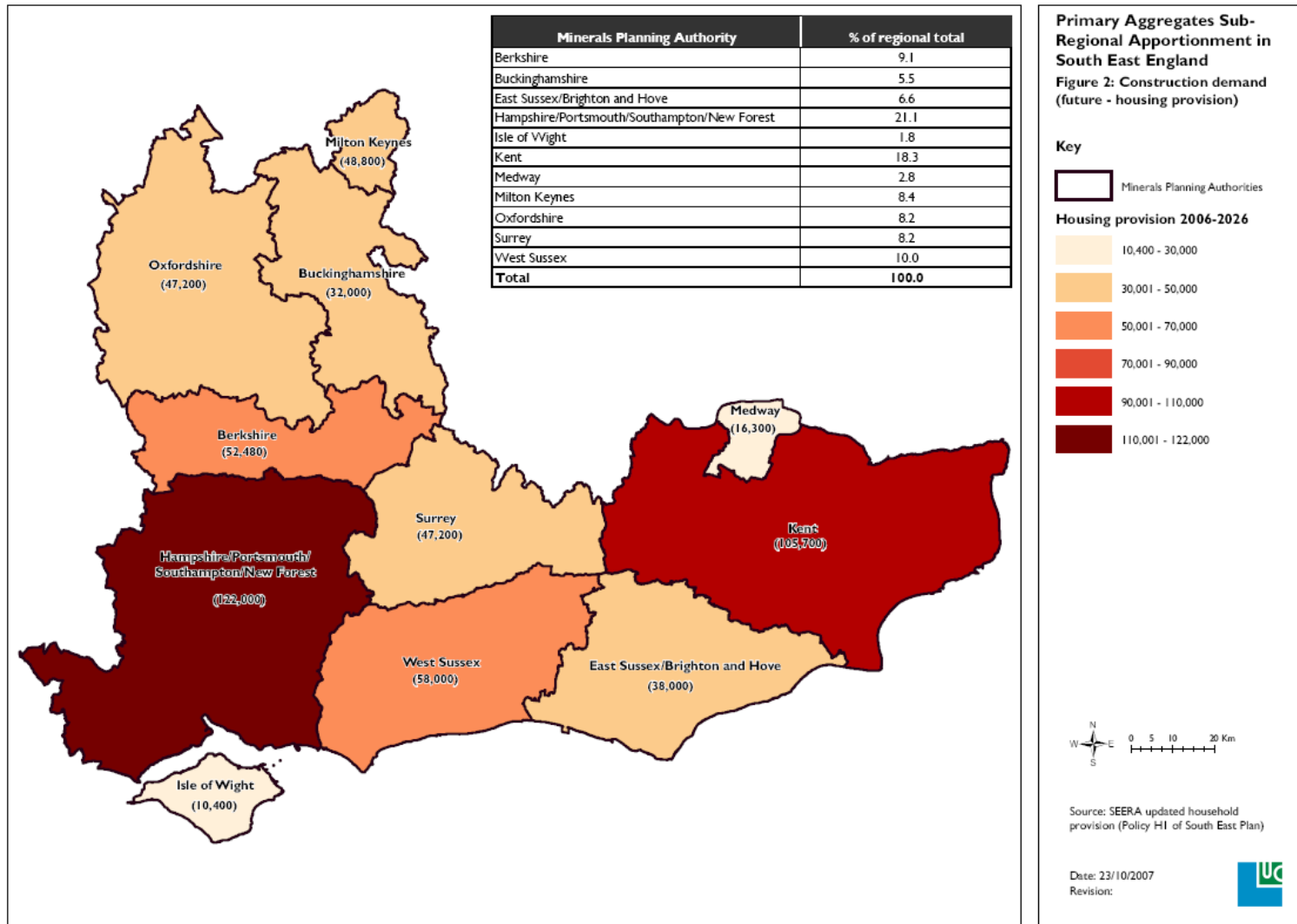
- Criterion 1: Construction Demand (with a ratio of 1:9 for 1a and 1b)
 - Criterion 1a: Future (Housing provision)
 - Criterion 1b: Current (Existing population)
- Criterion 2: Past Sales
- Criterion 3: Unsterilised resource outside of international designations (+250m buffer)
- Criterion 4: Unsterilised resource outside of international designations (+250m buffer) and outside of national designations.

The GIS used for Criteria 1a and 1b is shown in **Figure 10.1** and **Figure 10.2**.

The six alternative options were created by feeding the datasets into a Microsoft Excel based database, and using multi-criteria analysis, applying weightings to each criterion to reflect the strength of influence of each criterion:

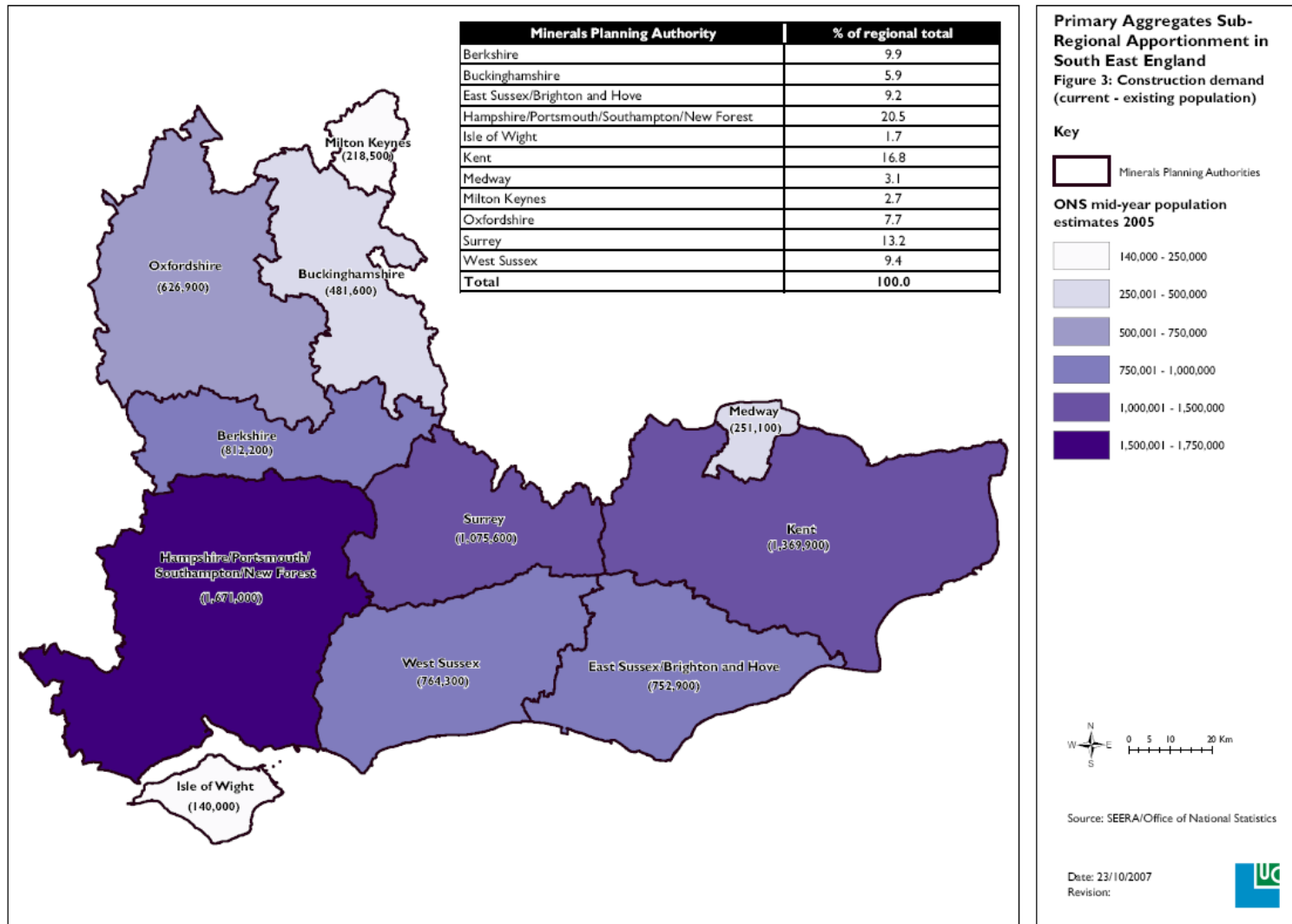
- Option A: weighted 70% on sales, and 10% each for other criteria (with a 9:1 ratio for current : future construction demand) – referred to as ‘Past sales’
- Option B: weighted 70% on supply i.e. unsterilised resources outside of international designations (+250m buffer), and 10% each for other criteria (with a 9:1 ratio for current : future construction demand – referred to as ‘Resource’
- Option C: weighted 70% on construction demand (with a 9:1 ratio for current : future construction demand), and 10% each for other criteria – referred to as ‘Demand’
- Option D: weighted 70% on the unsterilised resource outside of international designations (+250m buffer) and outside of national designations and 10% on each other criteria (with a 9:1 ratio for current : future construction demand) – referred to as ‘Environmental’
- Option E: evenly weighted between demand and resources, but with more emphasis on demand arising from existing population. 50% on demand (40% construction demand in 9:1 ratio; and 10% on sales) and 50% on supply (40% on unsterilised resources outside of international designations (+250m buffer) and 10% on the unsterilised resource outside of international designations (+250m buffer) and outside of national designations) – referred to as ‘Demand and resource’
- Option F: evenly weighted between all 4 criteria (25% each) – referred to as ‘Equal weighting’

Figure 10.1: GIS mapping used in the South East England Sub-Regional Apportionment for Criterion 1a



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 File: S:\4000\4097 SEERA Primary Aggregates Apportionment\GIS\Themes\ArcGIS\Final v3 report figures Cox 07\4097-01_064_FR_Criterion1a.mxd

Figure 10.2: GIS mapping used in the South East England Sub-Regional Apportionment for Criterion 1b



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 File: S:\10001097 SEERA Primary Aggregates Apportionment\GIS\Themes\Src\GIS\Final v2 report figures Cox_07\1097-01_065_CR_Criterion1b.mxd

11 Comments on the National Aggregate Guidelines Allocations to Regions

- 11.1 The final section of the report summarises the study team's suggestions on how the process of apportioning the national demand forecast figure to the regions could be improved. The suggestions are prescribed to reflect the various components and characteristics of the proposed toolkit for an apportionment methodology presented in **Section 6**.

Environmental issues

- 11.2 The national apportionment of the aggregates guidelines to individual regions is a purely technical process where key parameters reflect past patterns of aggregates supply rather than patterns that might be preferable in future. If comparative environmental constraints between regions are to be taken into account in the process, then this approach would have to change.
- 11.3 The kinds of approach used to apportion aggregates requirements between MPAs within regions, reflecting environmental constraints, could in theory be used nationally. This would aim to demonstrate an environmental even-handedness between regions, in particular reassuring exporting regions that they were not being required unduly to shoulder burdens for the environmental benefit of importing regions. This could become unwieldy because it would afford little weight to the merit of meeting local demands through local supplies, downplaying the impact of aggregates transport over longer distances as the means of minimising the local environmental effects of aggregates working.
- 11.4 The opportunity is needed for individual MPAs and regions to be able to argue that different assumptions are justified, especially about inter-regional aggregates movements, because of the environmental difficulty of continuing to meet demand through the historic pattern of supply. There should, for instance, be a formal opportunity for the London region to argue that increased supplies of land-won sand and gravel should be provided from Essex in the East of England due to the rundown in local land-won supplies in London. A hearing held by an independent Inspector would be an appropriate mechanism to resolve this, possibly resulting in a decision to change the scale of inter-regional movement assumed in the regional apportionments (expressed as a percentage of overall consumption). This process would tie in with the consideration of alternatives (see 4: Consideration of Alternatives below), which in this case would no doubt include the options of continued local working in London, increasing landings of marine-dredged sand and gravel, long-haul rail imports of rock, sea-borne imports of rock or alternative aggregates, or road imports of land-won aggregates from other regions around London.

Evidence of demand

- 11.5 The forecasts of regional aggregates consumption used in the National Guidelines are 'constrained' to sum to the national forecast. It is possible that the regional forecasts may individually be more realistic in each region

than the 'constrained' share of the national forecast. There may be merit therefore in presenting results both with and without the constraining effect, to inform the regional allocation process.

Evidence of supply

- 11.6 Inter-regional movements of aggregates are fixed in the Guidelines at the percentage of national consumption which prevailed in the most recent four-yearly Aggregate Minerals Survey. This discourages policy-based or market-based changes to the supply pattern, even if these would be sensible responses to consumption requirements or would introduce more sustainable patterns of supply (e.g. by inter-regional rail movements).
- 11.7 The overall allocation to each region is divided between material types in the proportions which were supplied in the most recent four-yearly Aggregate Minerals Survey. This too discourages policy-based or market-based changes to the supply pattern, even if these would be sensible responses to consumption requirements or would introduce more sustainable patterns of supply.

Consideration of alternatives

- 11.8 There is considerable merit in the approach currently used to generate regional aggregates allocations so far as alternatives are involved. Having established the demand in each region, the Government fixes first the target provision of alternative aggregates and marine-dredged sand and gravel. Provision by land-won aggregates is then a residual. This enables the Government to drive policy on sustainable aggregates provision. This has been exercised effectively but reasonably to increase the proportion of alternative aggregates expected as a matter of policy to supply the market. Indeed as supplies from this source have increased in response, the target has been raised to continue to put pressure on the sector to strive to achieve more.
- 11.9 A possible weakness however is that there is only limited discussion about it. The matter may be aired at meetings of the National Co-ordinating Group (of the Regional Aggregates Working Parties), and can be raised by anyone interested when draft *National and Regional Guidelines for Aggregates Provision* are consulted upon once every few years (which is essentially too late in the process to have much impact). There would be benefit in the Government arranging debates as formal inputs to the Guidelines preparation process to improve this. Some authorities are making significant efforts to promote the increased use of alternative aggregates, such as Cornwall with aggregates by-products from the china clay industry, which has significant potential for sea-borne movement of aggregates between regions. Debates of this type could also be undertaken with respect to the supply issues referred to above.

Transparency of approach

- 11.10 There are two principal reasons why the allocation of national Guidelines to the regions may be said to lack transparency. The first is that the process of making the allocation is complex and few people understand it. That is a problem not so much of transparency per se but of complexity in the subject

matter and, perhaps, the desirability of explaining it more simply. The second reason is that important parts of the base data are not available for scrutiny, thus the opportunity to explore the effect of varying the assumptions is not available to interested parties. There is a lack of transparency here which would be rectified by the publication of the data and model used and all the assumptions underlying it.

Data and technical inputs

- 11.11 The Aggregate Minerals Survey every four years provides valuable database of aggregates sales, distribution and permitted reserves. This has been built up by voluntary co-operation between MPAs and the mineral companies since a national collation of information first began in 1973. It works because all parties see the value of it. Coverage of the industry is high – probably over 95% of output – and the reliability of information provided has gradually improved over the years. This is an essential monitoring base for the MASS to work from.
- 11.12 Nonetheless, there are problems remaining, both inside and outside the Aggregate Minerals Surveys (AM Surveys). There appear to be two principal problems within the surveys and two outside it.
- (i) A small number of generally small firms persistently fail to co-operate in the supply of data. Consideration could be given to making the AM Surveys compulsory (as is the provision of data on aggregates sales for tax purposes) but the surveys would then no longer be seen as part of a shared endeavour in the sector, and might have as many drawbacks as benefits. It is recognised, however, that this is beyond the scope of this project.
 - (ii) Information on the destination of aggregates, and therefore on consumption by region, may not be particularly accurate (though the AM Surveys are the only source of this vital information). To some extent this is because mineral companies simply do not know where some of the mineral goes, notably that collected by independent hauliers. This, however, is a small proportion of sales and can usually be assumed to be used fairly locally. More important is the uncertainty surrounding final destinations as distinct from intermediate destinations. Aggregate may be sent to a concrete pipe making plant or a bagging plant, with the onward distribution of those products to much wider markets. The destination will probably nonetheless be specified on the AM Survey form as the location of the processing plant, not the ultimate destinations. With large quantities of aggregates used to make concrete products, and substantial amounts also finding their way to major DIY and trade chains around the country, there is a distinct likelihood that the actual distribution pattern departs from that recorded in the AM Surveys, but the margin of error is not known.
 - (iii) The principal difficulty is understanding the pattern of supply and distribution of aggregates which falls outside the scope of the AM Survey. DCLG commissions surveys from time to time of the arisings

of construction and demolition wastes and of secondary aggregates. These have proved less reliable than the AM Surveys, with much wider margins of error attached to the findings. This is often because the businesses involved, and their locations, are more dispersed, more ephemeral and simply less mainstream than the aggregates companies who respond to AM Surveys. There is a need to try to build up the same level of support for monitoring in this sector as has already been achieved in the primary aggregates sector, and to establish more inherently reliable monitoring methods. This would improve the information base for making regional aggregates allocations.

- (iv) Other kinds of aggregates supply may not be monitored at all, even if of some cumulative significance. In particular the recycling of asphalt road surface planings has slipped through the net, with no survey to inform the regional aggregates allocations since 1991. A review is needed of such 'other' sources of aggregates and arrangements needed to monitor their contributions on an ongoing basis, commensurate with their contribution to meeting overall needs. This is especially desirable if there is any regional differentiation in the availability or use of such alternative sources of aggregate.

Level of spatial definition

- 11.13 There are local problems of spatial definition. For example, sand and gravel travels short distances from the Avon valley in Hampshire to the Bournemouth/Poole conurbation and from the Idle valley in Nottinghamshire into South Yorkshire and Wakefield. These cross regional boundary movements are recorded as such, but are essentially local markets. In an ideal monitoring world, boundaries would be drawn so that these movements counted as local rather than inter-regional (and therefore notionally 'strategic') movements. Boundaries could in theory be redrawn to achieve this across the country (and indeed there is more of an opportunity to do this given the Government's move to abolish the regional planning unit).
- 11.14 There are also more strategic problems of spatial definition. The pattern of aggregates supply and demand in Kent has virtually no bearing on the pattern in Oxfordshire, nor does the pattern in Cornwall affect that in Gloucestershire, yet each pair is in the same region. The London region, on the other hand, apparently neglects the substantial amount of aggregate dispatched to meet its needs from adjacent counties like Surrey and Hertfordshire (in the South East and East of England respectively). Boundaries could in theory likewise be redrawn to avoid such inconsistencies across the country.
- 11.15 Boundaries need not be drawn to follow administrative units but around functional areas to resolve these kinds of problems. These are familiar in planning from topics such as river catchments, housing markets and travel-to-work. Even aggregates planning used to be monitored and planned on this basis, through 'service areas' set up after the Waters Committee in the 1950s and sustained until the 1970s. At that time most aggregates travelled short distances to local markets, and the catchment areas of the demand centres

did not overlap much. Over time the merit of this approach diminished as aggregates travelled longer distances, the industry concentrated into larger operational units, and greater flexibility arose in the pattern of supply. Also of key importance was the disbenefit of functional areas which did not follow administrative boundaries: data was often difficult to collect and use other than by local authority area, and co-ordinated planning could be difficult across boundaries to sustain the pattern of supply from an individual 'service area'. County boundaries became a much more manageable basis for aggregates planning, and largely remain so today.

11.16 The intention to abolish regional planning and all the institutional apparatus which accompanies it provides an opportunity to revisit the administration of aggregates planning on a 'larger than local' basis but not as large as the current regional units. 'Sub-national' planning for aggregates would benefit from a reassessment of planning units, to match strategic functional units better to the administrative boundaries of MPAs. The resulting number of new units may be greater than the existing nine standard regions, but not so large that:

- the national allocations to them become numerically unwieldy;
- inter-area flows assume much greater importance than at present;
- the collation of information, forecasts and other statistical requirements becomes difficult;
- the administrative burden of additional Aggregates Working Parties becomes unwieldy.

Extent of stakeholder engagement

11.17 The allocation of the Guidelines to regions is an entirely technical process. The only purpose of stakeholder engagement is to establish whether the technical approach has been carried out properly. If, as is suggested, the process of making allocations to the regions were to be founded on a more widely-established evidence base, then judgements would be needed about the weight to be afforded to different elements of the evidence base. Stakeholder engagement on the substance of policy would then have a more meaningful purpose and be more desirable.

12 Conclusions and Recommendations

CONCLUSIONS

- 12.1 This study has looked in detail at the long-established component of mineral planning in England to apportion the national aggregate demand forecast to regions and sub-regions. This forms a central part of MASS, the overall aim of which is to ensure a steady and adequate supply of raw materials to the construction industry. Particular attention has been paid to the consideration of environmental issues in apportionment processes, prompted in part by the efforts of some regions to implement more transparent methodologies which place explicit emphasis on environmental implications.
- 12.2 The methods used for the national demand forecast and the apportionment of the national figure to the nine English regions generally reflect the key assumption that future patterns of supply will mirror the recent past, notably imports from Wales, inter-regional movements and the proportions of regional supply from crushed rock, land-won sand and gravel and marine dredged sand and gravel. There is only limited environmental policy input to this process beyond the priority given to the use of alternative aggregates before primary aggregates and to encourage the use of marine dredged aggregates to the extent that environmentally acceptable sources can be identified and exploited. That said, it is important to recognise that past patterns of supply reflect planning and environmental constraints applied at lower tiers of the planning system (i.e. through development plans and the development management process) and thus already have an 'in-built' environmental policy component.
- 12.3 Sub-regional apportionment processes are more varied, and in recent years some regions have experimented with new ways of apportioning aggregates between MPAs or groups of MPAs. These experiments have been driven by a desire to be more transparent and pay greater attention to environmental implications alongside past patterns of supply at the point at which sub-regional apportionments are agreed. There is little doubt that historically, apportionments based on past patterns of supply have served to achieve the objective of ensuring a steady and adequate supply of aggregates. But there is growing concern that this will not be the case in the future as permitted reserves diminish, placing greater pressure on areas where hitherto extraction has not been permitted, and as society's desire to afford greater protection to important environmental assets grows.
- 12.4 In practice, it is probably fair to conclude that the success of these experiments has been patchy. While some regions have made significant progress in applying new methodologies, making the factors which might influence apportionments more transparent and evidence-based, more often than not the resulting options have fallen foul of the decision-making process. This has been further complicated by the Coalition Government's intention to abolish the regional tier of Government in England and revoke Regional Spatial Strategies. So while MASS remains, there is now considerable uncertainty around the institutional framework in place to ensure that sub-regional apportionments are implemented.

12.5 In many respects however, it is this current uncertainty which provides the strongest justification for aggregate working parties (however geographically defined) to adopt an open and transparent methodology for apportioning aggregates between constituent mineral planning authorities or some other spatial planning unit. The same could be said for the process by which the national demand forecast figure is apportioned to the regions. This will help to ensure a clear audit trail of all decisions made which would be available for scrutiny as required. It is with this in mind that the recommendations for an apportionment toolkit have been formulated.

RECOMMENDATIONS

12.6 It is evident from the various approaches used or trialled to apportion aggregates in different parts of the country that they reflect particular local circumstances – geology, past patterns of supply, the composition of aggregate working parties, etc. Thus rather than formulating a prescribed one size fits all methodology, a toolkit for apportionment is recommended. This comprises three key components: local demand, local supply and environmental issues.

12.7 It is recommended that:

- An accurate assessment of local demand for aggregates within the aggregate working party area is required, as understanding future demand helps establish how much primary aggregate will be needed to supply the construction industry and where building materials are likely to be required in large quantities. This can be used to influence the distance over which aggregates may be transported from areas of supply, thereby helping to reduce emissions from transport.
- An accurate assessment of the quality and spatial extent of primary aggregates available for extraction is required to ensure any apportionment options are realistic. This is likely to require the BGS Mineral Resource Data to be supplemented with local knowledge, drawn from pooling information available from MPAs and industry on the extent, quality and workability of aggregate resources.
- The consideration of environmental issues should be a central part of an apportionment methodology, and the resulting apportionment options. The range of environmental considerations that could be included is wide, and it will be for aggregate working parties to determine which ones are most relevant to their particular local circumstances. In doing so, it will be important to draw a distinction between those which lend themselves to a strategic-level apportionment (e.g. the presence of nationally designated landscapes), and those which are better dealt with at the minerals development framework level by individual MPAs (e.g. impacts on local environmental designations).

12.8 Any methodology should also display five essential characteristics:

- Transparency of approach (i.e. it should be possible for all stakeholders to see and understand the data inputs, assumptions made and outputs).

- Data and technical inputs to be as robust as possible without requiring excessive cost of new data provision.
- Level of spatial definition (i.e. it should be possible for all stakeholders to identify the planning unit to which a local apportionment applies).
- Extent of stakeholder involvement (i.e. there should be adequate stakeholder input to the apportionment process).
- Consideration of alternatives (i.e. realistic and achievable alternatives at each stage of the apportionment methodology should be considered).

12.9 The output from the apportionment methodology should be a set of apportionment options divided between the relevant planning unit(s), which can form the basis of public consultation, leading to the choice of a preferred strategy for inclusion in the relevant development plan(s).

Land Use Consultants

16th March 2011

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Appendix I

List of Stakeholder Workshop Attendees

Appendix 1: List of Stakeholder Workshop Attendees

Stakeholder Workshop with Mineral Planning Authority Representatives

Date: 26th October 2010

Attendees:

Name	Organisation
Peter Day	Oxfordshire County Council
David Palk	Suffolk County Council
Richard Read	Hampshire County Council
Chris Waite	London Regional Aggregate Working Party (RAWP)
Paul Wilcox	Staffordshire County Council

Stakeholder Workshop with Industry Representatives

Date: 28th October 2010

Attendees:

Name	Organisation
Ken Hobden	Mineral Products Association
Peter Huxtable	British Aggregates Association

Project Stakeholder Workshop

Date: 12th January 2011

Attendees:

Name	Organisation
Lucy Binnie	On behalf of British Aggregates Association member Martin Layer, Smiths of Bletchington
Steve Bowley	For British Aggregates Association member Steve Cole, Raymond Brown Minerals & Recycling
Ruth Chambers	Campaign for National Parks
Peter Day	Oxfordshire County Council
Tim Deal	Lafarge
Colin D'Oyley	Breedon Holdings / Mineral Products Association or British Aggregates Association

Richard Ford	Bretts
Ken Hobden	Mineral Products Association
Jon Humble	English Heritage
Peter Huxtable	British Aggregates Association
Andrew Lipinski	Department for Communities and Local Government
Hugh Lucas	Aggregate Industries and Chair of Mineral Products Association Environment and Mineral Planning Committee
David Palk	Suffolk County Council
Mark Plummer	Department for Communities and Local Government (Part)
Richard Read	Hampshire County Council
Hannah Townley	Natural England
Chris Waite	Chris Waite Planning / London RAWP
Roger Wand	Department for Communities and Local Government
Paul Wilcox	Staffordshire County Council
Lucy Yates	Department for Communities and Local Government

Appendix 2

National Forecast and Regional Apportionment Methodology Review Table

Appendix 2: National Forecast and Regional Apportionment Methodology Review Table

Table 1: Regional Apportionment Methodology in England

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>Environmental issues are only incorporated by proxy. The Government strongly prioritises the use of alternative aggregates in place of primary sources. This is based on the environmental advantages of that type of material, in effect recognising the distinct merit, on balance, for a basket of environmental interests. Likewise, some preference is given to marine aggregates over land-won aggregates on a similar basis. The precise choice of target for alternative and marine aggregates is not explained, but is a matter of judgement by the Government.</p> <p>No consideration is given directly to any particular environmental issue.</p>
B	Degree to which reasonable alternative spatial options are	Method considers a full set of reasonable alternative apportionment options	<p>The apportionment methodology used generates a single apportionment option. The same methodology has been used over the years, with changes only made to the finer details.</p> <p>The process of regional allocation is conservative, for example, the most recent four-yearly</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	considered	<p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	<p>Aggregate Minerals Survey is used as the basis for following factors, with no other options considered:</p> <ul style="list-style-type: none"> the ratio of production to consumption within a region will remain unchanged from that identified by the most recent four-yearly Aggregate Minerals Survey; the market shares of land-won crushed rock and sand and gravel and of marine-dredged aggregates broadly reflect their shares at the last Aggregate Minerals Survey; inter-regional movements of aggregates are assumed to remain fixed at the rates in the most recent Aggregate Minerals Survey; imports from Wales (and exports beyond England) are assumed to be the same for the whole Guidelines period as they were in the most recent Aggregate Minerals Survey. <p>The draft Guidelines, and generally speaking the published ones, therefore do not take into account any change in the ability (or 'environmental capacity') of regions to contribute to supply in future compared with recent experience. Change in this respect comes about through market forces despite the Guidelines rather than because of them, and can only be taken into account – to the extent that it has already happened – in the next round of the process.</p>
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are</p>	<p>The method used to generate the allocations is so complex that it is widely regarded as a 'black box'. The principles of the method are published, but the model into which the data are fed is not readily available for practical use. The report on the methodology explains where assumptions have been made, but on many important points not what those are.</p> <p>The method used to produce draft Guidelines is mechanical, based largely on quantitative analysis. Qualitative analysis does enter the process in the selection of target levels for</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<p>alternative and marine-dredged aggregates (at the start of the process) and in the scope for making amendments to reflect comments on the draft Guidelines (at the end of the process), though the adjustments resulting from the latter have been modest. Overall it would be unrealistic to characterise the approach as involving qualitative analysis.</p> <p>An attempt by the South East England Regional Assembly to explore the reliability of the allocation made to the region by reviewing the model failed when it became clear that “CLG advise that key parts of the information needed to do this are confidential. This has also affected certain other parts of the analysis, notably assessing the impact on aggregates demand caused by the introduction of the Aggregates Levy in April 2002” (<i>Review of the basis for the National and Regional Guidelines for Aggregates Provision 2005-2020 as applied to South East England</i>, January 2009, SEERA, paragraph 1.7).</p>
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>Geological and environmental data are not used. Monitoring data from the four-yearly Aggregate Minerals Surveys is used as input to the allocations process and is readily available. However, other extensive data sets are used to develop the regional demand estimates which underpin the allocations, including: regional construction GVA data by sector and trend data on the aggregates intensity of expenditure on construction by sector. Data availability here is poor. Consultants are employed to generate the demand forecasts on which the method relies, and those in turn depend upon using forecasts for the construction industry which are privately held by Cambridge Economics and have to be purchased for use (e.g. to evaluate alternative assumptions).</p>
E	Level of spatial definition of outputs	Based on MPA boundaries (or	The output of the allocations is tied to the standard regions. This in turn enables sub-regional apportionment to MPAs. The arrangement partly reflects the availability of the

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	<p>necessary data sets at the regional level, but also deliberately assists the application of MASS by providing guidance convenient for application by MPAs and the planning system generally.</p>
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<p>The preparation of the Guidelines, which includes the regional allocations, is assisted by the Regional Aggregates Working Parties and their National Co-ordinating Group. These are partnership bodies which provide for representation of the principal stakeholder interests. However, participating in the complex MASS process is very time-consuming (especially for non-professional stakeholders), and the difficulty of changing the outcome of an essentially technical method can discourage engagement.</p> <p>There is additionally public consultation on the draft Guidelines, though that level of engagement is very different from stakeholder involvement in the preparation process, and the submissions made at that stage can be difficult to assimilate into the process.</p>

Appendix 3

Sub-regional Apportionment Methodology Review Tables

Appendix 3: Sub-regional Apportionment Methodology Review Tables

SOUTH EAST

- I. SEERA commissioned LUC in 2007 to develop a revised methodology for the sub-regional apportionment of land-won primary aggregates (including crushed rock) having regard to sustainability and practical factors. Those identified at the time were (in no order of priority):
 - i Population/household growth projections (as a proxy for demand)
 - ii Patterns of current supply
 - iii Aggregate resources in each sub-region
 - iv National and International environmental designations, and planning or policy designations including Green belt and degree of constraint on resources
 - v The proximity to, and feasibility of using, sustainable transport modes (rail and water)
 - vi Other planning, economic and practicability considerations.
2. The resulting revised methodology was developed in association with the project Steering Group consisting of representatives from the South East MPAs, SEERA, the South East England Regional Aggregate Working Party (SEERAWP), CLG, the Environment Agency, Natural England, English Heritage and Industry. The methodology underwent four stages of development:
3. Stage 1: An initial set of proposed criteria (key considerations that might influence the supply and use of primary aggregates) were presented to the Steering Group as a draft methodology for discussion. These were the location of mineral resources, patterns of past use, development pressure, population/households, sustainable transport, contracts and patterns of movement and environmental constraints.

4. Stage 2: Responding to comments from the Steering Group, revised criteria and datasets were presented to the Steering Group as a briefing note for discussion. A final set of criteria for inclusion in the apportionment methodology were agreed with the Steering Group, combining initial considerations into four criteria:
 - Criterion 1: Construction Demand (with a ratio of 1:9 for 1a and 1b)
 - Criterion 1a: Future (Housing provision)
 - Criterion 1b: Current (Existing population)
 - Criterion 2: Past Sales
 - Criterion 3: Unsterilised resource outside of international designations (+250m buffer)
 - Criterion 4: Unsterilised resource outside of international designations (+250m buffer) and outside of national designations.
5. Stage 3: The selected criteria were then weighted in varying amounts to create potential options for the apportionment. Therefore, all options considered all criteria, but to varying degrees. The initial options were discussed and revised with the Steering Group.
6. Stage 4: Six final options were agreed with the Steering Group meeting:
 - Option A: weighted towards on sales – referred to as ‘Past sales’.
 - Option B: weighted towards supply i.e. unsterilised resources outside of international designations (+250m buffer) – referred to as ‘Resource’.
 - Option C: weighted towards construction demand – referred to as ‘Demand’.
 - Option D: weighted towards unsterilised resource outside of international designations (+250m buffer) and outside of national designations – referred to as ‘Environmental’.
 - Option E: evenly weighted between demand and resources, but with more emphasis on demand arising from existing population – referred to as ‘Demand and resource’.
 - Option F: evenly weighted between all four criteria – referred to as ‘Equal weighting’.

7. The Steering Group then made recommendations to SEERAWP on the preferred option(s), who then had the opportunity to review the options and recommend a final option to the Regional Assembly.
8. All information about the apportionment methodology used for the South East region has been taken from the report prepared for the South East of England Regional Assembly by Land Use Consultants¹.

Table I: South East

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>International and national nature conservation, landscape and cultural heritage designations were included in the apportionment methodology, using GIS layers to calculate the area of 'unconstrained' resource outside of these designations. See also Table 2 below for coverage of the SEA Directive topics.</p> <p>Reasoned justification was provided as to why other environmental factors were not included:</p> <ul style="list-style-type: none"> • Floodrisk zones - this type of development (i.e. primary aggregate extraction) is considered 'water compatible' - the very nature of the material means that it is mainly going to be found in floodplains; • Groundwater source protection zones - site management can overcome the potential constraint; • Safeguarding around aerodromes – site management can overcome the potential constraint;

¹ Primary Aggregates Sub-regional Apportionment in South East England. Final Report. Prepared for SEERA by Land Use Consultants, November 2007.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<ul style="list-style-type: none"> Green Belt – mineral extraction is an acceptable use in the Green Belt; Local designations and non-spatial designations such as habitats of Principal Importance – it was not seen as appropriate at this level (sub-regional) to consider local and non-spatial environmental designations as these should be assessed strategically by the MPA as part of their environmental responsibilities in line with their regional BAP targets, PPS9 and the relevant South East Plan policies. <p>In terms of taking the impacts of transport of aggregates into account, the following justification was provided: “Apportioning on the basis of density of sustainable transport links would have to be treated with some caution. For example, existing sustainable transport modes do not necessarily link source with demand. In addition, an area could have lots of depots but no resource because material is imported. There is at present very little transport of aggregates by water or rail from internal sources. Thus, any apportionment which relies heavily on sustainable transport may signal the need for significant investment in new and / or upgraded transport facilities. The Steering Group agreed that sustainable transport should be omitted as a criterion in the sub-regional apportionment. However, it was recognised that the construction demand criteria will encourage supplies in close proximity to demand.”</p>
B	Degree to which reasonable alternative spatial options are considered	<p>Method considers a full set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p>	<p>An iterative process was undertaken involving a Steering Group consisting of representatives from the South East MPAs, SEERA, the South East England Regional Aggregate Working Party (SEERAWP), CLG, the Environment Agency, Natural England, English Heritage and Industry. The development of options went through four stages of development:</p> <ul style="list-style-type: none"> Stage 1: Initial Set of Proposed Criteria was presented to the Steering Group as a draft

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method based on one apportionment option	<p>methodology for discussion at a meeting on 15th May 2007.</p> <ul style="list-style-type: none"> • Stage 2: Revised Criteria and datasets used were presented to the Steering Group as a briefing note for discussion at the meeting on 14th June 2007. • Stage 3: Development of Options arose from discussion at the Steering Group meeting on 14th June 2007. • Stage 4: Revised Options for appraisal were agreed at the Steering Group meeting on 19th July 2007. <p>Six alternative spatial options were developed, covering a range of criteria agreed by the Steering Group to influence the supply and use of primary aggregates:</p> <ul style="list-style-type: none"> • Option A: 'Past sales' • Option B: 'Resource' • Option C: 'Demand' • Option D: 'Environmental' • Option E: 'Demand and resource' • Option F: 'Equal weighting'
C	Transparency of approach	Method followed and judgements made are explicit and based on best available evidence.	<p>The apportionment options were generated using quantitative and spatial (GIS) data to quantify the different criteria agreed to influence the apportionment:</p> <ul style="list-style-type: none"> • Criterion I: Construction Demand

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	<p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<ul style="list-style-type: none"> • Criterion 1a: Future (Data = Housing provision figures from SE Plan) • Criterion 1b: Current (Data = Existing population figures from ONS) • Criterion 2: Past Sales (Data = Past sales figures from Aggregates Monitoring Reports) • Criterion 3: Unsterilised resource outside of international designations (+250m buffer) (Data = GIS layers showing spatial extent of geological resource and international designations from which area could be calculated) • Criterion 4: Unsterilised resource outside of international designations (+250m buffer) and outside of national designations (Data = GIS layers showing spatial extent of geological resource and international and national designations from which area could be calculated) <p>The six alternative options were created by feeding the datasets into a Microsoft Excel based database, and using multi-criteria analysis, applying weightings to each criterion to reflect the strength of influence of each criterion:</p> <ul style="list-style-type: none"> • Option A: weighted 70% on sales, and 10% each for other criteria (with a 9:1 ratio² for current : future construction demand – referred to as 'Past sales') • Option B: weighted 70% on supply i.e. unsterilised resources outside of international designations (+250m buffer), and 10% each for other criteria (with a 9:1 ratio for current : future construction demand – referred to as 'Resource') • Option C: weighted 70% on construction demand (with a 9:1 ratio for current : future

² The minerals industry representatives on the Steering Group advised that anecdotally, approximately 90% of the demand for aggregates for construction is for existing redevelopment, and only 10% is for new build (i.e. future demand).

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<p>construction demand), and 10% each for other criteria – referred to as ‘Demand’</p> <ul style="list-style-type: none"> • Option D: weighted 70% on the unsterilised resource outside of international designations (+250m buffer) and outside of national designations and 10% on each other criteria (with a 9:1 ratio for current : future construction demand) – referred to as ‘Environmental’ • Option E: evenly weighted between demand and resources, but with more emphasis on demand arising from existing population. 50% on demand (40% construction demand in 9:1 ratio; and 10% on sales) and 50% on supply (40% on unsterilised resources outside of international designations (+250m buffer) and 10% on the unsterilised resource outside of international designations (+250m buffer) and outside of national designations) – referred to as ‘Demand and resource’ • Option F: evenly weighted between all 4 criteria (25% each) – referred to as ‘Equal weighting’
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>The apportionment method requires technical expertise and software in relation to numerical data analysis using Excel, and spatial data analysis using Geographical Information Systems.</p> <p>The basic method is relatively simple, however, collation and analysis of the datasets for each criterion is more complex. Despite this, with the necessary expertise and software, and following the method described in detail in the Final Report, the method could be replicated relatively easily.</p> <p>Data used to develop the apportionment options is summarised under criterion 3 above. All data sources, interpretation and limitations for each dataset were described in Chapter 2 of the Final Report. Each dataset had its own complexities, but could be obtained from</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<p>publicly available data sources for the most part (except the BGS geological data).</p> <p>The main limitation in data was that the <u>volume and viability</u> of geological resource could not easily be calculated. The GIS data were supplied as layers of soft sand, sharp sand and crushed (hard) rock from the BGS study³ undertaken for SEERA. The BGS data was considered by the Steering Group to have limitations as it did not show local differences such as less workable areas of mineral resource.</p> <p>There was discussion that the BGS geological data should be supplemented with locally based evidence and liaison with individual MPAs. However, it was agreed that while this may be possible in some cases, comprehensive and consistent supplementary data for the entire region was not available, thus the BGS data was considered to be the most reliable source of information at the regional scale.</p>
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The level of spatial definition of the apportionment options generated was per MPA / group of MPAs, and no site-specific analysis was carried out.
F	Extent of	Involves full range of	As described above under criterion 2, a Steering Group consisting of representatives from

³ South East England Regional Assembly: South East Plan – Review of Mineral Supply and Demand. Economic Minerals Programme Commissioned Report CR/06/147. British Geological Society 2006.

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
stakeholder engagement	<p>stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<p>the full range of relevant stakeholder interests (the South East MPAs, SEERA, the South East England Regional Aggregate Working Party (SEERAWP), CLG, the Environment Agency, Natural England, English Heritage and minerals industry) met regularly to discuss the approach to the apportionment methodology and to influence the development of options coming out of the method.</p> <p>In addition, workshops were held with the full SEERAWP to discuss progress and findings from the study, and a sub-group of the three statutory agencies met to input to the SA and HRA being undertaken alongside development of the apportionment options.</p>

LONDON

9. The London Plan (Consolidated with Alterations since 2004), on the recommendation of the London Aggregates Working Party (LAWP) provides for 1 million tonnes per annum (mtpa) regional apportionment for London to be split equally (0.5mtpa each) between East London (specifically the London Boroughs of Havering and Redbridge) and West London (London Boroughs of Ealing, Hillingdon, Hounslow and Richmond-upon-Thames). This is lower than the 1.1mtpa in the 2001-2016 National Guidelines for Aggregates Provision in recognition that marine aggregate supplies to London exceeded the guideline assumption. The sub-regional apportionments for East and West London were based on the known viable resource in the London region from the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction.
10. The 2005-2020 National Guidelines for Aggregates Provision again set 1.1mtpa for London, but the London Plan retained a figure of 1mtpa. However, following a report to LAWP on a sub group meeting between industry and the key four London Boroughs, the GLA has proposed Minor Alterations to the Draft Replacement London Plan suggesting that the London apportionment should be reduced to 700,000 tonnes per annum, and that specific figures are set for four London Boroughs. London Boroughs of Hillingdon and Havering are to make provision for sub-regional apportionments of 250,000 tonnes per annum, with Hounslow and Redbridge receiving lower sub-regional apportionments of 100,000 tonnes per annum.
11. A LAWP meeting in September considered these proposed Minor Alterations. The Boroughs favour them as more realistic for the London Plan period to 2030, reflecting the extent of the aggregate resource and constraints, and also setting a clear target for the four Boroughs (with any extraction in other Boroughs regarded as a bonus). The minerals industry oppose them as having insufficient environmental assessment, and that the right procedure is for the 1.1 mtpa in the Guidelines to be adopted, and sub-regional apportionment for each Borough should be tested at the Minerals Development Plan Documents public enquiry stage.
12. In undertaking this review it is acknowledged that the situation in London is unique amongst the English regions, in that the constrained nature of the remaining resource restricts the potential for alternative spatial options for aggregates extraction to be identified.

Table 2: London

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>The current apportionment is based on the location of the viable resource in the London region, the basis for which is the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction. However, further information on the range of environmental issues considered is unavailable, therefore the evaluation against this criterion is uncertain.</p>
B	Degree to which reasonable alternative spatial options are considered	<p>Method considers a full set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p>	<p>Although the apportionment method considered only one apportionment option, the London region is unique in that constrained nature of the remaining resource in the region restricts the potential for alternative spatial options to be considered.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method based on one apportionment option	
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	The method employed used existing quantitative data on the available resource (supplied by the industry), with an element of qualitative analysis by the MPAs and LAWP. An explanation of the qualitative analysis is not available in a written document.
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely</p>	The methodology used in the apportionment process involved the combined knowledge of industry and MPAs with regard to available resources and constraints on extraction, therefore could be replicated should this knowledge be drawn upon.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		to be readily available.	
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The output of the sub-regional apportionment was based on MPA boundaries, providing sub-regional apportionments to the London Boroughs of Hillingdon, Hounslow, Havering and Redbridge.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	The LAWP includes representatives of MPAs, the Greater London Authority, industry and the Crown Estate. Key stakeholders not involved include Natural England, the Environment Agency and English Heritage.

EAST OF ENGLAND

13. In response to the National Guidelines for Aggregates Provision, the East of England RAWP agreed that the sub-regional apportionment should be based on historical data, specifically an average of sales over the last 10 years. The EERAWP did consider the approaches being taken in other regions such as the South East, but took the view that the current apportionment was effective and therefore no change was required.
14. Using this approach, the 2005-2020 Guidelines were apportioned to the six MPAs/groups of MPAs (Bedfordshire Historic County; Cambridgeshire and Peterborough; Essex, Southend and Thurrock; Hertfordshire; Norfolk; and, Suffolk) and the figures included in the approved draft East of England Plan (March 2010), and reviewed through the SA process.

Table 3: East of England

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very</p>	The EERAWP agreed that the sub-regional apportionment should be based on historical data, specifically an average of sales over the last 10 years. Environmental issues were not considered in the apportionment process.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		partial consideration of environmental issues and no clear justification for this.	
B	Degree to which reasonable alternative spatial options are considered	<p>Method considers a full set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	Only one option was considered – that based on historical data.
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	Quantitative analysis of past sales (the average over the last 10 years) was undertaken and used to calculate the revised sub-regional apportionment.
D	Data and technical	Method requires limited	The mathematics behind the methodology are simple and could be replicated easily.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	requirements (including level of definition of geological data required)	<p>technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	The methodology used relies on the provision of sales data by industry. This information is collated by the RAWP annually to feed into the annual monitoring reports, however, due to confidentiality issues, some data may not be available.
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The sub-regional apportionment is provided to MPAs and groups of MPAs: Bedfordshire Historic County; Cambridgeshire and Peterborough; Essex, Southend and Thurrock; Hertfordshire; Norfolk; and, Suffolk.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder</p>	<p>The stakeholders involved were the RAWP – this is comprised of:</p> <ul style="list-style-type: none"> • MPAs (Essex CC, Norfolk CC, Cambridgeshire CC, Peterborough CC, Suffolk CC and Hertfordshire CC, Central Bedfordshire Council). • Industry (Bretts, Tarmac, Hanson, LaFarge, Cemex, J J Prior). • Minerals Planning Association, British Aggregates Association. • SEERAWP and LAWP. • EERA.

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	<p>involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<ul style="list-style-type: none"> • Environment Agency. • GO-East. • CLG <p>The only key stakeholders not involved are the other statutory environmental organisations (English Heritage and Natural England).</p>

SOUTH WEST

15. South West Councils (SWC) appointed Capita Symonds Limited (CSL) to develop three scenarios for undertaking the sub regional apportionment of aggregates in the region:
 - Scenario 1) **A status quo scenario**: continuation of pro rata proportional share to supplies that has previously been used in the region;
 - Scenario 2) **An environmental scenario**: meeting guideline requirements whilst minimising exploitation of aggregate resources in environmentally sensitive areas; and,
 - Scenario 3) **A known markets scenario**: looking at markets in the South West and possibly beyond and investigating a sub-regional approach to supply based upon proximity to local aggregate resource areas, including how markets could be supplied and potential for sourcing aggregates from outside shortfall areas.
16. Scenarios 2 and 3 were intended to be illustrative examples of the many options for modifying the existing, historically influenced pattern of supply, and in many respects they represent extremes in the range of options available. The intention was that, by looking at these extremes, consideration could be given to the desirability (or otherwise) of moving away from the existing approach to apportionment, as represented by Scenario 1. However, the practicalities of developing Scenario 3 and difficulties with the suggested methodology led to this option being dropped from further consideration.
17. SWC, with the Mineral Planning Authorities (MPAs), resolved to undertake the sub-regional apportionment process on a resource block basis rather than by individual or groups of MPAs. The resource blocks reflect the various sources of supply in the South West, divided into groups based on a combination of technical similarity and geographical location. For example, Resource Block B is Carboniferous & Devonian Limestone, Somerset and Devon. This allowed the identification of specific types of aggregate in certain locations that are facing a shortfall in permitted reserves, alongside consideration of which alternative sources of aggregate could be used should substitution be seen as an appropriate way forward.
18. The common basis for the Scenarios was the identification of resource blocks facing a shortfall in permitted reserves. Such shortfalls were then investigated to establish whether, under each Scenario, there would be difficulties of finding new permitted reserves to meet the shortfall requirements. As such, the actual apportionment of the regional guideline figure to each resource block was undertaken prior to consideration of the Scenarios and therefore is common to all Scenarios. The apportionment itself was undertaken on the basis of the percentage contribution of each resource block to the regional production of crushed rock and sand & gravel (based on an

average of 2001 and 2008 production figures). The percentage contributions were then applied to the regional apportionment figures to establish the total apportionment required from each resource block.

Table 4: South West

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this.</p>	<p>In developing Scenario 2, the following ‘environmentally sensitive’ areas were taken into account: SSSIs, SACs, SPAs, Ramsar sites, AONBs, NNRs, Scheduled Ancient Monuments, Registered Battlefields, World Heritage Sites, Heritage Coast, National Parks, Registered Parks and Gardens, and Groundwater Source Protection Zone 1.</p> <p>However, development of the ‘environmental scenario’ did not consider issues such as population and human health, soils, air pollution and climatic factors, with no clear justification for this.</p> <p>In addition, high level environmental issues were taken into account during the development of Scenario 1. For example, the deliverability of this Scenario was considered by examining the availability of unconstrained resources within shortfall areas. In determining the unconstrained resource the spatial distribution of known environmental constraints and existing built-up areas were taken into account. The environmental constraints considered are: Ramsar sites, SPAs, SACs, SSSIs, NNRs, AONBs, National Parks, World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments and Registered Battlefields. SSTCs/Main Settlement Areas were used as a proxy for existing built-up areas. Scenario 3, should it have been developed in full, would have taken air pollution and climatic factors into account indirectly, by reducing the transport distances where possible.</p>
B	Degree to which reasonable alternative spatial options are	Method considers a full set of reasonable alternative apportionment options	The three scenarios were developed based on the extremes of each factor considered i.e. the environmental scenario took no account of other influences such as current patterns of extraction or areas of demand. However, the use of these extremes was intended to inform a decision on the desirability (or otherwise) of moving away from the existing

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	considered	<p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	approach to apportionment.
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	Detailed calculations were undertaken to establish the ability of each resource block to meet the South West regional apportionment. GIS overlays were then used to establish whether the shortfalls identified could be met under each Scenario, for example, to establish the extent of the resource located outside the selected environmentally sensitive areas. The calculations are explained in detail, together with reasoning and data sources.
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p>	<p>Scenario development was based on an excel spreadsheet drawing on a number of information sources, followed by a GIS mapping exercise for the purpose of Scenario 2. The detailed explanation of the calculations and data sources would help if the methodology was to be replicated.</p> <p>The location of the resource blocks is based on geological data provided by the BGS (<i>Resource Information for Development Plans</i> data, commissioned by CLG, derived from BGS 1:50,000 scale digital geological mapping), with a degree of interpretation and assumptions</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method is technically complex and data unlikely to be readily available.	<p>regarding the quality of the resource. Information on permitted reserves was provided by industry. Environmental designations are readily available datasets.</p> <p>The geological mapping used does not provide any guarantee regarding the quality or thickness of the resources. Nor does it purport to show the economic viability or environmental acceptability of working the resources. In some areas, where the BGS resource maps were found to exclude formations which are known to have been exploited for aggregates, either now or in the past, additional digital mapping information was obtained by SWC from the BGS.</p>
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource with some site level discussions.</p> <p>Includes site-specific analysis</p>	<p>The resource blocks were identified by grouping existing mineral workings. These were then related to geological units in the BGS mapping information provided. Discussion of the ability of resource blocks with a shortfall of permitted reserves to meet their apportionment was undertaken at the site level in some instances. Whilst this added more certainty it may not be appropriate at the regional level. Resource blocks were not always based on individual MPA boundaries, meaning that further apportionment work would need to be carried out at the sub-regional level.</p>
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited</p>	<p>SWC convened the Minerals Review Group to input into the project. The Group included representatives of</p> <ul style="list-style-type: none"> • Aggregate Industries • Campaign to Protect Rural England • CEMEX • Cornwall Council • Dartmoor National Park

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	<p>stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<ul style="list-style-type: none"> • Devon County Council • Dorset County Council • English Heritage • Environment Agency • Exmoor National Park • Gloucestershire County Council • Hills Group • the Minerals Products Association • Natural England • North Somerset Council • Somerset County Council • South Gloucestershire Council • South West Councils • South West Regional Aggregates Working Party • Tarmac • Wiltshire Council

EAST MIDLANDS

19. The apportionment methodology for the East Midlands region was developed and implemented by the East Midlands Aggregates Working Party is described in the document entitled Sub-regional Apportionment 2009⁴.
20. The East Midlands RAWP used an iterative apportionment methodology centred on refining an initial sub-regional apportionment based on past sales through consideration of key policy areas and issues. Although separate sub-regional apportionment scenarios or options were not produced in parallel for comparison and/or assessment, the key policy areas and issues considered during the iterative process covered many environmental issues, in effect producing an alternative sub-regional apportionment through each iteration.
21. The methodology followed seven steps:
 1. Determine whether the apportionment for the East Midlands from the National and Regional Guidelines is fair and reasonable by comparing annual average Guideline figure for England and for the East Midlands with past production (2001 – 2007).
 2. If the apportionment is considered to be unfair, discuss with DCLG; if considered to be fair calculate average percentage contributions to aggregate production by MPA over the last seven years.
 3. Multiply the Regional Guidelines figure by average MPA percentage contributions over the last seven years, to provide a baseline sub-regional apportionment.
 4. Compare the output from Step 3 with landbanks to calculate any shortfalls or surpluses within each MPA.
 5. Consider whether any shortfalls or narrow-margin surpluses can be met through available resources in each MPA, or whether other relevant MPAs can meet them through permitted reserves.
 6. Address key policy areas and other issues: Reducing supplies from the Peak District National Park and Lincolnshire Wolds AONB, long term prospects for igneous rock in Leicestershire, implications for depletion of resources in the Idle Valley, long-standing issues regarding sand and gravel supply in Northamptonshire.
 7. Re-run Steps 2-5 in response to outcomes of Step 6.
22. The 2009 Guidelines were first discussed by EMAWP on 3rd August 2009, alongside a briefing paper prepared by the RAWP Secretary, which set out a proposed approach (the seven steps detailed above) and included draft statistics covering the early stages of the

⁴ Sub-regional Apportionment 2009, East Midlands Aggregates Working Party

exercise. The methodology was agreed in principle, and a number of issues highlighted for more detailed examination by a Technical Sub-Group (those listed under Step 6). The Technical Sub-Group met twice (21st September and 16th October 2009) to discuss the issues raised. Each issue was considered during these roundtable discussions, drawing on the technical expertise of the people present and collective knowledge of the problems facing the extractive industry in the region.

23. In the case of reducing supplies from the Peak District National Park (as sought after by national policy) Derbyshire County Council and the Peak District National Park Authority discussed the issue separately, and resolved that Derbyshire County Council would progressively increase its contribution to the sub-regional apportionment, taking up a progressive decrease by the Peak District National Park.
24. The issues considered in the East Midlands are fully documented in the Sub-regional Apportionment 2009 Report. The Report explains that where potential supply problems were identified, they were examined and resolved through roundtable discussions and compromise.

Table 5: East Midlands

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered Some gaps in environmental issues incorporated or partial consideration and no	General <ul style="list-style-type: none"> – The executive summary states that EMAWP do not have the capacity or remit to conduct a SA/SEA but that this will be taken into account when the SA of the Partial Review is conducted. The SA has been undertaken retrospectively, rather than forming an integral part of the apportionment methodology. – General consideration of the effects of exports to South Yorkshire on ‘environmental sustainability’. – Due to the uncertainties of theoretical permitted reserves of igneous rock in Leicestershire, it is recommended that they are accorded a national strategic status, against which the significance of other interests e.g. environment, can be weighed.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>Landscape</p> <ul style="list-style-type: none"> – Effect of lack of suitable fill material in the Nene Valley could lead to creation of a ‘water park’. – Reduced crushed rock apportionment in PDNP and consideration of effects of transporting additional aggregate across the National Park. – The need for a progressive reduction of aggregate supply from the Lincolnshire Wolds AONB. <p>Climatic factors</p> <ul style="list-style-type: none"> – Partial consideration in relation to the implications of future sand and gravel supply from the Trent Valley and Idle Valley. <p>Population</p> <ul style="list-style-type: none"> – Partial consideration in relation to implied burden of continuing to increase sand and gravel sales in Nottinghamshire <p>Environmental issues not considered within apportionment methodology</p> <ul style="list-style-type: none"> – Biodiversity, flora and fauna – Human health – Soil – Water – Air – Material assets – Cultural heritage
B	Degree to which reasonable alternative spatial options are	Method considers a full set of reasonable alternative apportionment options	Methodology is grounded in a baseline sub-regional apportionment calculated on the basis of production over the past seven years. Methodology is iterative whereby reductions or increases are considered for each MPA based on a number of policy considerations and other issues, including environmental considerations. Therefore, through these iterations,

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	considered	<p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	some alternative apportionment options have been considered.
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	Parts of the methodology are based largely on qualitative analysis. Modifications to the baseline apportionment scenario are quantified by applying a nominal percentage increase or decrease for different MPAs, based on a particular policy or issue considered. Although there is no clear consideration of different factors side-by-side to inform the development of options, the process followed and judgements made are clearly documented in the EMAWP Report, increasing the transparency of the method followed.
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p>	<p>The apportionment method is based on a mix of quantitative and requires some knowledge of minerals planning and data analysis and interpretation. However, the calculations could be easily replicated.</p> <p>The methodology requires data on past production and also draws on data and knowledge of landbanks, permitted reserves and geological resources.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method is technically complex and data unlikely to be readily available.	
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The apportionment is shown by MPA, including the Peak District National Park. No site-specific analysis was carried out, but local level issues are discussed e.g. quarries due to close or ownership constraints.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	The apportionment methodology was developed and applied by EMAWP members which comprises MPAs, industry representatives and central and regional Government representatives. The extent to which environmental bodies were involved in the process is not clear.

WEST MIDLANDS

25. All information about the apportionment methodology used for the West Midlands region has been taken from the report prepared for the West Midlands Regional Assembly by Land Use Consultants⁵, and the publicly available information on the archived West Midlands Regional Assembly website⁶.
26. Two methodologies were employed for developing sub-regional apportionment options in the West Midlands: one undertaken by the West Midlands Regional Aggregate Working Party Technical Secretariat based on past sales trends (referred to as the “WMRAWP options”); and another commissioned by the West Midlands Regional Assembly (WMRA), which sought to take account of the likely availability of materials, future patterns of development, environmental and other considerations (referred to as the “Assembly options”).
27. To initiate the development of the Assembly options it was considered that the key considerations that might influence the supply and use of primary aggregates fell into one of three categories. The first reflects demand, with the intention being to establish a reliable measure of where building materials are likely to be required in large quantities in the future. Existing population and future housing fall into this category. The second category relates to supply, reflecting the location of unsterilised resources. The third category was termed constraints, and includes those considerations that may constrain the ability of a sub-region to provide for the supply of material. Generally it is assumed that these would be environmental (nature conservation and landscape designations) and heritage constraints.
28. It was discussed that an apportionment methodology which reflected these considerations could also be designed to accommodate weighting, thereby making it possible to formulate and test different apportionment scenarios.
29. Taking the key considerations into account, the methodology used to develop the Assembly options was undertaken in a number of stages:
 - Stage 1: Factors for consideration were discussed at a meeting of the Steering Group and a group of MPAs.
 - Stage 2: Five draft options for apportionment were presented to the Steering Group and WMRAWP.

⁵ Sub-regional Apportionment of Aggregates Provision in the West Midlands Region. Final Report. Prepared for West Midlands Regional Assembly by Land Use Consultants, March 2010.

⁶ http://www.wmra.gov.uk/Planning_and_Regional_Spatial_Strategy/RSS_Revision/RSS_Revision_Phase_3.aspx

- Stage 3: A revision of draft options followed, which incorporated suggestions and recommendations. These were written up in a draft report which was circulated by WMRA for a technical consultation with the WMRAWP.
- Stage 4: Technical stakeholder consultation on the draft options was undertaken. The consultation provided members of the WMRAWP and MPAs with an opportunity to comment on the methodology and draft options.
- Stage 5: Two new options for apportionment were introduced as a result of feedback from the technical consultation undertaken in Stage 4.
- Stage 6: Further limited technical stakeholder consultation on the two new options was held with the WMRAWP, including a meeting of the Regional Minerals and Waste Officers Group (RMWOG).
- Stage 7: Final alternative options for apportionment were developed and reported, taking into account feedback from the consultation undertaken in Stage 6.

Table 6: West Midlands

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered Some gaps in environmental issues incorporated or	WMRAWP options: environmental issues were not incorporated into the WMRAWP options for apportioning the national guideline figures for primary aggregates, as they were based solely on past sales trends, and consultants were commissioned to develop an option based on environmental designations and population growth. However, the WMRAWP options did include an option which took into account substitution of some of the primary aggregate guideline figures, with recycled and secondary aggregate provision (in consideration of reducing consumption of natural resources). Assembly options: International and national nature conservation, landscape and cultural heritage designations were included in the apportionment methodology, using GIS layers to calculate the area of 'unconstrained' resource outside of these designations. See also Table

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	<p>partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>2 below for coverage of the SEA Directive topics.</p> <p>Reasoned justification was provided as to why other environmental factors were not included:</p> <ul style="list-style-type: none"> • Floodrisk zones - this type of development (i.e. primary aggregate extraction) is considered 'water compatible' in PPS25 - the very nature of sand and gravel resource means that it is mainly going to be found in floodplains. • Conservation areas – Data was unlikely to be consistently available across the region and these areas are most likely to be within urban areas, which are considered as 'sterilised' with respect to available minerals resource. • Agricultural land Grade I - The best quality agricultural land may be in areas where there is underlying aggregate. It is possible to restore land to Grade I standard following extraction. • Green Belt – mineral extraction is an acceptable use in the Green Belt. • Local nature conservation and landscape designations – Inclusion of <u>local</u> level designations was not considered appropriate at the regional level due to the strategic nature of the sub-regional apportionment. It would also be difficult to obtain GIS data for these designations. • Ancient woodland - Based on PPS9, most ancient woodland should already have been designated under national SSSI designations. If there are areas that are not designated as SSSI, the assumption is that these will be local designations, and therefore they were not included.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			In terms of taking the impacts of transport of aggregates into account, the following justification was provided: “The Steering Group agreed that sustainable transport should be omitted as a factor in the sub-regional apportionment. This is because it is misleading to assume that just because a mineral resource is near to a particular transport mode or transshipment point, it could easily be transported using that mode of transport. When seeking to divert aggregate transportation from road to rail or water (i.e. towards, in principle, more sustainable forms of transport), capacity of the network and ability to tranship aggregates become key considerations.”
B	Degree to which reasonable alternative spatial options are considered	Method considers a full set of reasonable alternative apportionment options Some reasonable alternative apportionment options not considered Method based on one apportionment option	WMRAWP options: Scenario 1a – Existing extraction trends for sand and gravel and crushed rock based on last 3 years. Scenario 1b - Existing extraction trends for sand and gravel and crushed rock based on last 5 years. Scenario 1b - Existing extraction trends for sand and gravel and crushed rock based on last 10 years. Scenario 2 – Substitution approach – replacement of primary aggregate with increased use of recycled materials. Scenario 3a – Substitution approach – replacement of sand and gravel with increased sales of crushed rock. Scenario 3b – Substitution approach – replacement of crushed rock with sand and gravel Assembly options: Seven alternative spatial options were developed, covering a range of criteria that influence the supply and use of primary aggregates:

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<ul style="list-style-type: none"> • Option A: Supply-led; • Option B: Growth-led; • Option C: Environment-led; • Option D: Equal weighting; • Option E: Demand and resource. • Option F: Past sales-led • Refined Option F: Past sales led but with phasing
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<p>The apportionment options were generated using quantitative and spatial (GIS) data to quantify the different factors agreed to influence the apportionment:</p> <ul style="list-style-type: none"> • Factor 1: Demand (with a ratio of 6:4 for 1a and 1b) <ul style="list-style-type: none"> • Factor 1a: Future (Housing provision) (Data = Housing provision figures from Regional Housing Trajectory Indicative Average Annual Rates for 5 year periods presented in the Addendum to the Panel Report of the WM RSS Phase Two Revision for the period 2006-2021 with demolitions from West Midlands Regional Spatial Strategy Phase Two Revision – Draft Preferred Option December 2007 (Table 2) added) • Factor 1b: Current (Existing population) (Data = Existing population figures from ONS) • Factor 2: Past Sales (Data = Past sales figures from WMRAWP Annual Report 2007)

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<ul style="list-style-type: none"> • Factor 3: Unsterilised resource outside of international designations (including the Malvern Hills Conservators landholdings) Data = GIS layers showing spatial extent of geological resource and international designations from which area could be calculated) • Factor 4: Constraints (Data = GIS layers showing spatial extent of geological resource and international and national designations from which area could be calculated) <p>The seven alternative options were created by feeding the datasets into a Microsoft Excel based database, and using multi-criteria analysis, applying weightings to each criteria to reflect the strength of influence of each criterion:</p> <ul style="list-style-type: none"> • Option A: Supply-led weighted 70% on the supply (i.e. the location of the unsterilised resource), and 10% for each of the other factors (with a 6:4 ratio for future : current demand); • Option B: Growth-led weighted 70% on demand (with a 6:4 ratio for future: current demand), and 10% for each of the other factors; • Option C: Environment-led weighted 70% on constraints (i.e. the area of sterilised resource outside of environmental, landscape and heritage constraints), and 10% for each of the other factors (with a 6:4 ratio for future : current demand); • Option D: Equal weighting weighted 25% for all the factors (with a 6:4 ratio for future : current demand); plus an additional option: • Option E: Demand and resource weighted 40% on demand (with a 6:4 ratio for future: current demand), 40% on supply (the location of the unsterilised resource) and 10% each for past sales and constraints. • Option F: Past sales-led weighted 70% on past sales, and 10% for each of the other

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<p>factors (with a 6:4 ratio for future : current demand); and</p> <ul style="list-style-type: none"> Refined Option F: Past sales led but with phasing weighted 100% on past sales in the early years of the apportionment period (2011-2012), 90% weighting to past sales 2013-2015 decreasing to 70% in 2016-2020, so still the highest weighting to past sales, and distributing equal weighting to the remaining factors.
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>The apportionment method requires technical expertise and software in relation to numerical data analysis using Excel, and spatial data analysis using Geographical Information Systems.</p> <p>The basic method is relatively simple, however, collation and analysis of the datasets for each criterion is more complex. Despite this, with the necessary expertise and software, and following the method described in detail in the Final Report, the method could be replicated relatively easily.</p> <p>Data used to develop the apportionment options is summarised under criterion 3 above. All data sources, interpretation and limitations for each dataset were described in Chapter 3 of the Final Report. Each dataset had its own complexities, but could be obtained from publicly available data sources for the most part (except the BGS geological data).</p> <p>The main limitation in data was the <u>distribution, volume and viability</u> of geological resource in the region. The best available data at the regional scale was the DiGMapGB-100 Mineral Resource dataset at 1:50 000 from the British Geological Survey (BGS). However, there is some evidence that there are gaps in the BGS data (e.g. incomplete coverage of the Shropshire 'fault line' and SW Herefordshire). Some MPAs have undertaken further work with the BGS to map their resource more accurately, but there is not complete coverage for the Region. In addition, there is no 'off the shelf' data on the depth of the resource or</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<p>the quality of the resource.</p> <p>An approach was attempted to include 'proximity to markets' in the method, by applying a buffer of 38km (suggested by an economist for the Minerals Products Association as a distance that could be used to reflect the distance within which it is economically viable to transport minerals by road) to the Major Urban Areas (MUAs) and Settlements of Significant Development beyond MUAs (defined in the West Midlands Regional Spatial Strategy) to approximate the viable transport distance, as these settlements are likely to generate most of the demand for aggregates. These buffers covered almost the entire Region and it was decided therefore that introducing this further constraint to the resource data would not have a significant effect on the resulting apportionment options.</p> <p>An attempt was also made to include a restriction to the estimated volume of available resource to the areas of resource within each MPA sub-region which are/have:</p> <ul style="list-style-type: none"> • Existing extraction permissions; • Allocated sites in development plans; and • Preferred areas or potential sites preferred by developers in emerging Minerals development plan documents. <p>It was not possible to obtain GIS data and location of all of these sites for the Region in the timescale of the project, and from the data that was obtained from the MPAs, it was decided that this would limit the resource data to too large an extent.</p>
E	Level of spatial definition of outputs	Based on MPA boundaries (or groupings of MPAs)	The apportionment options were produced by MPA/group of MPAs, and no site-specific analysis was carried out.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Based on 'resource blocks' – distribution of different types of minerals resource Includes site-specific analysis	
F	Extent of stakeholder engagement	Involves full range of stakeholder interests in developing apportionment options Some key stakeholders not involved and/or limited stakeholder involvement in the process Small steering/sub-group with very limited range of stakeholders and stakeholder involvement	Assembly options: An iterative process was undertaken involving a Steering Group consisting of representatives from the West Midlands Regional Assembly and the WMRAWP Technical Secretariat, as well as meeting with representatives of the MPAs, and meetings with the full WMRAWP to which statutory environmental bodies were also invited. The development of options went through the following stages: <ul style="list-style-type: none"> • Stage 1: Factors for consideration were discussed at a meeting held with the Steering Group and a group of MPAs on 13th November 2009. • Stage 2: Five draft options for apportionment were presented to the Steering Group and WMRAWP at a meeting held on 4th December 2009. • Stage 3: A revision of draft options followed, which incorporated suggestions and recommendations that had emerged from the 4th December meeting. These were written up in a draft report which was circulated by WMRA for a technical consultation with the WMRAWP. • Stage 4: Technical stakeholder consultation on the draft options was held 18th December 2009 to 22nd January 2010. The consultation provided members of the WMRAWP and MPAs with an opportunity to comment on the methodology and draft options. • Stage 5: Two new options for apportionment were introduced at the WMRAWP

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>meeting held on 9 February 2010. These options drew on feedback from the technical consultation undertaken in Stage 4.</p> <ul style="list-style-type: none"> • Stage 6: Further limited technical stakeholder consultation on the two new options was held with the WMRAWP from 17th February 2010 to 26th February 2010, including a meeting of the Regional Minerals and Waste Officers Group (RMWOG) (23rd February 2010), and discussions at the WMRAWP meeting 3rd March 2010. • Stage 7: Final alternative options for apportionment were presented in the Final Report taking into account feedback from the February 2010 consultation and 3rd March 2010 WMRAWP meeting.

YORKSHIRE AND HUMBER

30. The 2004 Annual Report of the Yorkshire and Humber Aggregates Working Party confirms that there were adequate permitted reserves of crushed rock aggregate in the region to meet regional guidelines. The methodology adopted for apportioning crushed rock was therefore divided on the basis of existing historic shares, using an average over the 5-year period 1997 to 2001.
31. Evidence suggested that identified permitted reserves of sand and gravel at the beginning of 2001 were 55 MT – a shortfall of 18 MT and the Annual Report identified the need for a region-wide study to assess the environmental impacts of additional sand and gravel extraction and the ability of aggregate producing areas to absorb these impacts. Consequently, the British Geological Society (BGS) were commissioned in 2004 to complete the first phase of this study. This first phase helped to identify the extent of potential reserves of sand and gravel suitable for use as concrete aggregate reserve, and how these relate to environmental constraints in the region. In doing so, a range of useful planning and GIS datasets were drawn together.
32. Following on from the BGS study, LUC were commissioned by the Regional Assembly to develop and appraise spatial options for the sub-regional apportionment of land-won sand and gravel to 2016, with the view to recommending an option that performs best on sustainability grounds. A number of underlying criteria were used to characterise the range of spatial options for apportioning the shortfall, related to supply, demand and environmental considerations.
33. Working closely with a steering group of RAWP members and others, different weightings were attached to each criterion, altering the apportionment and allowing for different spatial options to be generated by Sub-Region (grouping of MPAs). The focus throughout this process was on developing reasonable, realistic and relevant options, rather than those based on extremes. The five resulting options were then appraised using a set of objectives based on those used for the SA/SEA of the RSS.

Table 7: Yorkshire and Humber

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues	All major environmental issues appropriate for	Environmental issues incorporated into the methodology:

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
<p>incorporated (e.g. components of environmental capacity, SEA Directive topics)</p>	<p>consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<ul style="list-style-type: none"> • Effect on International and National Nature Conservation Designations – Ramsar sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and National Nature Reserves • Effect on designated Heritage Assets – Listed Buildings, World Heritage Sites, Registered Parks and Gardens, Scheduled Ancient Monuments and Historic Battlefields. • Effect on National Landscape Designations – Areas of Outstanding Natural Beauty, National Parks and Heritage Coasts <p>Other issues considered but not included:</p> <ul style="list-style-type: none"> • Green Belt – although Green Belt is a nationally significant designation, national planning guidance makes it clear that minerals development need not be inappropriate development nor conflict with the purposes of designating Green Belts, provided that high environmental standards are maintained and that sites are well restored. • Flood risk – there is flexibility in the application of the sequential test for gravel workings which are considered to be ‘water compatible development’. • Risk of bird strike within civil aviation – ODPM / DfT Circular 01/2003 establishes a 13km consultation zone around civil airports. The 13 km consultation zone does not rule out gravel working, but the Civil Aviation Authority would be concerned if the activity or afteruse (especially if it involved landfilling) would attract birds or alter bird flight routes, thus increasing the risk of bird strike.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<ul style="list-style-type: none"> • Nature conservation, landscapes and heritage features of local importance – local planning processes are appropriate for determining the siting of minerals development in relation to these aspects of local importance, and standards of mitigation required e.g. buffer zones around important habitats. • Sustainable transport – whilst criteria 3 and 4 take account of the proximity of the existing population when considering future demand for sand and gravel, and hence travel distance, it has not been possible to develop a criterion that measures transport mode (rail and water, rather than road). Measuring the density of provision of railheads and aggregate wharves does not necessarily correspond to the capacity of the transport network to facilitate the movement of sand and gravel – this would require detailed information on the current and future capacity of the network and potential for expansion, information that is not available to this study. • Existing contracts and patterns of movement – such a criterion would be useful for reality checking any conclusions reached with respect to transport. However, it is anticipated that the necessary data would be very difficult to obtain, both in terms of availability and commercial sensitivity. Contractual information is also likely to be less significant than for waste management, for example, where contracts tend to be longer term. <p>Other issues such as transport distances and effect on the population were considered within the second part of the methodology – the SA of options.</p> <p>Crushed rock aggregate was apportioned on the basis of existing historic shares, using an average over the 5-year period 1997 to 2001.</p>
B	Degree to which	Method considers a full	A series of options were developed in consultation with stakeholders. These were

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
<p>reasonable alternative spatial options are considered</p>	<p>set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	<p>developed by weighting criteria related to supply, demand and environmental considerations.</p> <p>The following five options were put forward for appraisal:</p> <p>Option A Option A represents 'business as usual' in that it assumes that the current apportionment will continue into the future. The current apportionment has in the past been calculated upon historic sales and production figures, using the data and detailed knowledge held by RAWP members. Almost 60% of the resource would therefore be sourced from North Yorkshire with much lower levels to be sourced from elsewhere in the region.</p> <p>Option B Option B places greater importance on the natural and built environment especially in international and national protected environments, at the agreed ratio of 2:1. Sales and future development are also given considerable weighting due to the need to reduce transport distance and hence reduce greenhouse gas emissions and their contribution to climate change. The location of the resource and the existing population are given the lowest weightings.</p> <p>Option C Option C gives greatest weight to the unsterilised resource and past use (sales). It therefore focuses on areas with significant, realistic and good quality resources as the industry will normally prefer to invest in certain areas in the longer term, rather than just working a small pocket of resource. Some weight is given to existing population and future development but this option assumes that other factors such as the quality and accessibility of the resource and effects on people and locally-valued countryside are more important. International and national designations are given the lowest weightings, but are still considered to be important factors.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			<p>Option D This option seeks a relatively even balance between protecting environmental assets and recognising drivers for growth in requirements for aggregate, and the benefits in principle of locating sources of supply relatively close to sources of demand. It also retains some weight on the past use (sales) criterion to acknowledge established infrastructure and more localised (e.g. intra-authority) supply patterns.</p> <p>Option E Option E assumes that the issue of overriding importance is the need to reduce transport distance and therefore gives substantial weight to the location of the existing population and the effects of future growth.</p>
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<p>Options were developed by agreeing a list of criteria related to supply, demand and environmental considerations. The following criteria were included:</p> <ol style="list-style-type: none"> 1. Unsterilised, available resource 2. Past use (sales) 3. Existing population 4. Future development 5. Nature conservation 6. Landscape 7. Heritage <p>The most appropriate data set for each criterion was used to develop a percentage split between minerals planning sub-regions. Apportionment options A – E could then be developed with stakeholders by weighting the relative importance given to each criterion.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>The apportionment method requires technical expertise in minerals planning and data analysis and interpretation. It requires technical expertise and software in relation to numerical data analysis using Excel, and spatial data analysis using Geographical Information Systems. The method quantifies criteria to develop apportionment options (often using proxy measures) but is easily replicable.</p> <p>The methodology requires data to be obtained for each of the criteria, to enable a percentage split to be developed. The data was applied at a sub-regional scale – minerals planning sub-regions which are groupings of MPAs.</p> <p>The main data limitations were:</p> <ul style="list-style-type: none"> • Lack of data on the quantity of unsterilised resource available i.e. it was possible to calculate the land area available, but knowledge on the depth and quality of resource was variable across the region. This had a major effect on whether options could be considered to be reasonable and sustainable and further work was undertaken to share industry knowledge on resources and improve the robustness of the research findings. • It has not been possible to develop a criterion that measures transport mode (rail and water, rather than road). Measuring the density of provision of railheads and aggregate wharves does not necessarily correspond to the capacity of the transport network to facilitate the movement of sand and gravel – this would require detailed information on the current and future capacity of the network and potential for expansion, information that is not available to this study. • Existing contracts and patterns of movement – such a criterion would be useful for reality checking any conclusions reached with respect to transport. However, it is

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
			anticipated that the necessary data would be very difficult to obtain, both in terms of availability and commercial sensitivity. Contractual information is also likely to be less significant than for waste management, for example, where contracts tend to be longer term.
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	Outputs for this region are at a sub-regional scale – minerals planning sub-regions which are groupings of MPAs, but the methodology could also be applied at MPA level.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	The apportionment methodology was developed by consultants in collaboration with the regional RAWP and a wider group of stakeholders, including environmental bodies such as Natural England. Options were put forward by stakeholders by stating the level of importance they felt should be attached to different criteria. The results were also discussed with a group of industry representatives.

NORTH EAST

34. The North East RAWP identified three scenario titles for the apportionment of aggregates in the region, one based on Recent Sales Information, the second based on potential resources and the third on potential resources and market location. NERAWP then commissioned Entec to develop these scenarios and undertake an environmental appraisal of the results.
35. Scenario 1 used sales information presented in the RAWP reports from 2001 to 2007 to determine the proportion of sales each sub-region provided during this period. This information was then used to split the North East regional guideline figure.
36. In order to establish the potential resources which could be worked in each sub-region for the development of Scenario 2, the minerals planning authorities provided information on the existing permitted reserves (2007), planning applications awaiting determination, pre-application enquires from operators and submissions made to LDFs. The total potential resource for each sub-region was then used to identify the proportion of the North East regional guideline figure that should be allocated to each sub-region.
37. Scenario 3 (potential resources and market location) was developed as it was acknowledged that the greatest demand for aggregate materials is likely to be found in the Tees Valley and Tyne and Wear and therefore greater account should be taken of the potential resources available in these two sub-regions. This however this was moderated by the acknowledgement that there will also be some significant market requirements coming from Durham and Northumberland (e.g. New Growth Points). The amount of material identified for the Tees Valley and Tyne and Wear in Scenario 2 was increased to reflect their greater share of the market. The amounts were increased to 70% of the total potential resources identified for Tees Valley and Tyne Wear, which was considered high enough to reflect the focus of the market in these areas but low enough to account for the other market pressures in Durham and Northumberland. This approach helped to minimise the transport of materials from source to the markets.
38. As a result of the comments received from the Steering Group on Scenarios 1, 2 and 3, it became apparent that there were a number of local issues regarding sand and gravel which were not being picked up fully by these scenarios. A fourth scenario (potential resources and steering group comments) for sand and gravel was therefore developed to give sufficient weight to all of the comments received. The figures identified in Scenario 2 were used as a starting point in order to ground the figures against an established evidence base. Scenario 4 was further amended following a full RAWP meeting to include consideration of further comments received.

Table 8: North East

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>Although the scenarios were subject of a detailed environmental appraisal to identify their suitability in terms of environmental, social and economic impacts, the development of the scenarios themselves took few environmental considerations into account. Scenario 3, by consideration of the demand for aggregates in the region, aimed to minimise the transport of materials from source to the markets thereby considering environmental issues such as air quality and climate change.</p> <p>Scenario 4, developed to reflect local issues raised by the Steering Group during reviews of Scenarios 1, 2 and 3, took some environmental issues into account on an ad hoc basis, dependent upon the comments received. For example, Northumberland accepted that the county has substantial amounts of potential resources and therefore needs to take a reasonable share of the apportionment; however, any share can not be too high due to the environmental capacity of the area, the number of new sites/increase in production which may be required, and the distances to the main markets.</p>
B	Degree to which reasonable alternative spatial options are considered	<p>Method considers a full set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p>	<p>Alternative spatial options were considered, based on past production, potential resources and the market demand, however, additional reasonable alternatives could have been considered such as avoidance of sensitive environmental receptors or maximising the use of sustainable transport modes such as rail and water.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method based on one apportionment option	
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<p>The scenarios were not developed using a system such as scoring, weighting or GIS overlays, but did take both quantitative and qualitative data into account. Development of Scenarios 1 and 2 were undertaken based on quantitative data where available, including past production and existing permitted reserves. Although quantitative data was used as the starting point for Scenarios 3 and 4, they were further developed using qualitative data regarding market demand and local issues.</p>
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely</p>	<p>Once the data from RAWP reports, MPAs and industry is collated, the methods used to produce each apportionment scenario is straightforward and would be easy to replicate.</p> <p>The majority of the data used in the development of the options is readily available through the RAWP report or consultation with MPAs and industry. Issues regarding company confidentiality and estimates of permitted reserves led to some limitations regarding the data available for the development of Scenario 2. Geological data was not utilised for the scenarios.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		to be readily available.	
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The apportionment scenarios are based on four identified sub-regions: Durham, Northumberland, Tees Valley and Tyne and Wear.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	NERAWP includes representatives of the constituent MPAs, central government departments and the aggregates industry, however, the Environment Agency, Natural England and English Heritage were written to by the RAWP to make them aware that was being undertaken to apportion the revised regional guidelines to the sub-regions. Only Natural England responded with a request to be kept informed as work progresses.

NORTH WEST

39. The North West RAWP Technical Secretary (Cheshire West and Chester Council), presented the report *Draft Paper on Proposed Sub-Regional Apportionment Methods for the North West* to the RAWP in December 2009. It set out four potential methodologies for sub-regional apportionment:
1. Five year average production AM2003-2007 published figures.
 2. Five year average production AM2004-2008 unpublished figures for 2008.
 3. Five year average production AM2004-2008, deleting the highest and the lowest production years.
 4. Continuation of the 2003 percentage split.
40. The RAWP agreed that methods 2 and 4 should be taken forward with an extra model using a 10 year average; methods 1 and 3 should be dismissed. The three remaining options are based on previous sales in order to prevent over complicating the process:
- Option 1: Five year average production AM2004-2008, deleting the highest and the lowest production years.
 - Option 2: Continuation of the 2003 percentage split.
 - Option 3: Ten year average production AM2004-2008.
41. The three options were presented at the RAWP meeting in July 2010. Option 2 had no support, Option 1 had the support of the two Cheshire unitary authorities (Cheshire West and Chester and Cheshire East); Option 3 had the support of the Greater Manchester sub-region (including Merseyside and Warrington) and Lancashire. Cumbria did not support of any of the three options. A compromise was met, taking forward Option 3, but using an eight year supply.
42. Revised Option 3 is the preferred option for the sub-regional apportionment from the North West RAWP. It was a majority decision (Cheshire, Lancashire, Greater Manchester, including Warrington and Merseyside). Cumbria did not agree the option and therefore the report will be taken forward with Cumbria dissent.

Table 9: North West

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	All options considered were based on variations of past production or a continuation of the previous sub-regional apportionment split.
B	Degree to which reasonable alternative spatial options are considered	<p>Method considers a full set of reasonable alternative apportionment options</p> <p>Some reasonable alternative apportionment options not considered</p>	Although alternative apportionment methodologies were considered, which would lead to varying spatial distributions, there are reasonable alternative apportionment options that were not considered. For example, ones that took designated nature conservation sites or proximity to areas of demand into account.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		Method based on one apportionment option	
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	The methodology used (and the alternatives considered) is based on the quantitative analysis of past production figures.
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>The mathematics behind the methodology are simple and could be replicated easily.</p> <p>The methodology relies on the provision of production data by industry. This information is collated by the RAWP annually to feed into the annual monitoring reports, however, due to confidentiality issues, some data may not be available.</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	The sub-regional apportionment is provided to MPAs and groups of MPAs: Cumbria; Lancashire; Cheshire; and, Greater Manchester, Merseyside, Halton and Warrington.
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<p>The NWRAWP area is comprised of the counties of Cheshire, Cumbria (including the Lake District National Park) and Lancashire, the Metropolitan Boroughs of Greater Manchester and Merseyside along with the Unitary Authorities of Blackburn with Darwen, Blackpool, Halton and Warrington. Those parts of the Peak District National Park which fall within Cheshire and Greater Manchester are represented by the East Midlands Regional Aggregates Working Party and those parts of the Yorkshire Dales National Park which fall within Cumbria are represented by the Yorkshire and Humberside Regional Aggregates Working Party.</p> <p>Membership of NWRAWP is drawn from the constituent mineral planning authorities (MPAs), central government departments and representatives from the aggregates industry. The metropolitan districts in Greater Manchester are represented by the Greater Manchester Geological Unit (GMGU), which provides mineral planning services to the ten Metropolitan Borough Councils (MBC). The five Merseyside authorities are represented on mineral planning issues by the Environmental Advisory Service (EAS) which regularly provides professional planning advice for Knowsley, Sefton and St Helens MBCs on issues relating to the environment including mineral extraction and waste disposal. Lancashire County Council acts for the authorities of Blackpool and Blackburn with Darwen on minerals policy issues. Cumbria acts for the Lake District National Park Authority in respect of work undertaken by NWRAWP. The authorities of Halton and Warrington undertake</p>

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>their own mineral duties.</p> <p>Local Government Representatives are:</p> <ul style="list-style-type: none"> • Cheshire County Council • Environmental Advisory Service • Lancashire County Council • Cumbria County Council • Lake District National Park Authority • Warrington Borough Council • Greater Manchester Geological Unit <p>Central Government Representatives are:</p> <ul style="list-style-type: none"> • Highways Agency (Manchester) • Government Office North West • DCLG • 4NW <p>Industry Representatives are:</p> <ul style="list-style-type: none"> • United Marine Aggregates • British Marine Aggregates Producers Association • Tarmac Limited • Hanson Aggregates • Mineral Products Association • British Aggregates Association • WBB Minerals • Aggregate Industries UK Limited <p>In addition, the North Wales Regional Aggregates Working Party is represented.</p> <p>The key stakeholders not represented are the statutory environmental organisations: the Environment Agency, Natural England and English Heritage.</p>

NORTH AND SOUTH WALES

43. Deciding how to ensure that the right sites in the right areas are producing sufficient aggregates to satisfy the market at reasonable cost while causing the least environment and social disruption will never be easy. The process of apportioning aggregates requirements between local planning authorities in Wales has changed in the last ten years in an effort to become more sustainable.
44. The South Wales and North Wales RAWPs have run their arrangements in parallel. The methods used have been largely the same: for the purposes of this report they are treated as one, with specific differences highlighted where appropriate. The principal difference between the two regions is that North Wales exports a substantial proportion of its output (3.75mt in 2005, comprising 54% of the region's 6.90mt production that year) to England, mainly to North West England. Crushed rock is the main component of this (88% of exports). Virtually all of this is exported from North East Wales, whereas North West Wales is largely self-sufficient in aggregates with little movement of aggregates in or out.
45. The Foreword to the South Wales Regional Technical Statement (RTS) succinctly describes the approach used in practice:

“The RTS seeks to achieve a more sustainable approach to the provision of aggregates. Instead of the traditional ‘predict and provide’ process of determining how much aggregate is being sold and then providing sufficient reserves to meet the demand, a more sustainable approach has been adopted. In essence, this new process determines what is happening now and whether or not based on (a) the population of the area (b) the reserves of the area (c) the environmental capacity of the area (d) the natural resources of the area, and (e) the proximity principle, existing patterns of supply need to change” (p5).
46. Expressed this way, it is clear that the future pattern of aggregates supply is not to be driven by the environmental capacity method outlined above. This is just one input. The RAWPs’ method of apportionment as an alternative to the conventional approach was expressed as follows:

“Two sets of sustainability policies have been brought into play in shaping this method. Firstly the proximity principle (i.e. reducing journey lengths) which aims to source material from as close as possible to the consumer. Secondly, future working should be focussed upon those areas which have the greater environmental capacity to accommodate future working. This method therefore seeks to use the distribution of population as a proxy for the distribution of demand” (South Wales RTS, paragraph 4.4).
47. In the practical application of this approach, the use of the proximity principle appears to have dominated. The proximity principle is strongly advocated in WAG’s policy statement Minerals Technical Advice Note 1 (MTANI, paragraph 40).

48. In the practical application of this approach, the use of the proximity principle appears to have dominated. The proximity principle is strongly advocated in WAG's policy statement Minerals Technical Advice Note 1 (MTANI, paragraph 40). Both RTSs compared the current supply in each authority with supplies that would be appropriate if tied to population size:
- In South Wales this showed supply deficits in a small number of authorities, so the RAWP proposed particularly that Newport, Torfaen and to a lesser extent Blaenau Gwent should identify land for aggregates working, in a deliberate attempt to change the pattern of supply from that which the market currently provides. In practice, aggregates planning in Newport has been encouraged by the South Wales RAWP to be in co-operation with Caerphilly: the latter has a large rock quarry serving Newport, located close to the boundary with Newport, which may obviate the need for a fresh allocation with Newport.
 - In North Wales, after making allowance for the substantial exports from the north-east authorities, the exercise found a remarkably small imbalance between production and consumption. Unfortunately, for data confidentiality reasons, the authorities were grouped into a north-east Wales block and a north-west Wales block, so any imbalance between authorities within the same blocks was masked. Nonetheless, at this sub-regional level there was little need to seek to amend the supply pattern on the basis of the proximity principle.
49. More generally, the intention to change the pattern of supply to a more sustainable one turned out to be remarkably difficult in anything other than the long term (in most areas), due to the enormous permitted reserves. In both regions most authorities had comfortably more than 20 years' reserves, particularly for hard rock, and WAG policy is to exempt these from the need to accommodate additional aggregates allocations. In a small number of locations future permissions for aggregates working could change the pattern of supply in line with the environmental capacity approach, notably by supporting replacement sites outside the Brecon Beacons and Pembrokeshire Coast National Parks. Elsewhere any significant change towards an environmental capacity-based approach would take decades if new quarries could only be opened when existing permissions expired.
50. In both regions there were more limited permitted reserves of sand and gravel, though in South Wales there was greater scope to supplement supplies with marine-dredged sand and gravel landed at South Wales ports. Some modest sand and gravel apportionments were made in the North but not in the South.
51. The environmental capacity implications of meeting aggregates requirements were considered briefly, though the pattern of distribution proposed was led overwhelmingly by the proximity principle rather than the traffic light system for environmental capacity used in IMAECA. In North Wales an appendix to the RTS was devoted to outlining how the traffic light system applied to each of the main geological resources in each authority in the region (whether additional allocations were anticipated or not). This was superior to the

South Wales RTS, though the significance of it to the planning process was less in view of the still more limited need for rock allocations in the North.

Table 10: The apportionment system in Wales

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
A	Range of environmental issues incorporated (e.g. components of environmental capacity, SEA Directive topics)	<p>All major environmental issues appropriate for consideration at the regional level incorporated into methodology, with justification for any not considered</p> <p>Some gaps in environmental issues incorporated or partial consideration and no clear justification for this</p> <p>Several gaps or very partial consideration of environmental issues and no clear justification for this</p>	<p>A key feature shaping the apportionment methodology in Wales has been the proximity principle: reducing the distances over which aggregate minerals need to be transported. A deliberate attempt was made to align quarrying location to the distribution of population. This offers benefits both to greenhouse gas emissions and to air pollution from transport.</p> <p>All the other environmental issues accommodated were within a Wales-wide environmental capacity study. This was particularly impressive in treating key wildlife constraints (SPAs, SACs and Ramsar sites) and National Trust controlled land and World Heritage Sites as absolute restrictions on aggregates working if they dominated a 1 km grid square.</p> <p>All other listed constraints were properly incorporated with the following minor exceptions:</p> <ul style="list-style-type: none"> – flood risk was not specifically covered, though proximity to water courses was; – impact on groundwater reserves addressed the main aspect of effect on water quality; – effect on Green Belt was not covered as there are no Green Belts in Wales; – safeguarding around aerodromes was not considered, probably being a minor issue.
B	Degree to which reasonable alternative spatial options are	Method considers a full set of reasonable alternative apportionment options	The main likely effects of working in different areas was studied, but not through the vehicle of a review of options. The environmental capacity approach drew attention to the relative merits or difficulties of aggregates working everywhere, and to that extent environmental options geographically were presented for consideration.

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	considered	<p>Some reasonable alternative apportionment options not considered</p> <p>Method based on one apportionment option</p>	<p>The methodology started from a sustainability perspective, so options such as considering a demand-led (minimum cost) pattern of supply or a pattern based on retaining historic distributions of quarries were not presented. The proximity principle would, though, indirectly afford some support to a demand-led supply pattern. However, underpinned by geological information on workable resources of aggregates-bearing resources, the method did allow any particular geological formation (out of eleven groups) to be selected and the environmental capacity of the areas covered to be identified. This integrated a positive approach to identifying resources with the environmental capacity approach.</p>
C	Transparency of approach	<p>Method followed and judgements made are explicit and based on best available evidence.</p> <p>Method followed and judgements made are not always clear or fully justified.</p> <p>Method followed and judgements made are largely subjective and not clearly linked to evidence.</p>	<p>GIS data is used to generate a 'traffic light' system of assessment, with thresholds selecting the boundaries between the red, orange and green lights. These thresholds can be changed, and a weighting system can be used to vary the initial assumption that all 12 environmental topics (or groups of topics) have equal weight. Although these are not strictly options – rather they produce gradations along a continuum of environmental capacity – they can be manipulated to examine the effect of changes in assumptions on the revealed preferences (i.e. proportions of red, orange and green areas).</p> <p>Other assessment work, outside the scope of the environmental capacity tool, also involves quantitative analysis (comparison of population location with quarry location) but is outside the GIS system and with a measure of pragmatism alien to the environmental capacity tool.</p>
D	Data and technical requirements (including level of definition of geological data required)	<p>Method requires limited technical expertise and data is readily available.</p> <p>Method requires some technical expertise and</p>	<p>The environmental capacity tool is GIS-based. This requires considerable data across numerous environmental topics.</p> <p>The GIS tool is reasonably easy to use. A 'GIS querying tool' has been developed to accompany the data: this has been designed so that the user does not need to have extensive GIS computing skills (basic knowledge of ArcView only). It can be run on a</p>

Evaluation Criteria		Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
		<p>has some current data limitations.</p> <p>Method is technically complex and data unlikely to be readily available.</p>	<p>computer provided ArcView 9 is installed, even if it does not have Microsoft Access installed. It is also easily updated when new information becomes available, and is compatible with other WAG GIS applications.)</p> <p>The method uses the best data available to identify geological formations of potential interest for mineral working. This is supplied by BGS. Although some problems were identified in relatively remote areas, ongoing mapping work and improvements to the database over time suggest that this is a matter of continual refinement rather than the data being insufficient to sustain the method.</p> <p>Apart from geological information, other data were available or could be obtained and entered into the GIS system. The environmental capacity study is nonetheless data-heavy.</p>
E	Level of spatial definition of outputs	<p>Based on MPA boundaries (or groupings of MPAs)</p> <p>Based on 'resource blocks' – distribution of different types of minerals resource</p> <p>Includes site-specific analysis</p>	<p>Output information is provided on 1km squares through the environmental capacity study. Output information can also be at the scale of the individual geological resource block. Information on population distribution is at the local authority level. The methodology has limitations on its use in local development plan making and especially in development control, due to the geographical scale at which it applies.</p>
F	Extent of stakeholder engagement	<p>Involves full range of stakeholder interests in developing apportionment options</p> <p>Some key stakeholders not</p>	<p>The environmental capacity tool had some stakeholder participation in its creation, but hardly any in its application. However, use of the tool is a political process that can in principle be made as open as the decision-maker desires. In reality, that engagement was very limited. Likewise, the assessment of the proximity principle has been treated as a technical exercise.</p>

Evaluation Criteria	Strength/Weakness Category (relevant category highlighted in bold)	Justification/explanation (of why apportionment methodology categorised as strength or weakness)
	<p>involved and/or limited stakeholder involvement in the process</p> <p>Small steering/sub-group with very limited range of stakeholders and stakeholder involvement</p>	<p>The principal opportunity for stakeholder engagement will be when the RTS advice is taken forward into Local Development Plan preparation, though arguably that will be at too late a stage to influence the apportionment method in a meaningful way.</p>

Appendix 4

Thresholds for the Environmental Capacity Approach used in Wales

Appendix 4: Thresholds for the Environmental Capacity Approach used in Wales

The Environmental Capacity approach developed for Wales applied a series of thresholds for traffic light colours in each 1km grid square. These are:

Settlements:

- red: over 20% of square in settlement
- orange: 5 - 20% of square in settlement
- green: less than 5% of square in settlement

Watercourses at risk from extraction activities (watercourse proximity):

- red: same square
- orange: up to 1km distant
- green: beyond

Watercourses at risk from extraction activities (groundwater reserve proximity):

- red: same square
- orange: up to 1km distant
- green: beyond

Standard of road (accessibility of roads of different grades):

- red: no access to motorway or A road in square; over 500m to B road
- orange: no access to motorway or A road in square; <500m to B road
- green: access to motorway or A road in square

Agricultural land grade ('land use class', but note Grade 3 not divided in Wales):

- red: area covered by grades 1, 2 or 3 greater than other use classes
- orange: area covered by grades 4 or 5 greater than other use classes
- green: area covered by urban or unclassified greater than other use classes

Nationally designated nature conservation sites (SSSIs):

- red: SSSI in square
- orange: SSSI in adjacent square
- green: no SSSI in square or adjacent square

Proximity to Scheduled Ancient Monuments:

- red: 3 or more SAMs in square
- orange: 1 or 2 SAMs in square
- green: no SAM in square

Proximity to Historic Landscape:

- red: within the square
- orange: within adjacent square
- green: beyond

Rights of Way (total length in square):

- red: over 3km
- orange: 1-3km

green: under 1km

National Trust land:

red: in square
orange: in adjacent square
green: beyond

National Trail:

red: in square
orange: in adjacent square
green: beyond

Country Park:

red: in square
orange: in adjacent square
green: beyond

Common Land:

red: in square
orange: in adjacent square
green: beyond.

National Parks:

red: in square
orange: within 7km
green: beyond.

Areas of Outstanding Natural Beauty:

red: in square
orange: within 7km
green: beyond

Special Landscape Areas:

red: in square
orange: within 3km
green: beyond

Heritage Coasts:

red: in square
orange: within 3km
green: beyond.

Visibility of fixed plant or quarry faces:

red: 3 or more in square
orange: 1 or 2 in square
green: none in square

Nuisance buffer around existing workings (100m for sand & gravel, 200m for hard rock):

red: over 50% of square affected by quarry buffer zones

orange: between 0 and 50% of square affected by quarry buffer zones
green: square not affected by quarry buffer zones

Cumulative impact of aggregates in the area (no. of derelict or partially restored extraction sites):

red: 1 or more in square
orange: in adjacent square
green: beyond

Appendix 5

British Geological Survey Data

Appendix 5: British Geological Survey Data

THE BGS MINERAL RESOURCE DATA

Basic mineral resource information is essential to support mineral exploration and development activities, for resource management and land-use planning, and to establish baseline data for environmental impact studies and environmental guidelines. It also enables a more sustainable pattern and standard of development to be achieved by valuing mineral resources as national assets.

The aim of the British Geological Survey's mineral resource data is to deliver up-to-date mineral resource information in digital format for use by national, regional and local government, industry and other interested parties for sustainable resource management, planning and policy development. As such, provision of the mineral resource data assists all interested parties involved in the preparation and review of planning documents, both in relation to the extraction of minerals and the safeguarding of mineral resources from sterilisation, by providing a knowledge base on the nature and extent of mineral resources. However, it is anticipated that the data will be of use to a much wider audience, including the minerals industry, other agencies and government bodies, environmental interests and the general public.

REASON FOR DEVELOPING THE BGS MINERAL RESOURCE DATA

Prior to the availability of the BGS mineral resource data, Mineral Planning Authorities had to utilise and interpret traditional geological maps in order to assess the location and extent of lithologies that comprise a mineral resource in order to inform their planning documents. Recognising the need for more accessible and specific data the (then) Department of the Environment commissioned the BGS to undertake a pilot study on four Mineral Planning Authority (MPA) areas - Bedfordshire, Derbyshire, Staffordshire and the Peak District National Park, which developed a methodology for the collection, interpretation and display of mineral resource data in a consistent and comparable format. Following successful completion of the pilot study the BGS was commissioned by the Office of the Deputy Prime Minister (now Department for Communities and Local Government), through the research project *Mineral Resource Information in Support of National, Regional and Local Planning*, to prepare a series of 'county' mineral resource maps. This work started in 1996 and was completed in early 2006 and a series of digitally generated maps at a scale of 1:100 000 are available. These maps cover 44 administrative areas or groups of administrative areas, giving information for the whole of England. It is the mineral resources depicted on these that comprise the digital BGS minerals resource data. The data provides a 'county' level resource inventory. Accompanying each map is a separate concise report which covers the area of the map. The report describes the methodology adopted and also provides a synopsis of the mineral resources present in the area.

Four major elements of information are presented on the maps:

- the geological distribution of all onshore mineral resources
- the location of mineral extraction sites

- the extent of mineral planning permissions and licences for coal extraction
- the extent of selected landscape and nature conservation designations (National Parks, AONBs, SSSIs, NNRs and scheduled monuments).

DEVELOPMENT OF THE BGS MINERAL RESOURCE DATA

To be able to assess mineral resources it is essential to have a reliable geological base. The mineral resource data have been produced by the collation and interpretation of data principally held by the BGS. Mineral resources are defined within a GIS environment, using primarily digital geological linework at 1:50 000 scale (the BGS DiGMapGB 1:50 000 scale data) as the basis for all mineral resource polygons. DiGMapGB is based on 1:10 560 or 1:10 000 scale surveys, which cover most of the country. In general, the more recent the survey the more detailed it is likely to be.

The mineral resource data set is constructed by identifying those lithological units, from DiGMapGB, which can be considered as mineral resources. As many sources of information as possible are consulted when considering which geological units constitute a mineral resource, ranging from historic publications (memoirs for geological map sheet areas, mineral specific reports such as, for example, on coal etc.), consultation with geologists with specialist knowledge of the local area, consultation with the minerals industry, and the location of current and previous mineral extraction as held in the BGS BritPits database of mines and quarries.

Mineral Resource Classification

The majority of the BGS mineral resource data show the extent of inferred mineral resources, that is, those mineral resources that can be defined from available geological information. Generally, a mineral resource is known to exist within the boundaries outlined by geological mapping, which may be supplemented by more in depth geological data. They have neither been evaluated by drilling or other sampling methods, nor had their technical properties characterised, on any systematic basis. Mineral resources defined on the map delineate areas within which potentially workable minerals may occur. These areas are not of uniform potential, nor do they take account of planning constraints which may limit their working. The economic potential of specific sites can only be proved by a detailed evaluation programme. The extent of mineral resources shown in these data is also the inferred surface expression (outcrop) of the resource. Workable minerals may extend beneath overburden which is adjacent to the outcrop area shown.

Where thematic sand and gravel assessment studies have been undertaken by the BGS, sufficient information is available to define mineral resources at the indicated resource level. Thematic sand and gravel assessment studies were undertaken by the Industrial Minerals Assessment Unit (IMAU), which existed in BGS during 1971 – 1990. The IMAU compiled over 140 reports as part of a national stock-take of industrial minerals, funded by the (then) Department of the Environment. The survey was concerned with the estimation of resources which included deposits that may not be currently exploitable but may have a foreseeable use with changes in population, economics and demand. Of the 140 reports, 134 pertained to the evaluation of sand and gravel resources. Resources were defined as 'indicated' in terms of resource confidence by utilising qualitative and quantitative data on

lithology, composition, particle size analysis and other information of commercial value. The assessments were intended to assist in the choice of areas for further, follow-on, targeted surveys. Those resources defined at an indicated level are clearly differentiated in the current BGS mineral resource data.

What data are available?

The BGS mineral resource data contains the following onshore minerals all of which are likely to be of importance to future supply:

- shallow (opencast) and deep-mined coal
- sand and gravel (superficial and bedrock)
- limestone
- igneous / metamorphic rock
- sandstone
- dolomite
- chalk
- common clay and shale, and fireclay
- silica sand
- other minerals including ball clay, china clay, fuller's earth, salt, peat, building stone, slate, gypsum, potash, fluorspar, barytes, and calcite.

CAVEATS ASSOCIATED WITH THE BGS MINERAL RESOURCE DATA

Mineral resources are natural concentrations of minerals, or bodies of rock, that are or may become of potential economic interest as a basis for the extraction of a commodity. They will exhibit physical and/or chemical properties and be present in sufficient quantity to be of intrinsic economic interest. Mineral resources depend not only on the physical presence of the mineral in question (minerals can only be worked where they occur) but also its potential judged against a wide range of economic criteria. These criteria include the price, costs of extraction, technical suitability for the market and indeed a demand for the mineral. These factors can change quite rapidly. Conversely, mineral resources can also be 'created' as changing economic circumstances widen the resource base and make possible the extraction and recovery of material which otherwise would not be attractive. Consequently, areas that may be of potential economic interest as sources of mineral are not static but change with time.

The identification and delineation of mineral resources is, therefore, inevitably somewhat imprecise as it is limited not only by the quantity and quality of data currently available but also involves predicting what might, or might not, become economic to work in the future. The assessment of mineral resources is, therefore, a dynamic process which must take into account a wide range of factors. These include geological reinterpretation as additional data becomes available, as well as the continually evolving demand for minerals, or specific qualities of minerals, due to changing economic, technical and environmental factors. Criteria used to define resources, for example in terms of mineral to waste ratios, also change with location

and time. Thus a mineral deposit with a high proportion of waste may be viable if located in close proximity to a major market, but uneconomic if located further away.

There is no presumption that any areas delineated within the mineral resource data set will ultimately be acceptable for mineral extraction. The data are intended for general consideration of mineral issues and not as a source of detailed information on specific sites. Knowledge of mineral resources within the UK is imperfect. Although the mineral resources data is based on a wealth of information on the geology of England and a reasonable understanding of the location and characteristics of many mineral deposits, detailed information on the full extent and nature of commercially viable mineral reserves is far from complete. It is here that further assessment would be required to fully assess the mineral potential of any particular resource polygon or specific site. For example, a mineral resource is not confirmed as economic until it is proved by a relatively expensive evaluation programme. Therefore, whilst Mineral Planning Authorities are increasingly utilising the digital mineral resource data provided by the BGS, they still also rely heavily on mineral operators to provide more local specific data, information and intelligence.

The mineral resource data has generally been very well received by mineral planners and is utilised by over 50 local authorities across all the regions of England. However, certain issues have arisen. For example, the creation of the mineral resource data relies on the BGS DigMapGB 1: 50 000 scale geological mapping. As DigMapGB is scale dependent, for certain lithological units, a lack of internal differentiation at 1:50 000 scale prevents better delineation of material present. For example, large areas of sandstone may contain within them geological units that are suitable for high specification aggregate (high PSV). However, due to the nature and scale of the mapping, whilst these units are known to exist they are not individually differentiated in the data. Therefore, an MPA may want to have specific safeguarding policies for the high PSV units but are unable to actually delineate these units on a map. Further work, at a larger scale, would be required in order to better differentiate the high PSV units.

When developing its proposed approach to apportionment, which includes a definition of accessible resource, the West Midlands Regional Assembly used as a starting point the mineral resource data. However, there was some evidence that there were gaps in the data (e.g. incomplete coverage of the Shropshire 'fault line' and southwest Herefordshire). Consequently, some Mineral Planning Authorities undertook further work with the BGS to map their resource more accurately.

BENEFITS OF THE BGS MINERAL RESOURCE DATA

By having digital GIS data available that specifically pertains to mineral resources makes it much easier for planners to identify mineral resources present in their area. This assists them in developing their planning documents and also, importantly, to safeguard mineral resources for the future according to the principles of sustainable development. In the wider context of sustainable development, mineral resource information is of increasing importance for resource management and land-use planning.

Now that the mineral resource data is being widely utilised, MPAs are increasingly requesting further assessment of the data for their particular area to establish the thickness of deposits and thus an indication of the volume of different mineral

resources present in order to inform their strategic planning and, for relevant resources, their aggregate apportionment.

By making the data available digitally, it can be manipulated and interrogated in a GIS environment. Other data can be overlaid, in order to assess levels of interaction. A particular advantage of holding all the information in digital form is that it is comparatively easy to update and revise as additional information becomes available or as the geological data source, DigMapGB, is enhanced. Any changes in administrative boundaries can also be easily accommodated. Whilst assisting the plan making process is a primary function of the mineral resources data, use is not limited to local authorities and it is also utilised by academia, private companies and individuals.