Oxfordshire Minerals and Waste Development Framework
Minerals and Waste Core Strategy

Background Paper revised April 2012

Safeguarding Mineral Resources

Note: This background paper was largely prepared prior to publication of the government's National Planning Policy Framework on 27 March 2012 and it has only been partially updated to reflect this new national policy document.

1. Introduction

1.1 This background paper is one of a series which together form part of the evidence base for the Minerals and Waste Core Strategy. The Core Strategy is part of the Minerals and Waste Plan that will set out a strategy and policies for where minerals should be worked and where waste should be managed in Oxfordshire over the period to 2030. More information about the plan can be found on the Council's website: www.oxfordshire.gov.uk

1.2 The background papers have been used to identify baseline data and inform the preparation of policies for inclusion in the Core Strategy. The papers are intended to present evidence as it stands at this stage. They build on work carried out previously, in particular the 2007 consultation on preferred options, incorporating feedback from that consultation and addressing areas that require further consideration. They also provide an opportunity for stakeholders to check the information to ensure the Council's knowledge and understanding is up to date and robust.

1.3 The background papers are 'living draft' documents and may continue to be revised throughout the process of preparing the Core Strategy.

1.4 This paper is part of the evidence base for the County Council's proposed policy for safeguarding mineral resources in Oxfordshire in the Minerals and Waste Core Strategy proposed submission document, which includes policy M6 on safeguarding mineral resources.

2. Executive Summary

2.1 Section 3 introduces the contents of the paper and describes the importance of aggregate minerals to the national economy.

2.2 Section 4 provides a brief description of national and regional policy on safeguarding. It refers to the British Geological Survey (BGS) guidance and its six step approach to creating an effective safeguarding system for minerals.

2.3 Section 5 provides a description of the mineral resources in Oxfordshire. It describes the use of the BGS mapping of resources as the basis for the identification of Minerals Safeguarding Areas (MSAs). It refers to appendix 1, which contains a profile for each of the minerals in the county. The section concludes with a table which presents a summary of reasons for the preliminary recommendation on safeguarding for each mineral resource.

2.4 The recommendations on safeguarding in this paper have been drawn up to inform the development of policy in the Core Strategy. The consultation draft Minerals Planning Strategy identifies the strategy for safeguarding; this strategy has been used as the basis for drawing up possible mineral safeguarding areas in this paper. MSAs will be identified in the Minerals Site Allocations Development Plan Document, based on the core strategy principles and policy, taking into account any comments made on this paper.

2.5 Appendix 1 contains a profile for each mineral type present in Oxfordshire. Each profile provides a brief description of the geology of that mineral, its main uses, options for safeguarding it and maps to show where the resource lies and a possible MSA for that resource if appropriate. The note of a meeting held in March 2011 with mineral operators to discuss safeguarding is at Appendix 2.

3. Aggregate minerals

3.1 Aggregate minerals are important national resources and adequate and steady supplies are vital for developing and sustaining our society. Aggregates are vital to the construction industry which maintains and enhances our built environment and infrastructure. Minerals can only be worked where they occur so with increased pressure on land use in the UK mineral planning authorities must ensure that potentially important minerals are not needlessly sterilised by other development.

3.2 The core strategy mineral planning objectives include a reference to safeguarding minerals for future development. Objective ix is to:

'Safeguard resources of sand and gravel, crushed rock, building stone and Fuller's Earth to ensure that these resources are potentially available for future use and are considered in future development decisions;'

3.3 The Minerals and Waste Core Strategy proposed submission document includes a policy (M6) which sets out a strategy for mineral safeguarding, including those minerals resources which should in principle be safeguarded; but it does not identify MSAs. Based on this policy, using the information in this paper, and taking into account any comments received on it, MSAs will be identified subsequently in the Minerals Site Allocations Development Plan Document. Mineral Consultation Areas (MCAs) will also be identified based on the MSAs.

3.4 Boxes 1 and 2 explain of some of the terms used in this report.

Box 1 Mineral Safeguarding Areas (MSAs)

MSAs are areas of known mineral resources that are of sufficient economic or conservation value to warrant protection for generations to come. The level of information used to prove the existence of a mineral resource can vary from geological mapping to more in depth geological investigations.

Defining MSAs carries no presumption for extraction and there is no presumption that any areas within MSAs will ultimately be environmentally acceptable for mineral extraction. The purpose of MSAs is to ensure that mineral resources are adequately and effectively considered in land-use planning decisions, so that like other finite resources, they are not needlessly sterilised, compromising the ability of future generations to meet their needs. MSAs will make relevant parties aware of the presence of mineral resources; and specific local planning policies will be applicable to those areas. The presence of an MSA does not necessarily preclude other forms of development; but it provides an alert to the fact that there are potentially important mineral deposits within the area which may be sterilised by proposed development and that this should be taken into account in the planning process.

All Mineral Planning Authorities should include policies and proposals to safeguard mineral resources within MSAs and show them in their Development Plan Documents (DPDs), to alert prospective applicants for planning permission to the existence of potentially valuable mineral resources and to show where local mineral safeguarding policies apply. In two-tier areas, MPAs must pass information on the location of MSAs to the district councils, and MSAs must be shown on the proposals maps in district LDFs.

Box 2 Mineral Consultation Areas (MCAs)

MCAs are a mechanism to ensure that in two-tier authority areas consultation takes place between district and county planning authorities when mineral interests could be compromised by non-mineral development. The definition of MCAs is not obligatory, but consultation within an MCA is. They are a useful additional method of supporting mineral safeguarding by facilitating discussion between respective authorities.

MCAs also give an additional measure of safeguarding to sites relating to minerals infrastructure, such as wharves and railheads that cannot be protected by MSAs which should only be defined to protect the resource itself.

MCAs can be updated more easily than MSAs as their statutory basis is outside that of the development plan. They can therefore be responsive to the latest information on geology mineral economics and other development. A regularly updated and used set of MCAs can complement the protection of mineral interests facilitated by MSAs.

4. Policy Context

4.1 A number of policy documents provide national policy on safeguarding. Minerals Policy Statement 1: Planning for Minerals (DCLG, 2006)[1] outlines the national policy for safeguarding minerals resources. One of the Government's objectives for minerals planning is to safeguard mineral resources as far as possible. Paragraph 10 goes on to state that to achieve this objective, MPAs should carry out their planning functions in accordance with the national policies for minerals safeguarding set out in Paragraph 13, as follows:

- *Define MSAs in LDDs[2], in order that proven resources are not needlessly sterilised by non-mineral development, although there is no presumption that resources defined in MSAs will be worked;*
- *Encourage the prior extraction of minerals, where practicable, if it is necessary for non-mineral development to take place in MSAs;*
- *In two-tier planning areas, include policies and proposals to safeguard mineral resources within MSAs in county LDDs and show MSAs in District LDDs. Counties should define MCAs based on their MSAs. MCAs should also be reflected in district LDDs. Where a planning application is made for non-mineral development within a MCA, the district should consult the county on the application;*
- *District councils responsible for spatial planning of land defined in MSAs should not normally include policies and proposals in*

[1] Minerals Policy Statement 1: Planning for Minerals

[2] An LDD is a Local Development Document which includes all documents that make up the Minerals and Waste Development Framework.

their LDDs for non-minerals development in those areas, or sensitive development around safeguarded mineral areas, where such policies would affect the potential for future extraction of minerals.

4.2 Planning Policy Statement 12: Local Spatial Planning[3] sets out the government's policy on the preparation of local development frameworks, including minerals and waste development plan documents. The key development plan documents in a Minerals and Waste Development Framework are:

- Core strategy, including a key diagram spatially outlining the broad strategy;
- Site specific allocations of land;
- Proposals map, which illustrates the spatial extent of policies on an Ordnance Survey map or similar

4.3 It is stated in PPS 12 that '*spatial planning is…critical in relation to economic growth and regeneration by…providing a robust basis for assessing the need for, and providing supporting infrastructure and natural resources for economic development.'* (Para 2.5)

4.4 Reference is made in PPS 12 to mineral safeguarding. In two tier authority areas, '*district planning authorities should include on their adopted proposals map, minerals and waste matters including safeguarding areas.'* (Para 8.2)

4.5 The government's National Planning Policy Framework (NPPF) was published on 27 March 2012 and has replaced MPS 1 and PPS 12 with immediate effect. The NPPF states that;
'Local Planning Authorities should define Mineral Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas.'

4.6 The Regional Spatial Strategy, the South East Plan[4], adopted in May 2009 is part of the statutory development plan for Oxfordshire. The Coalition Government has stated its intention to revoke all regional strategies, and this is provided for in the Localism Act 2011.

4.7 Policy M5 of the South East Plan[5] requires MPAs to identify and safeguard existing mineral sites, proposed sites and 'areas of search' in mineral development documents for the extraction of aggregates, clay, chalk, silica sand and gypsum. MPAs should also assess the need for wharf and rail facilities for the handling of distribution of

[3] Planning Policy Statement 12: Local Spatial Planning (CLG, 2008)
[4] Government Office for the South East (2009) The South East Plan: Regional Spatial Strategy for the South East of England
[5] Regional Spatial Strategy for the South East: South East Plan (May 2009)

imported mineral and processed materials, and identify strategic sites in their minerals development frameworks to be safeguarded from other inappropriate development. The plan also notes that existing mineral working and processing plants which have regional significance should also be protected from other development and further consideration given to extending safeguarding arrangements to larger known resources which are not specifically allocated in mineral development documents.

4.8 Mineral safeguarding areas should be based upon the best available geological and minerals resource information (MPS1: Practice Guide, Para 32)[6]. 'Mineral safeguarding in England: good practice guidance', British Geological Survey, 2011[7] has been published to complement national planning policy for minerals in MPS1 (superseding the original, 2007 guidance). This provides guidance on how mineral safeguarding policy can be complied with. It outlines a step by step methodology for defining Mineral Safeguarding Areas; Box 3 outlines the 7 steps to creating an effective safeguarding system for minerals.

Box 3 Step by step approach to creating an effective safeguarding system for minerals	
Step 1	Identify the best geological and mineral resource information
Step 2	Decide which mineral resources to safeguard and the physical extent of MSAs
Step 3	Undertake consultation on draft MSAs
Step 4	Decide on the approach to safeguarding in the Core Strategy
Step 5	Include development management policies in a DPD
Step 6	Include safeguarding in district level DPDs
Step 7	Include mineral assessments in the local list of information requirements

4.9 This paper covers the first parts of this process. The Minerals and Waste Core Strategy proposed submission document includes the principles for the designation of MSAs; the boundaries of these areas will be identified subsequently in the Minerals Site Allocations document.

[6] MPS 1: Practice Guide (CLG, 2006)
[7] BGS: A Guide to Mineral Safeguarding in England (McEvoy et al, 2007)

5. Strategic options

5.1 Oxfordshire is rich in mineral resources. The maps at appendix 1 show that there are extensive alluvial sand and gravel resources along the River Thames and its tributaries, smaller deposits of fluvio-glacial sand and gravels in the north east of the county, deposits of soft sand mainly in the south west and extensive areas of limestone and of ironstone in the north west and north. The Chilterns and the North Wessex Downs form an extensive outcrop of chalk in the south of the county. There are extensive deposits of clays running across the county, between the chalk and the limestone outcrops. In the south west of the county in the Vale of White Horse there is a small but nationally important deposit of fuller's earth. There are deposits of coal at depth beneath much of the county, which may contain coal bed methane. For the purposes of considering safeguarding, Oxfordshire has 8 distinct mineral resources:

- Sharp sand and gravel
- Soft sand
- Limestone
- Ironstone (marlstone rock formation)
- Chalk
- Fuller's earth
- Clay
- Coal and coal bed methane

5.2 The BGS resource map[8] is the best information that is generally available but in most cases only a fraction of the mineral deposit has actually been drilled and tested. There are likely to be many areas identified as a 'proven resource' on this map that would not be economically viable to work. Also, many areas of identified mineral deposits may be unsuitable for working for environmental reasons. The BGS map should, however, be used as the starting point for defining MSAs, unless better data is available from other sources such as the minerals industry.

5.3 For each mineral, a profile of the geology, past and current extraction, main uses, future prospects, options for safeguarding and preliminary conclusions is set out in Appendix 1. For sand and gravel and limestone, a number of distinct resource areas exist which raise different safeguarding issues. Safeguarding options considered range from including most if not all of the resource, to restricting safeguarding areas to current workings, potential extensions and known prospects where they exist. Safeguarding the whole resource would seem appropriate where potentially workable economically important resources are of limited extent. Where this is not the case, for instance with the extensive limestone resource, a more restricted approach is suggested.

[8] British Geological Survey, DiGMapGB-100 (Mineral Resources) for Oxfordshire

5.4 As well as the potential for development in MSAs to sterilise resources, development adjacent to the MSAs could also indirectly lead to sterilisation. Buffer zones may need to be identified around MSAs to ensure that non-compatible development does not sterilise any of the resource. These buffer zones could be included in subsequently identified MCAs.

5.5 Table 1 summarises the preliminary conclusions on safeguarding, with reasons, for each mineral and Table 2 presents this by safeguarding option.

Table 1: Preliminary safeguarding conclusions and reasons by mineral

Mineral	**Summary of preliminary conclusions on safeguarding and reasons**
Sand and gravel – river terrace and sub-alluvial deposits: Thames, Lower Evenlode, Lower Windrush & Lower Thame valleys.	Sand and gravel resources should all be safeguarded due to their potential to provide strategic resources in the long term.
Sand and gravel – river terrace and sub-alluvial deposits: Cherwell, Ock valleys and minor tributaries	As much of this resource is intermittent, thin or has a high silt content, no MSAs identified at this stage but potential for subsequent review if the need arises and economically proven resources are identified. .
Sand and gravel: glaciofluvial deposits	Two areas of glacio-fluvial resource should be safeguarded; an area in the north east and an area in the south east of the county.
Soft sands	This resource has a large spatial extent; the preliminary recommendation is to limit the identification of MSAs to areas around existing workings and permissions and other locations where resources are proven or where the industry has indicated there are likely to be workable resources.
Limestone: Middle Jurassic Great Oolite Group (Chipping Norton and White limestones); Upper Jurassic Corallian Group (Highworth and Stanford limestones and Coral Rag)	Due to the extensive area it covers, the preliminary recommendation is to limit the identification of MSAs to areas around existing workings and permissions. Other locations where resources are proven or where the industry has indicated there are likely to be workable resources outside the Cotswolds AONB should also be safeguarded.
Ironstone (Marlstone rock formation)	Due to the extensive area it covers, safeguarding should be limited to existing quarries, permitted reserves and areas subject to review of mineral permissions (ROMPs).
Fuller's earth: occurs in Lower Greensand, mainly between Fernham and Baulking	This is a nationally scarce and potentially important mineral with a number of industrial uses. The proven area of resource between Fernham, Baulking and Moor Mill Farm should therefore be safeguarded.
Chalk: high and low purity	Chalk is not a mineral of economic value in Oxfordshire and is not currently worked. At present it is recommended that it is not safeguarded, particularly in view of the extensive deposits that exist, but this can be reviewed in the future if working recommences.
Clay (Oxford, Kimmeridge and Gault formations)	Currently there are no clay brick or tile manufacturing sites in Oxfordshire and the only working of clay in recent years has been from sand and gravel quarries, for landfill engineering material. In view of the extensive deposits of clay that exist, it is recommended that this mineral should not be safeguarded at this time, but this can be reviewed in the future if the situation changes materially.`
Coal and Coal bed methane	The Oxfordshire-Berkshire coalfield is formed of Carboniferous rocks lying at depths of between 300 and 1500 metres. The coal measures succession is considered to be unprospective for Coal Bed Methane because of its low gas content. It does not need to be safeguarded. The coal seams are thin and are of no current economic interest.

Table 2: Strategic Safeguarding options preliminary conclusions

Minerals where it is recommended that all of the resource identified should be safeguarded are:
• Sand and gravel: river terrace and sub-alluvial deposits – R Thames, Lower Evenlode, Lower Windrush & Lower Thame valleys.
Minerals where safeguarding should be limited to areas around existing workings and permissions and other locations where resources are proven or where the industry has indicated there are likely to be workable resources.
• Sand and gravel: river terrace and sub-alluvial deposits – Cherwell & Ock valleys and minor tributaries, Faringdon sponge gravels • Sand and gravel: glaciofluvial deposits • Soft sands: Horsehay formation, Kingston formation & Lower Greensand • Limestone: Middle Jurassic Great Oolite Group (Chipping Norton and White limestones); Upper Jurassic Corallian Group (Highworth and Stanford limestones and Coral Rag) • Fuller's earth, Fernham – Baulking – Moor Mill Farm
Minerals where safeguarding is limited to existing sites, permitted reserves and areas subject to Review of Mineral Permissions (ROMPs)
• Ironstone (Marlstone rock formation)
Minerals where no safeguarding appears to be justified:
• Chalk, low and high purity • Clay (Oxford, Kimmeridge and Gault formations) • Coal and Coal bed methane

5.6 A meeting was held with mineral operators on 1 March 2011 to discuss a draft of this paper. A note of that meeting is at Appendix 2. Some changes were made to the paper in response to points made at the meeting, but other points have not been addressed at this stage, as detailed in Appendix 1.

5.7 This paper has been further revised further in response to comments received when it was published alongside the consultation draft Minerals Planning Strategy in September 2011. Changes include amendments to the maps in appendix 1 to ensure consistency between the draft plan and the information on safeguarding in this paper. The policy section has now been revised to refer to the National Planning Policy Framework.

APPENDIX 1

Mineral Profile 1

1. SHARP SAND AND GRAVEL

Geology

1.1 Sand and gravel resources can be sub-divided into river terrace and glaciofluvial resources. Map 1.1 shows the location of sand and gravel resources in Oxfordshire.

1.2 River terraces of sand and gravel occur at several levels in the Thames, Evenlode, Windrush and Thame valleys and minor tributaries. This mineral comprises unconsolidated materials laid down by rivers and streams since the end of the last ice age about 10,000 years ago. River terrace deposits are an important resource in the county since they generally have a low clay content. The older terraces are higher above the present course of the river and are generally dry in their upper parts. Younger terraces can be saturated at their bases. The deposits comprise sequences of sands and gravels with sheet-like morphology, sub-horizontal upper surfaces and thicknesses of up to a few metres. The gravels of the Upper Thames, Windrush and Evenlode valleys are predominantly limestone based and those south of Dorchester and in the Thame valley are predominantly flint.

1.3 Deposits of glaciofluvial sand and gravel are located in the north east of the county and in an area east of Wallingford, along the foothills of the Chiltern Hills. These were deposited by glacial melt-waters during the ice ages the last of which ended around 10,000 years ago.

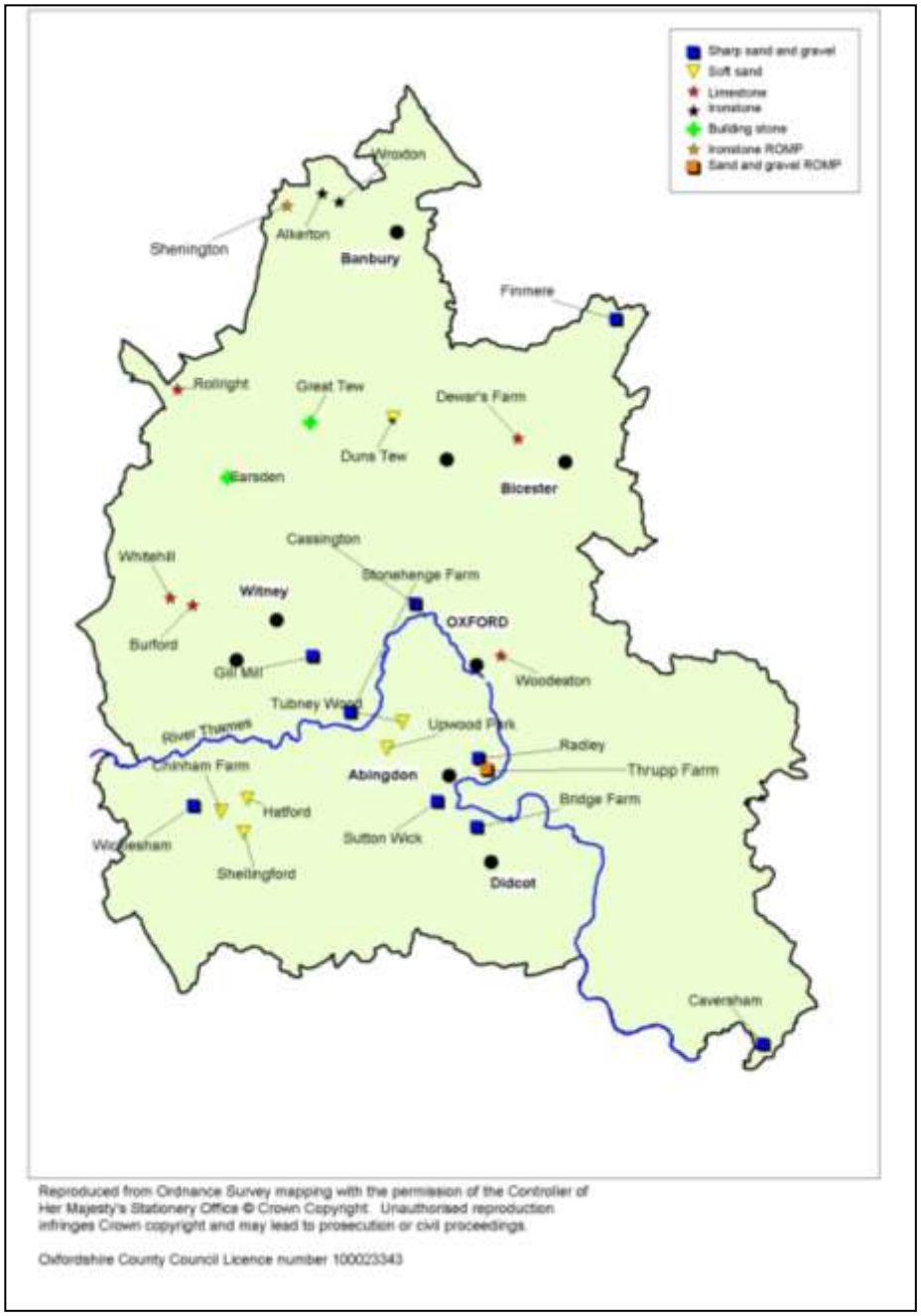
1.4 Glaciofluvial sand and gravels are likely to contain flint and quartzite gravels which are arguably of higher quality than limestone gravels, although their quality can be variable. Such deposits have been worked in the past at Ewelme. There is a production unit with permitted reserves in the north east of the county, close to the Buckinghamshire border.

Main uses

1.5 The principal uses of sand are as fine aggregate in concrete, mortar and asphalt. The main use of gravel is as coarse aggregate in concrete. Most of the county's production serves markets in Oxfordshire, the remainder supplying neighbouring counties.

1.6 The map at figure 1 shows the location of existing quarries in Oxfordshire.

Figure 1: Existing mineral workings in Oxfordshire



Long term prospects

1.7 The County's sand and gravel resources are extensive and are located along most of the Thames valley and its major tributaries. To date, working has been concentrated west and south of Oxford and this has had a profound and lasting impact on the landscape in some areas such as the Lower Windrush Valley. There are still significant, economically viable resources in the Thames, Lower Windrush, Lower Evenlode and Lower Thame valleys. No working has taken place in the far west of the county to date.

1.8 In the south of the county there are large areas of alluvial sand and gravel associated with the River Thame and the Thames. There has been much previous working in this part of the county but there are still extensive sand and gravel resources.

1.9 Sand and gravel resources associated with minor tributaries of the Thames such as the River Cherwell in the north of the county and the River Ock in the south west are incidental in nature and of no strategic importance. They are either limited in spatial extent, are thin and/or have a high silt content.

1.10 The glaciofluvial deposits are only currently worked at one quarry in the north east of the county although they are also found in an area in the south east of the county. These deposits may be needed in the future when deposits which are easier to work are exhausted.

Safeguarding options

1.11 A distinction needs to be made between the main river valley deposits which are of strategic importance and the deposits of the upper river valleys and minor tributaries which are not. For each of these resources three options are considered.

Main river valleys: Thames, Lower Windrush, Lower Evenlode, Lower Thame

Option 1 – Safeguard all these resources

1.12 It is reasonable to assume that any significant resource area which is not unduly constrained by environmental or other factors could at some time in the future be of commercial interest for mineral extraction. Safeguarding the whole resource will enable an assessment to be made as to whether any particular part of it should be safeguarded for possible future mineral extraction in the event of a proposal for other development, or whether it would be reasonable in the particular circumstances for the development to go ahead and for the mineral to be sterilised. The fact that most of these sand and gravel resources are within the floodplain should in practice reduce the likelihood of other development being proposed within them, thus minimising the number of occasions when such assessments have to be made.

1.13 There may be some scope to significantly reduce the extent of the safeguarded area along the River Thame and the River Evenlode. The resources in the upper reaches of the Thame valley north of Stadhampton are intermittent and are unlikely to warrant safeguarding. Similarly north of Long Hanborough, there is little resource and no history of working; the resource only warrants safeguarding south of Long Hanborough village to its confluence with the River Thames east of Eynsham.

Option 2 – Safeguard only areas where nominations for extensions to existing sites or new sites have been made, where the resource is proven

1.14 MSAs could be limited to potential extensions to existing quarries and land nominated by the industry and landowners that has been tested and is available. This option would be more focused and is less likely than option 1 to include land which has little chance of ever being worked. However, this approach is more likely to become out of date – the minerals industry is always looking to acquire and test more land and options on land may be temporary. This approach also lacks the long term perspective that should be a key feature of safeguarding policy, and risks mineral deposits of potential importance for the future being sterilised by other development.

Option 3 – SE Plan policy approach

1.15 SE Plan Policy M5 states that:

'Existing mineral sites, proposed sites and areas of search should be identified in mineral development documents….and should be safeguarded in local development documents'.

1.16 This option would mean that MSAs are even more limited in their spatial extent than under Option 2 and would only safeguard the land identified for mineral extraction during this plan period, not beyond it. This option therefore lacks the long term perspective even more so than Option 2.

Minor river valleys: Cherwell and Ock valleys and minor tributaries

Option 1 – Safeguard the entire resource

1.17 The minor river valley deposits are quite extensive but they are generally of limited extent, are thin or of uncertain depth, and are of variable, uncertain and often poor quality. Consequently their economic potential when other areas of resource are easier to work is likely to be very limited.

Option 2 – Limit safeguarding to any economic resources that have been identified

1.18 If evidence comes forward that significant deposits of potential economic interest exist within any of these resources then it would be reasonable to safeguard these specific areas.

Glaciofluvial sand and gravel

Option 1 – Safeguard the entire resource

1.19 This would involve defining MSAs which have a large spatial extent but are not of any real economic interest. There seems little benefit in this approach as it would include many areas where the case for safeguarding would be likely to be weak.

Option 2 – Limit safeguarding to resources proven by industry

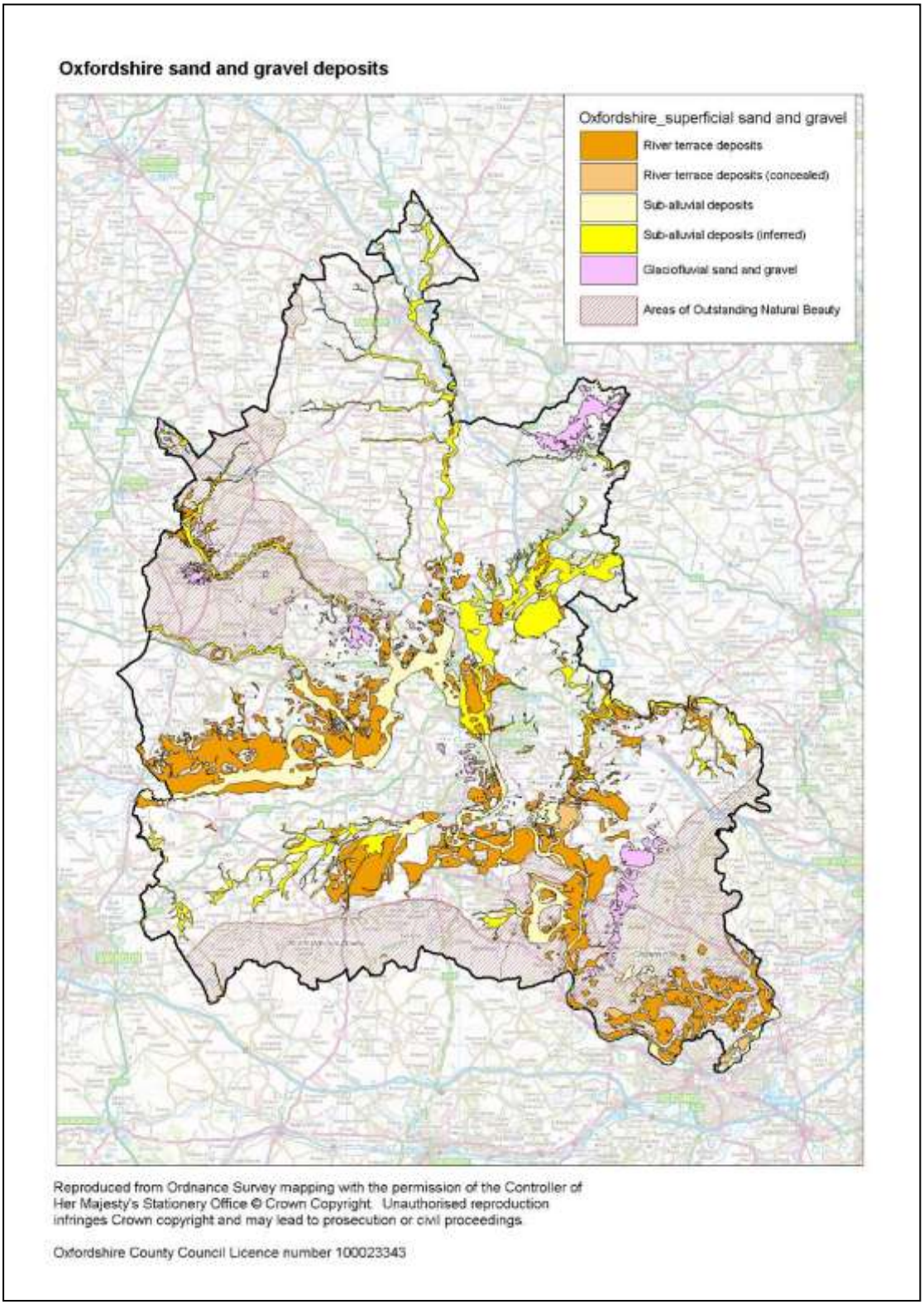
1.20 Resources are known to exist in the vicinity of Finmere Quarry in the North East of the county and in the Ewelme area in the south east of the county. Due to the high quality of this resource, it would be reasonable to safeguard these two areas to meet future needs for sand and gravel.

Safeguarding sand and gravel – conclusions

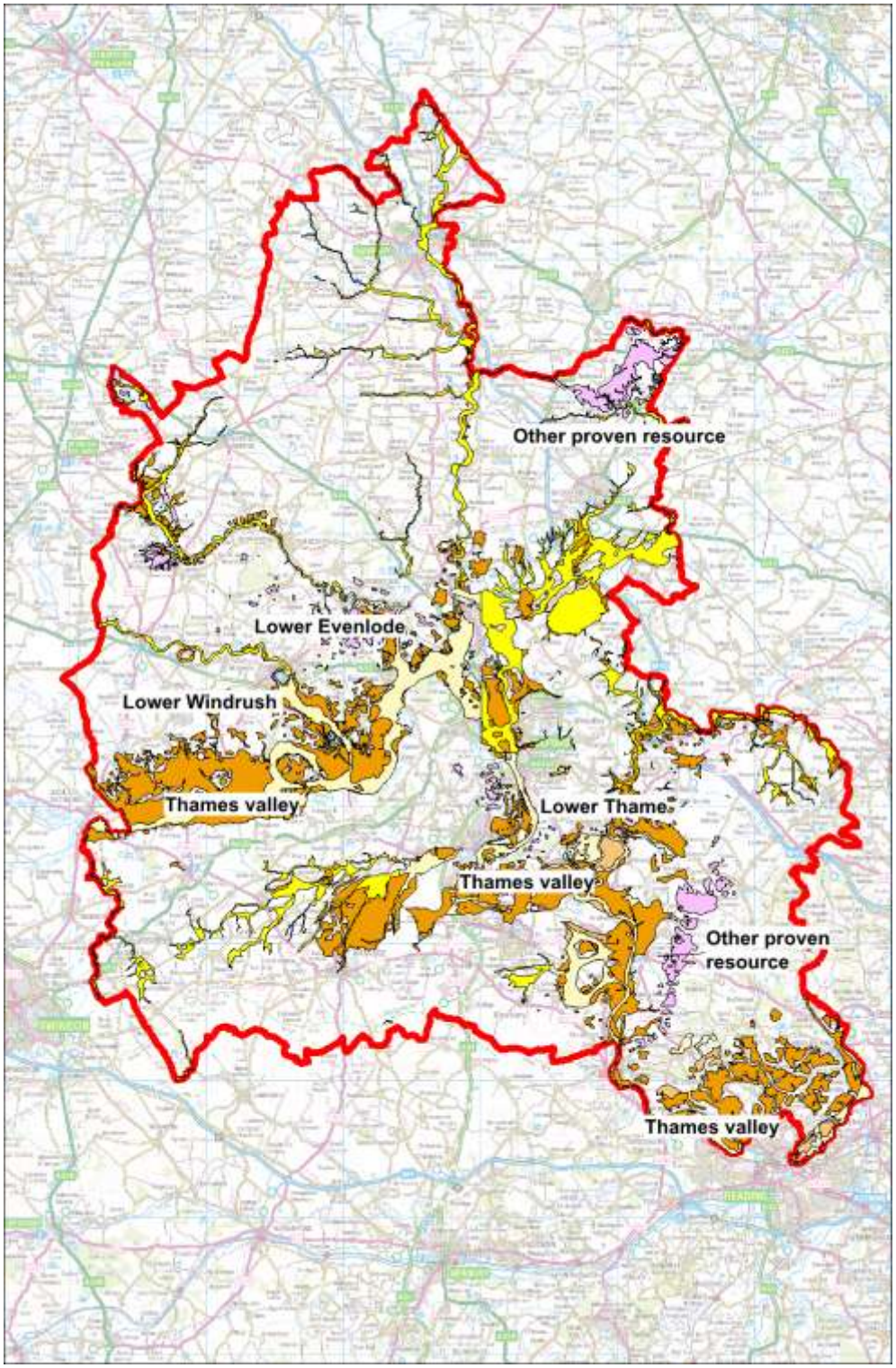
1.21 The preliminary conclusions are that for river terrace gravels, the main river valleys, resource along the Thames, the Lower Windrush, the Evenlode south of Hanborough and the Thame south of Stadhampton should be safeguarded. Resources along the minor river valleys should only be safeguarded if they are proven to be economically viable; at present it is considered that these resources should not be safeguarded, but this can be subject to review in the future.

1.22 For glaciofluvial sand and gravels, the preliminary conclusion is that two areas, one in the north east of the county and one in the south east, should be safeguarded. Map 1.2 shows the preliminary conclusions for safeguarding river terrace and glaciofluvial sand and gravels.

Map 1.1 Surface sand and gravels



Map 1.2 Sand and gravel resources – main river valleys and other areas of proven resource annotated



Mineral Profile 2

2. SOFT SAND

Geology

2.1 There are several formations of poorly consolidated sandstone in Oxfordshire which are worked for building sand. Map 2.1 shows the soft sands in the county. The Horsehay sand formation outcrops in a limited area in the north of the county. It consists of a medium to fine grained quartzose sand up to 7m thick.

2.2 The Kingston formation outcrops in the southern part of Oxfordshire and runs west-south-west to east-north-east from Faringdon to the north east of Oxford. The whole formation is up to 30m thick, although the principal resource, the Highworth Grit is only part of the formation and probably has a maximum thickness of 10-20m. The Highworth Grit consists mainly of medium-grained quartzose sand and is currently quarried in the Hatford/Shellingford and Tubney areas.

2.3 The Faringdon Sponge Gravel Formation outcrops in a small area near Faringdon and comprises red and yellow sponge gravels overlain by clayey sands and capped by ferruginous sands and sandstones. It is quarried to the south of Faringdon. Although not classified as a soft sand resource, comprising mainly coarse (sharp) sand and gravel, it does yield some soft sand.

Main uses

2.4 Soft sand is mainly used as an aggregate in the building industry for producing mortars and plasters and in the manufacture of asphalt and macadam.

Future Prospects

2.5 There are established markets for soft sand both in Oxfordshire and outside the county and there are small amounts of specialist sands which are used further afield. Soft sand now accounts for 20% of the sales of sands and gravels in Oxfordshire.

Safeguarding

2.6 There are two options for safeguarding soft sand resources.

Option 1 – Safeguard all resources

2.7 This would involve defining quite extensive MSAs which include resource where there is no proven economic value and where historically working has not taken place.

Option 2 – Limit safeguarding to potential extensions to existing soft sand quarries, permitted reserves and other locations where resources are proven or where the industry has indicated there are likely to be workable resources.

2.8 MSAs could be limited to potential extensions to existing quarries, permitted reserves and other locations where resources are proven by industry. This option would be more focused and is less likely than option 1 to include land which has little chance of ever being worked. However, in order to ensure that this approach does not become out of date, areas which are wider than simply those which have been nominated should be safeguarded.

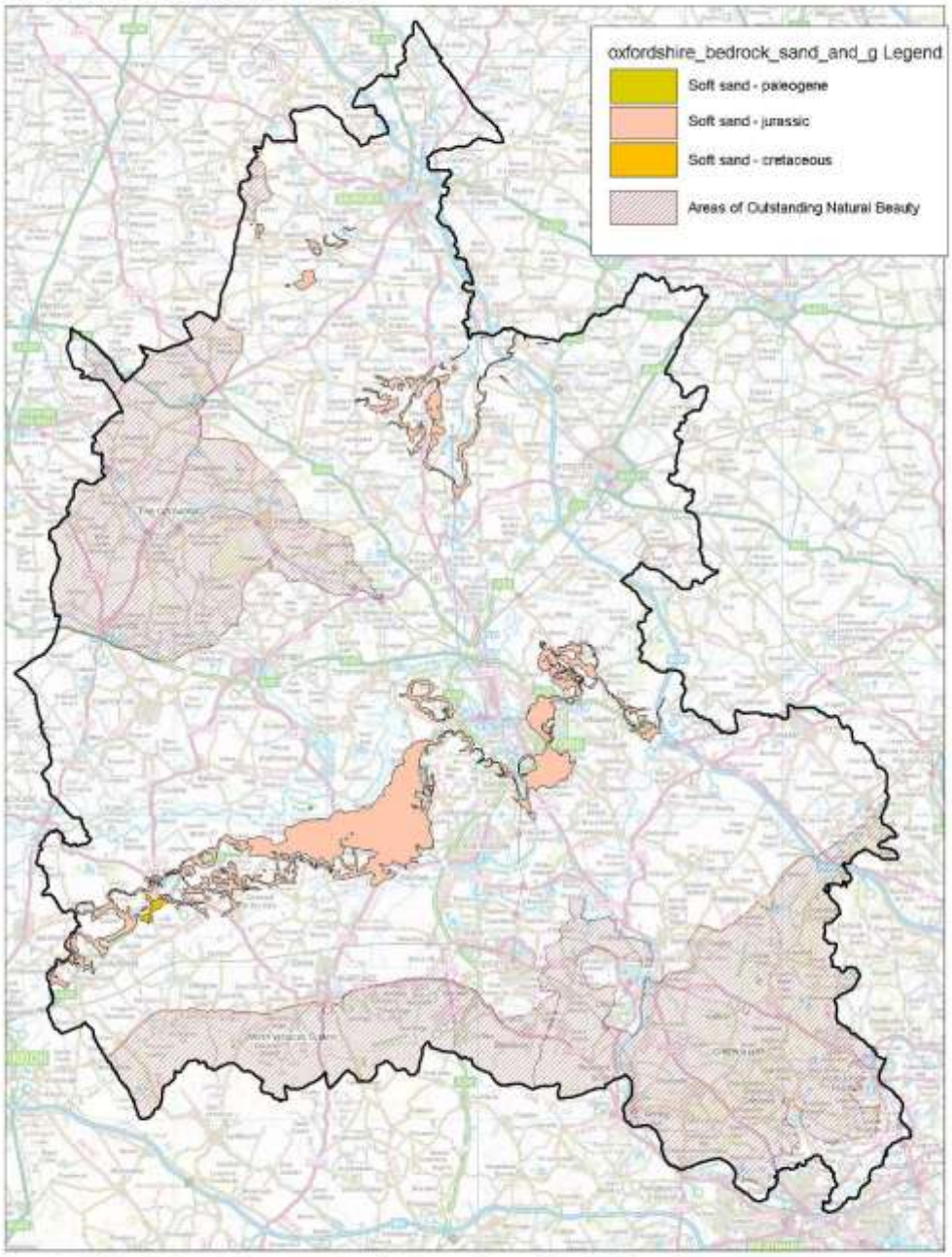
Safeguarding soft sand – preliminary conclusions

2.9 The preliminary conclusion is that soft sand in existing areas of working; east and south east of Faringdon, north and south of the A420 to the west of Abingdon and at Duns Tew should be safeguarded. At a meeting with mineral operators in March 2011, it was suggested that, in addition to the areas of soft sand identified based on the BGS surface mapping of the resource, further areas of concealed deposits at Boars Hill and at Duns Tew should also be safeguarded. At present the County Council has no better data than the BGS mapping and therefore the extent of the safeguarded areas has not been changed. This could be reviewed if further geological information becomes available. The note of the meeting with the operators is at Appendix 2

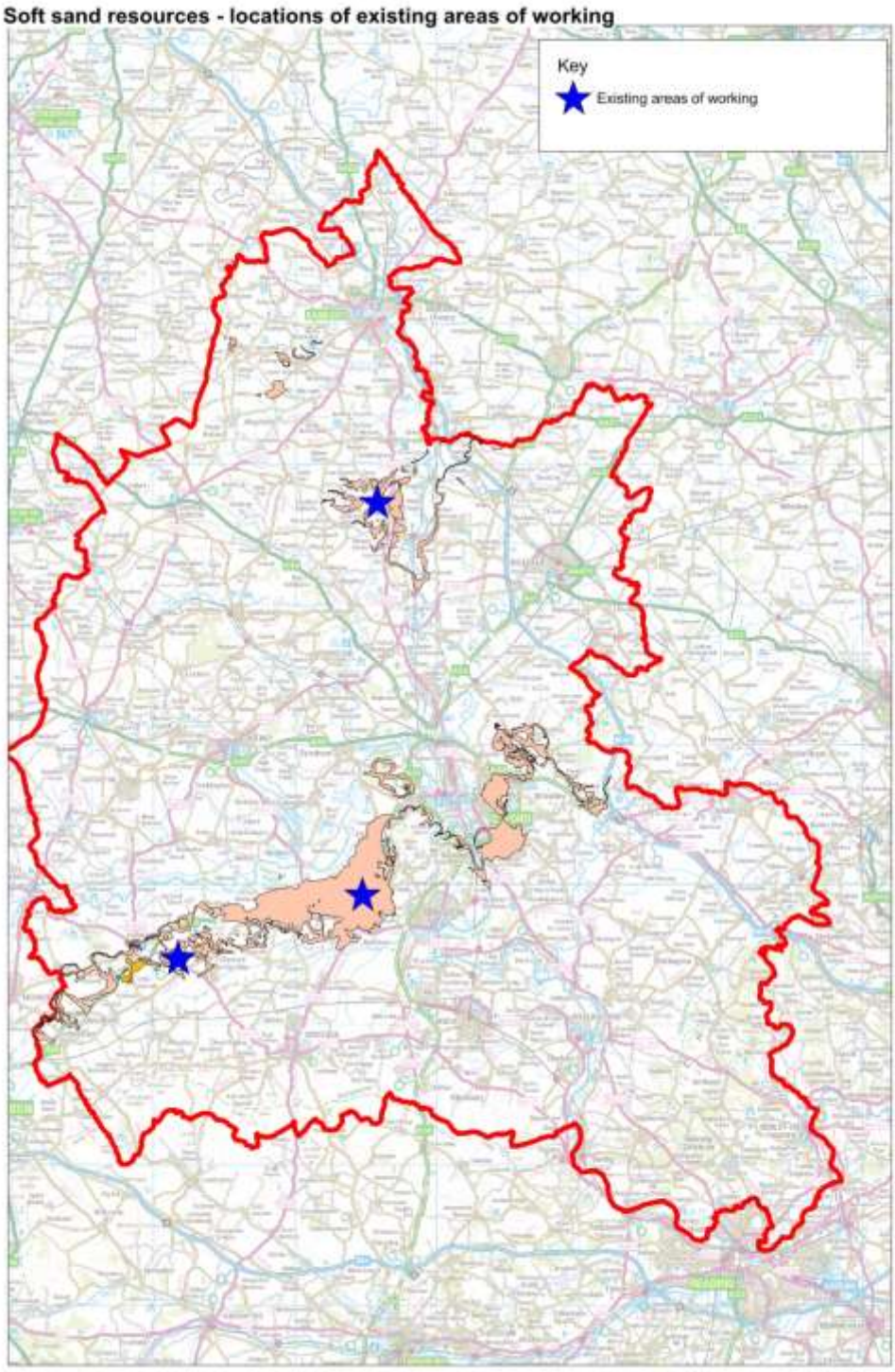
210 Map 2.2 shows the preliminary conclusions for safeguarding soft sand.

Map 2.1 Soft sand resources in Oxfordshire

Oxfordshire bedrock sand deposits



Map 2.2 Preliminary conclusions on safeguarding soft sand



Mineral profile 3a

3. LIMESTONE AND IRONSTONE: AGGREGATE

Geology

3.1 Map 3.1 shows the limestone and ironstone resources in Oxfordshire. The Great Oolite group runs north east to south west across northern Oxfordshire. It includes the Chipping Norton limestone which is a medium- to coarse grained oolitic limestone forming an extensive plateau, which is up to 10.7m thick near Chipping Norton. It thins towards the north east and east. White limestone, which is cream coloured and fine grained, outcrops extensively across Oxfordshire and is currently worked in quarries in the north east of the county at Ardley and far west of the county near Burford, primarily for aggregate use.

3.2 The limestone within the Corallian group (a mix of limestones, sands and mudstones) runs across southern Oxfordshire from east of Oxford to Shrivenham in the south west. These are lower quality limestones, which lie above and are worked in association with sands of the Kingston formation near Faringdon and which were historically considered as overburden. At Hatford, a harder limestone, the Highworth limestone, which meets Type 1 specification is quarried at depth (below the sand).

3.3 Ironstone occurs in the Marlstone Rock Formation, which is worked in the north of the county, particularly to the west of Banbury.

Main uses

3.4 Limestone and ironstone are used for crushed rock aggregates and for building stone.

3.5 Limestone is worked for aggregates in the far west of the county near Burford, just outside the Cotswolds AONB, near Ardley in the north east of the county and in association with soft sand in the Faringdon area.

3.6 Ironstone is extracted for aggregate use at quarries in the far north west of the county, north west of Banbury.

Long term prospects

3.7 There are extensive limestone and ironstone resources in the county and there is likely to be a long term demand for crushed rock in general. There are significant reserves of ironstone covered by old planning permissions in the north west of the county which are not being worked at present as they are the subject of stalled Reviews of Mineral Permissions (ROMPs).

Safeguarding options; aggregate uses

3.8 There are two options for safeguarding limestone and ironstone for aggregate uses.

Option 1a– Safeguard all of the limestone resource

3.9 MSAs based on all of the limestone resource shown on the BGS map would cover large areas and would include unproven resources and resources within the Cotswolds AONB which are unlikely to be worked for aggregate uses. There seems little benefit in this approach as it would include extensive areas where the case for safeguarding would be weak.

Option 1b – Limit safeguarding to existing limestone quarries and permitted reserves,

3.10 This option would enable limestone MSAs to be concentrated on areas of resource where industry has proven that economic resources exist, but would not be limited to individual sites. This option would provide a long term perspective, safeguarding resources for future possible use, without identifying areas where the resources are not proven.

Option 2a – Safeguard all of the ironstone resource

3.11 The spatial extent of the ironstone resource is more limited to the north west of the county. However, there are still some areas where resource is not proven and there is no history of working and therefore it may be difficult to justify the inclusion of all resource shown on the BGS map.

Option 2b – Limit safeguarding to existing ironstone quarries, permitted reserves and areas subject to Reviews of Mineral Permissions (ROMPs)

3.12 This option would enable ironstone MSAs to concentrate on areas of resource where industry has proven that economic resources exist, but would not be limited to individual sites. This option would provide a long term perspective, safeguarding resources for future possible use, without identifying areas where the resources are not proven.

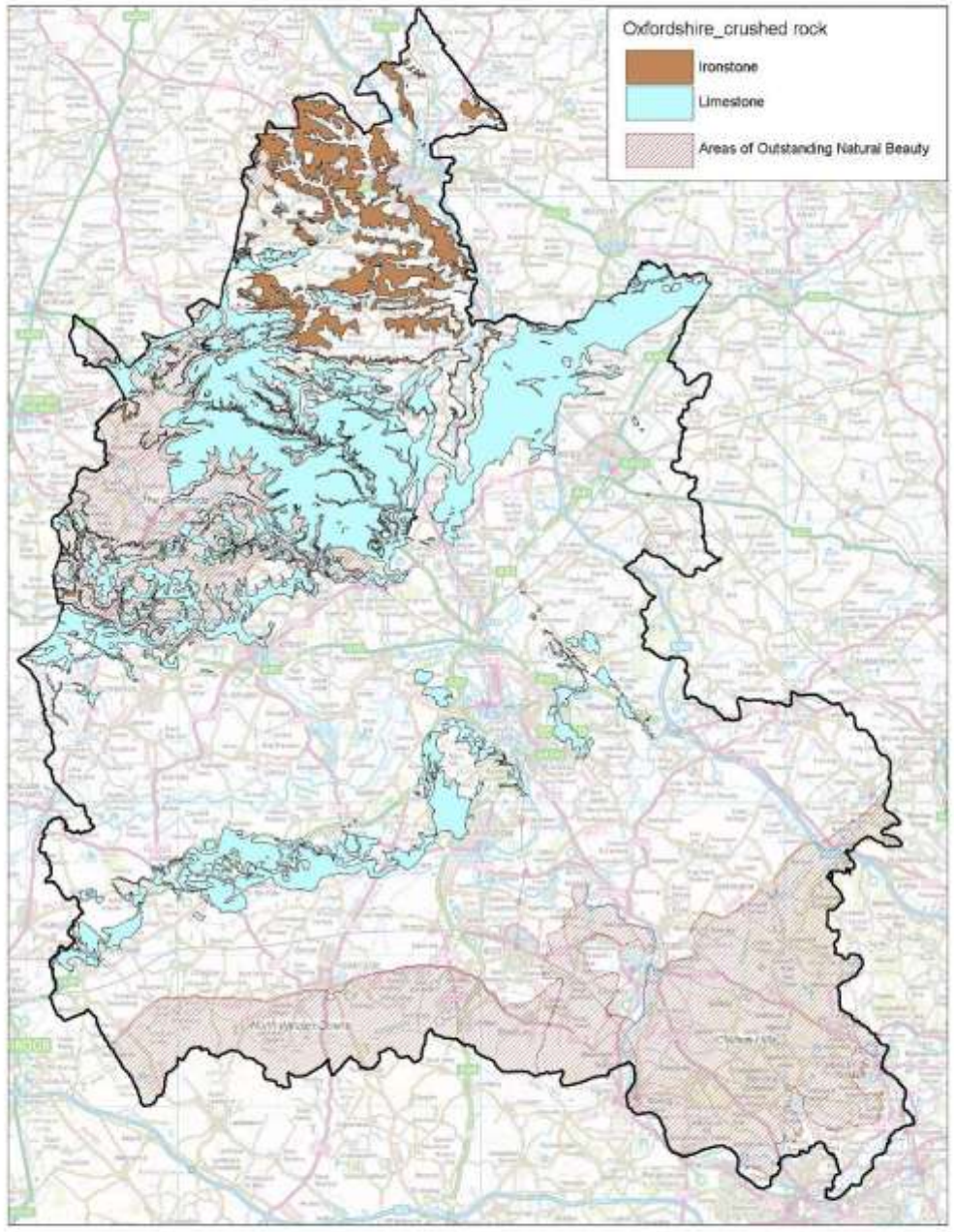
Safeguarding limestone and ironstone for aggregate uses – preliminary recommendations

3.13 For both limestone and ironstone, the preliminary conclusion is that safeguarding should be limited to existing areas of working; this includes ironstone working in the Alkerton area as well as the existing areas of limestone working located; north of Bicester to the east of the River Cherwell, south of the A40 near Burford, and east and south east of Faringdon. At a meeting with mineral operators in March 2011, it was suggested that the proposed MSA for limestone should not exclude the AONB and that this planning constraint should be

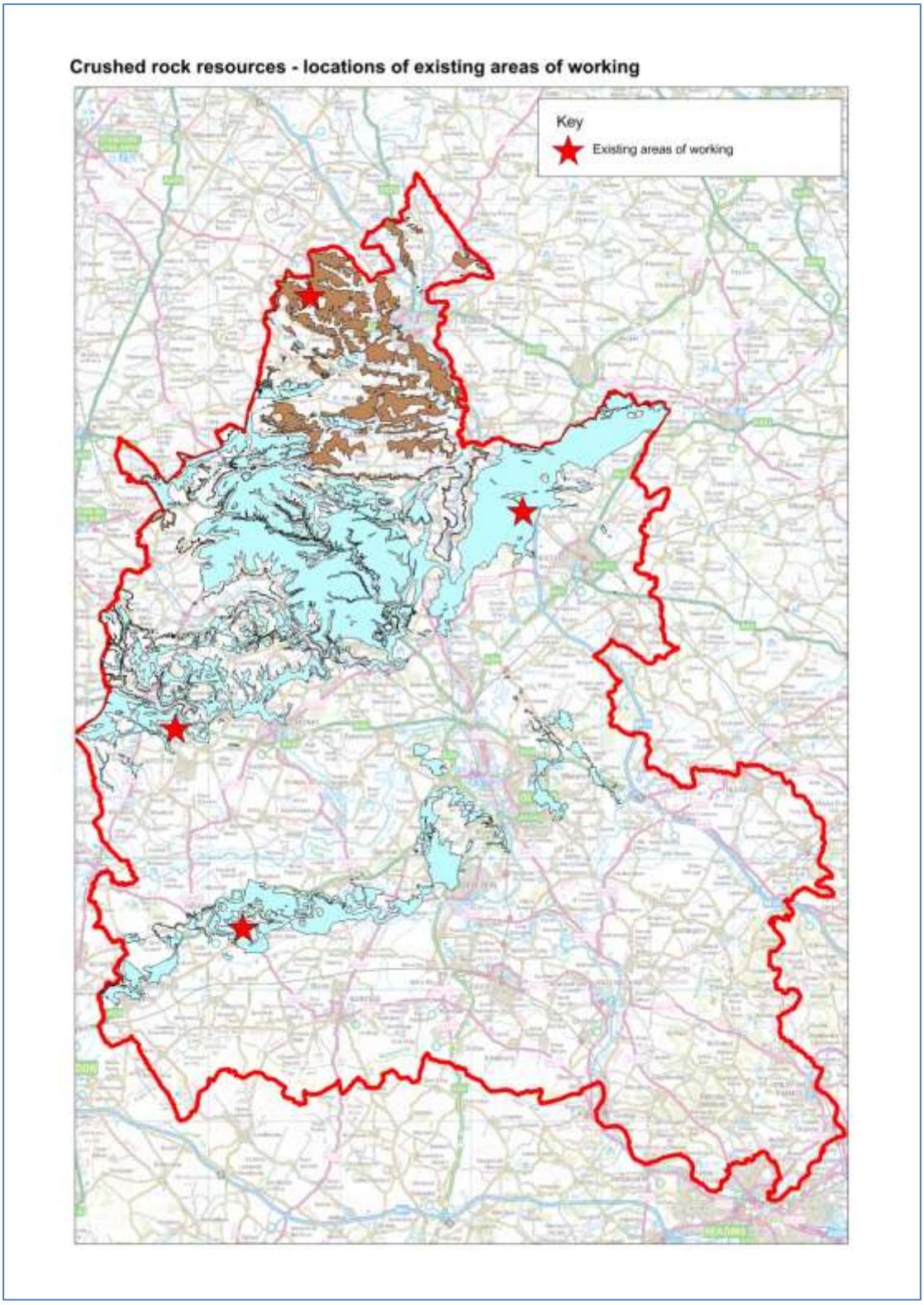
addressed more appropriately at the stage when Mineral Consultation Areas are identified. The note of the meeting with the operators is at Appendix 2. This suggestion has been noted and resources in existing working areas within the AONB have not been excluded from the safeguarding process at this stage.

3.14 Map 3.2 shows the preliminary conclusions for safeguarding limestone and ironstone for aggregate use.

Map 3.1 Ironstone and limestone resources in Oxfordshire



Map 3.2 Preliminary conclusions on safeguarding limestone and ironstone for aggregate use



Mineral Profile 4

4. LIMESTONE AND IRONSTONE: BUILDING STONE

Geology and Main Uses

4.1 Other types of stone have been worked in Oxfordshire in the past, but only the Chipping Norton limestone and the Ironstone of the Marlstone Rock Formation are now worked for building stone, although small quantities of building stone are extracted from time to time at White limestone aggregate quarries.

4.2 Chipping Norton limestone is a medium to coarse grained oolitic limestone forming an extensive plateau which is up to 10.7m thick near Chipping Norton. It has historically been quarried extensively for building stone around Chipping Norton and Charlbury. Many cottages in the Chipping Norton area are built of this stone. It is currently worked at Castle Barn quarry, Sarsden.

4.3 Ironstone occurs in the Marlstone Rock Formation in the north and north west of the county. It is worked for building stone at Great Tew quarry. To the west of Banbury it is worked mainly for aggregates, although some building stone is also produced.

Safeguarding building stone

4.4 Para 3.2 of Annex 3, Natural Building and Roofing Stone of MPS 1[9] states that:

'English Heritage and the industry are encouraged to make mineral planning authorities (MPAs) aware of important sources of building and roofing stone that they consider should be safeguarded from other forms of development through policies in their local development documents (LDDs). Safeguarding will be most appropriate where stone is believed to be of suitable quality, and is:

- *scarce in terms of its technical properties and/or aesthetic characteristics; or*
- *has been identified as having characteristics which match those required for repair and preservation purposes, including those related to individual, or groups of culturally important buildings.'*

Option 1: Safeguard all the known building stone resources

4.5 MPS 1 encouraged safeguarding of building stone but recognised that this may not always be appropriate if information on resources is poor. The NPPF (March 2012) does not provide any guidance on safeguarding building stone although it does say that local planning authorities should;

[9] Communities and Local Government: Minerals Policy Statement 1 (2006) Planning and Minerals

'*consider how to meet any demand for small scale extraction of building stone at, or close to relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites.*'

Option 2: No safeguarding because of the poor data on the resource

4.6 The Council has a lack of detailed geological information on workable building stone resources, and it is therefore difficult to identify areas with potential building stone resources with any certainty. Building stone quarries are small scale and the quality of stone and suitability for working as building stone is very variable. It would therefore be difficult to identify potentially workable building stone resources for safeguarding except on a detailed site specific basis.

Safeguarding limestone and ironstone for building stone uses – preliminary recommendations

4.7 The preliminary recommendation is not to safeguard building stone resources due to the lack of geological data available. Building stone resources mainly occur in the Cotswolds AONB or other countryside locations where the risk of sterilisation by other development is low. Small scale extraction of building stone is encouraged in the consultation draft Minerals Planning Strategy.

Mineral Profile 5

5. FULLER'S EARTH

Geology

5.1 Fuller's earth deposits were formed as a result of the alteration of volcanic ash deposited in seawater. The accumulation and preservation of volcanic ash into beds involved a complex set of geological processes. Consequently, fuller's earth deposits of potential economic interest have a very restricted distribution in Britain and Oxfordshire is one of the few counties in which the mineral occurs and has been worked. It is also found, and has been worked, in Surrey and Bedfordshire. Map 5.1 shows the location of fuller's earth in Oxfordshire.

5.2 Fuller's earth occurs in the Lower Greensand in Oxfordshire, but is confined to the Baulking-Fernham area to the south of Faringdon. It was extracted at Baulking until 2006 in a form known as calcium montmorillonite; after this time it was no longer able to compete economically with imports of fuller's earth from abroad. A further area with planning permission for extraction (Moor Mill Farm, Baulking) was left unworked.

Main uses

5.3 Fuller's earth is a term covering a wide variety of clays which are able to absorb grease, oil and water. It was originally used for cleansing or 'fulling' woollen cloth and is now used in paper making, foundry bonding and other industrial applications.

Long term prospects

5.4 The British Geological Survey published research in 1992 entitled 'An Appraisal of Fuller's Earth Resources in England and Wales'. It found that fuller's earth resources are limited and that the best prospects of finding potentially economic reserves of Fuller's Earth are in areas of existing or former working.

5.5 The BGS Mineral Planning Factsheet[10] on Fuller's Earth notes that:

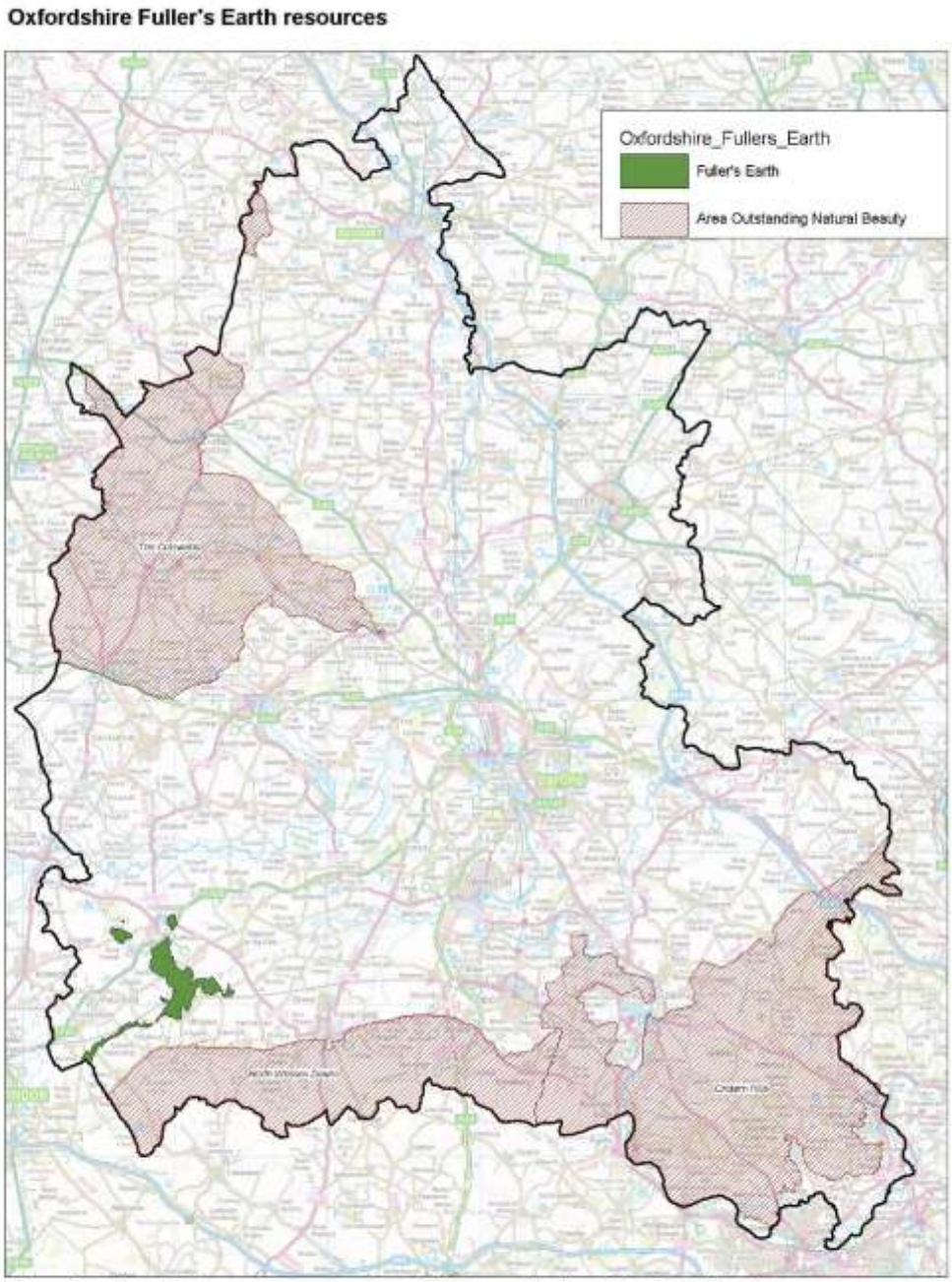
> '*reserves of fuller's earth with planning permission are confined to a small satellite deposit at Moor Mill Farm, about 2km from the plant at Baulking. The deposit…contains the equivalent of about 300,000 dry tonnes of product*.'

[10] British Geological Survey & Office of the Deputy Prime Minister (2006) Fuller's Earth; Mineral Planning Factsheet

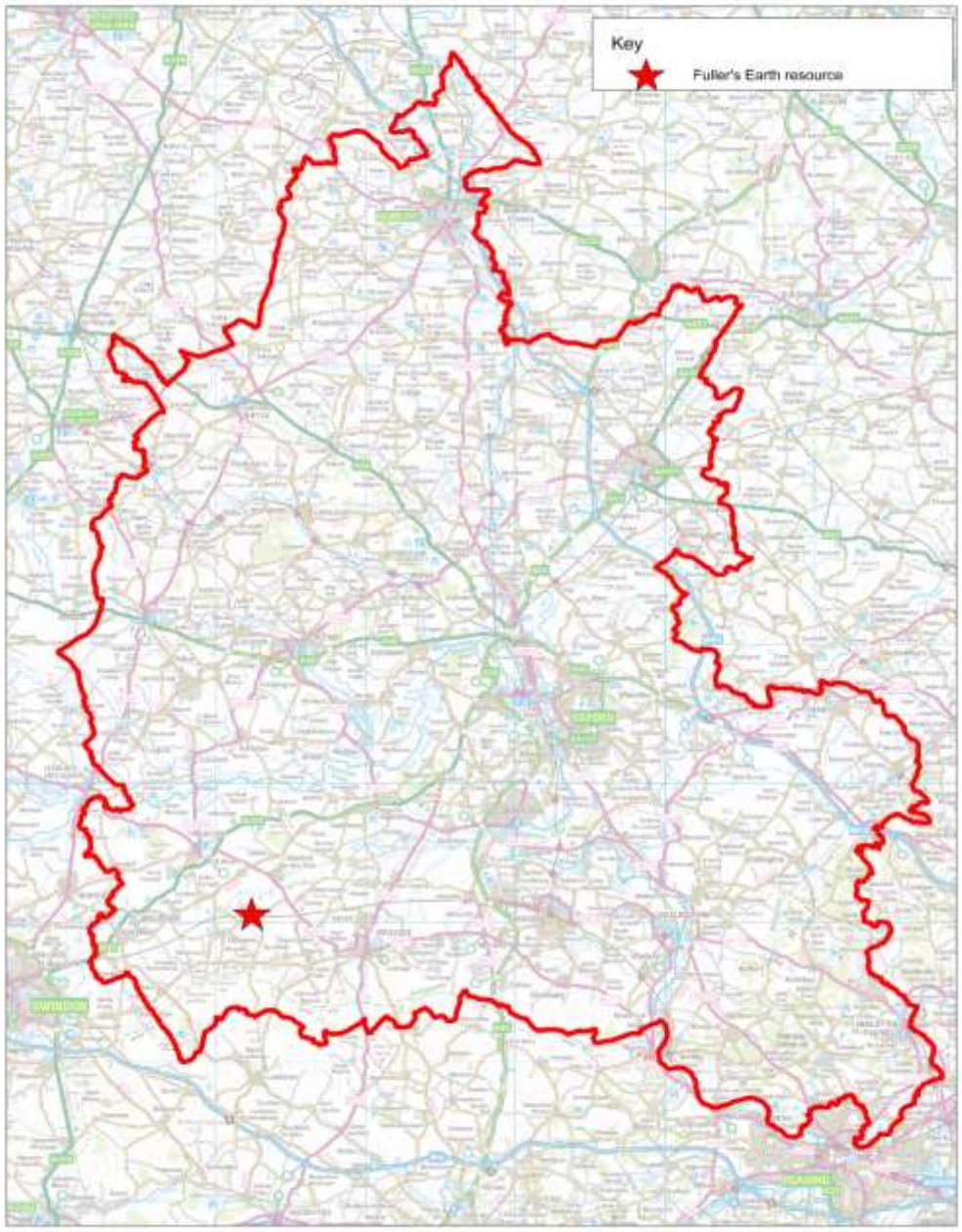
Safeguarding fuller's earth

5.6 This is a nationally scarce and potentially important mineral with a number of industrial uses. The preliminary conclusion is therefore that the proven resource between Moor Mill Farm, Fernham and Baulking should be safeguarded. Map 5.1 shows the fuller's earth resources in the county and map 5.2 shows the proposed safeguarding policy.

Map 5.1 Fuller's earth resource in Oxfordshire



Map 5.2 Preliminary conclusions on safeguarding fuller's earth



Mineral Profile 6

6. CHALK

Geology

6.1 Chalk is a relatively soft, fine-grained, white limestone, consisting mostly of the debris of planktonic algae. It outcrops in the south of the county in a broad band running from east to west. The chalk can be subdivided into two categories; low and high purity. The low purity chalk is found in the formation of the grey chalk subgroup, which has a relatively high clay content. This formation is about 60m thick in Oxfordshire. The high purity chalk, from the white chalk subgroup is about 150m thick in Oxfordshire. Map 6.1 shows the location of chalk in the county.

Main uses

6.2 Chalk is used in the production of cement and agricultural lime, and can be used as aggregate, and it has in the past been used as a building stone. In the past the cement works at Chinnor was a major user of chalk, but that works is now closed. Chalk is an important aquifer and is a major source of groundwater in the south of the county.

Long term prospects

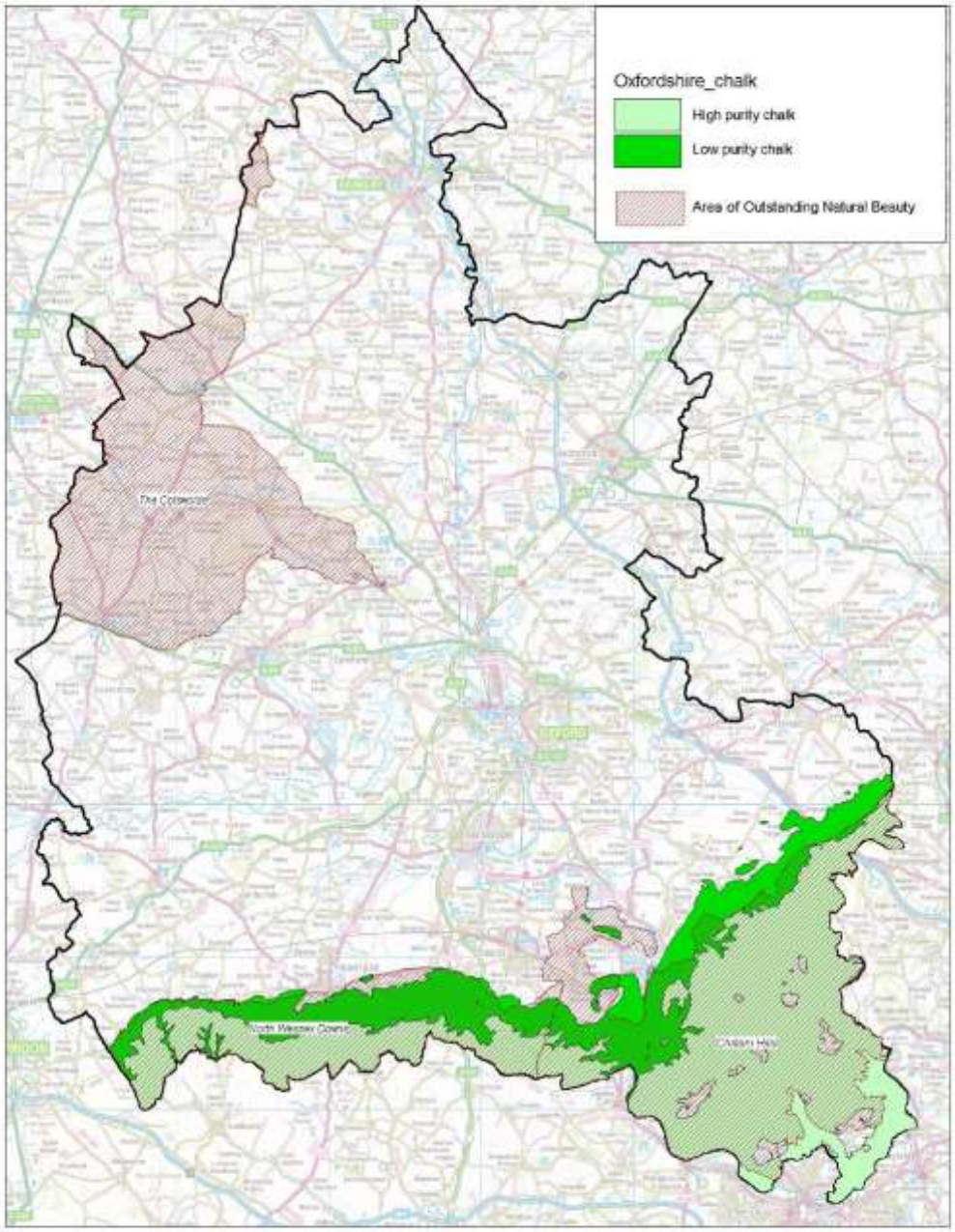
6.3 The chalk quarry at Chinnor closed in the late 1990s and chalk is no longer worked in Oxfordshire, although there are permitted reserves remaining at Ambrose Quarry near Ewelme. There has been no further interest in working chalk from operators or landowners. Apart from where it is required to supply cement works (not in Oxfordshire), chalk is not a nationally important resource, and it is not a scarce mineral. The majority of the chalk resource in Oxfordshire lies within the Chilterns and North Wessex Downs Areas of Outstanding Natural Beauty.

Safeguarding chalk

6.4 The preliminary conclusion is that chalk is not an economically important mineral in Oxfordshire and given its widespread occurrence it does not need to be safeguarded. It was suggested at a meeting with mineral operators in March 2011 that, should new chalk workings open in Oxfordshire, safeguarding of resources could be considered if a certain threshold or level of working is reached. The note of the meeting with the operators is at Appendix 2.

Map 6.1 Chalk resources in Oxfordshire

Oxfordshire chalk resources



Mineral Profile 7

7. CLAY

Geology

7.1 There are three clay formations in Oxfordshire; Gault, Kimmeridge and Oxford formations. Map 7.1 shows the Gault clay resource in Oxfordshire. The Kimmeridge and Oxford Clay outcrops lie to the north of the Gault Clay, across the county.

7.2 Gault clay is a grey, sometimes silty clay which forms the southern half of the Vale of White Horse in the south west of the county.

7.3 Kimmeridge clay is a series of dark clays which form the northern half of the Vale of White Horse. The only semi-permanent exposures of Kimmeridge clay in Oxfordshire are on the floors of the gravel pits around Abingdon.

7.4 The Oxford clay formation covers a broad tract of land through Witney, Bicester and towards Buckingham, and under Oxford itself. It forms the upper Thames valley above Oxford, the Cherwell valley from Kidlington to Oxford and the valley of the River Ray and Otmoor. The only limited exposures of Oxford clay are found under the sand and gravel pits at Cassington and in the Lower Windrush Valley near Witney.

Main uses

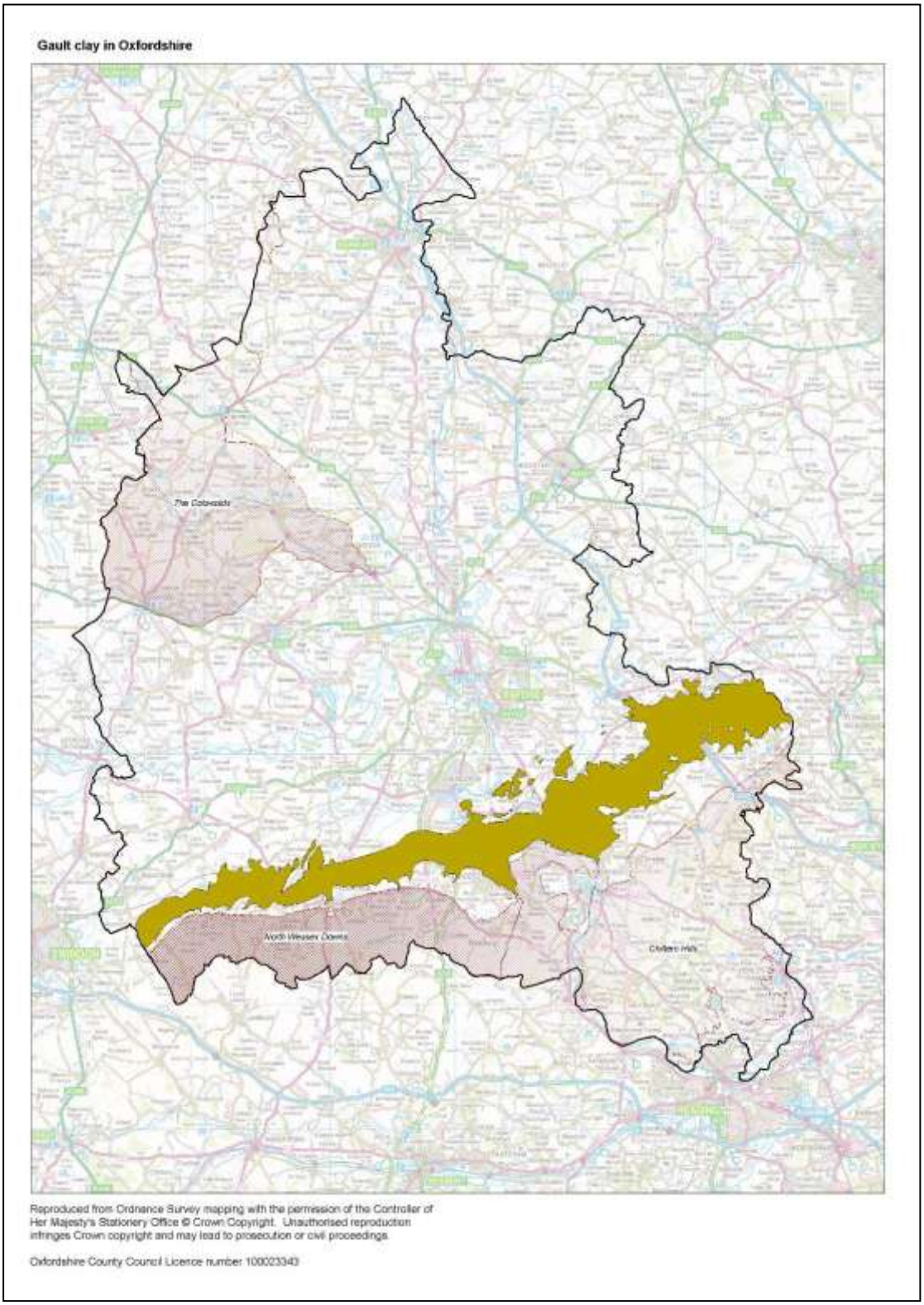
7.5 Gault clay has provided the material for many brick buildings in Uffington, Childrey and Thame. Kimmeridge clay was worked at Chawley brickworks, near Cumnor. Oxford clay was worked at brickpits in north Oxford until the early 20th century when they closed due to adverse economic conditions. No brickworks exist in the county now. Clay is now only worked in Oxfordshire to supply material used in engineering of landfill sites.

Safeguarding clay

7.6 Annex 2 of MPS 1 states in para 2.1 that an objective for brick clay is *'to safeguard and where necessary, stockpile supplies of clays'*.

7.7 Clay is an extensively occurring mineral which is found in many counties. Brickmaking is no longer economically viable in Oxfordshire and the only current requirement for clay is for landfill engineering material. This can be met from working of clay in conjunction with sand and gravel extraction. The preliminary conclusion is that clay resources do not need to be separately safeguarded.

Map 7.1 Gault Clay in Oxfordshire



Mineral Profile 8

8. COAL AND COAL BED METHANE

Geology

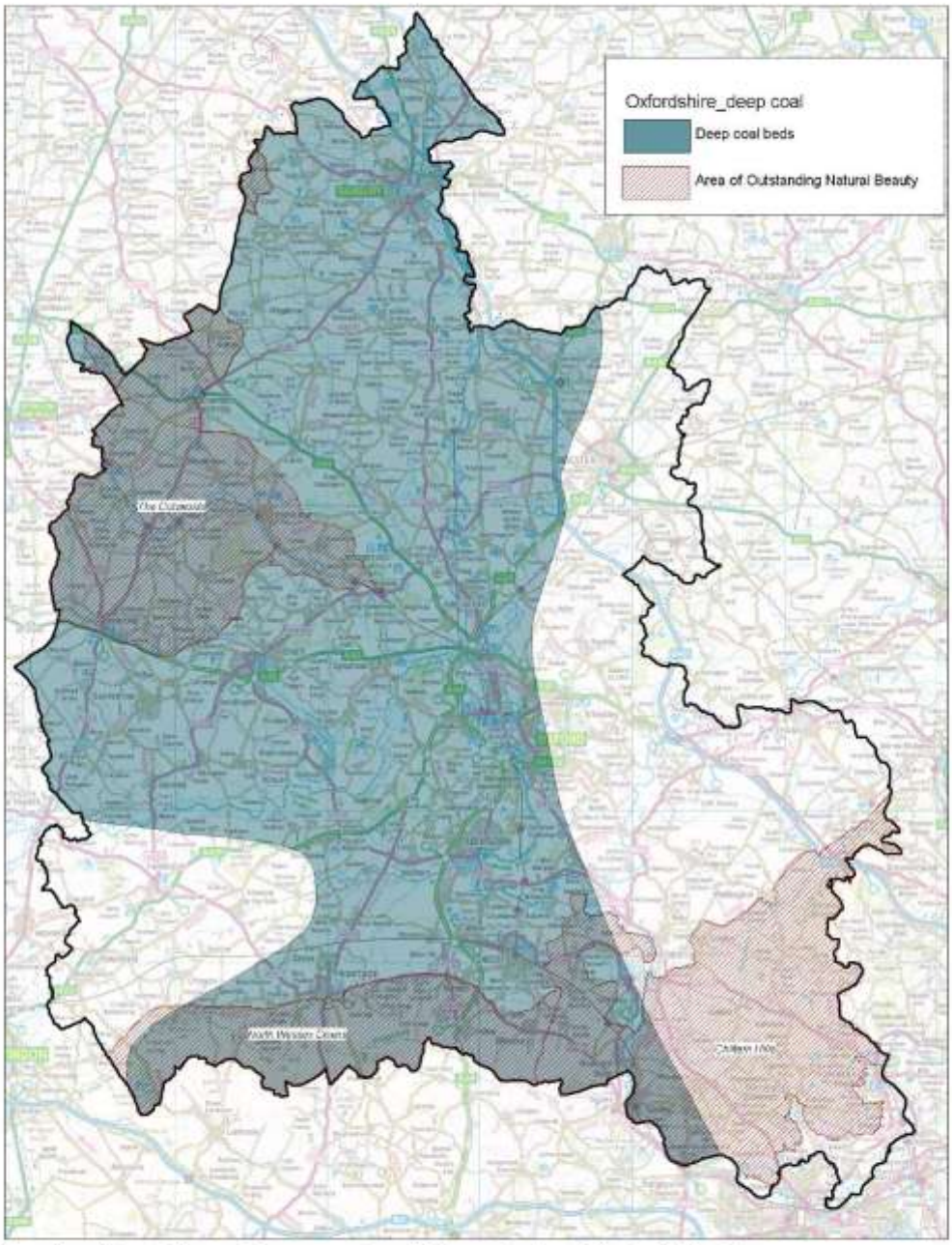
8.1 The Oxfordshire-Berkshire coalfield lies at depths of between 300m and 1500m across much of the northern and western Oxfordshire. Thin, bituminous coals have an average total thickness of 10 metres and average gas seam content of 0.4m³t. No coal has been mined and the coal seams are of no current economic interest. The Coal Measures succession is considered to be unprospective for coal bed methane because of its low gas content and the County Council is not aware of any proposals to develop coal bed methane over the next 20 years. Map 8.1 shows the location of deep coal beds in Oxfordshire.

Safeguarding

8.2 The preliminary conclusion is that there is no need to safeguard surface areas above coal seams or where coal bed methane could be processed, as the coal is no economic interest and there is too much uncertainty to enable coal bed methane safeguarding areas to be identified.

Map 8.1 Coal bed methane

Oxfordshire deep coal resources



APPENDIX 2

Note of meeting between OCC and mineral operators on 1st March 2011 to discuss draft topic paper on mineral safeguarding

Present: Alan Mackenzie (Hills Quarry Products)
Martin Layer (Smiths Bletchington)
Douglas Symes (DKS Planning)
Steve Bowley (Stephen Bowley Planning)
Paul Williams (Hanson)
Kirsten Hannaford Hill (Cemex)
Bill Horsfield (Oxfordshire Geology Trust)
Peter Day (Oxfordshire County Council)
Lois Partridge (Oxfordshire County Council)

Apologies: Richard Small (Cemex)

1. Update on Minerals and Waste Development Framework preparation

Peter Day updated the meeting on the preparation of the Minerals and Waste Core Strategy. He told the meeting that Cabinet had agreed a preferred strategy for mineral extraction on 16th February but that Cabinet's decision had now been called in by the Growth and Infrastructure Scrutiny Committee. The Scrutiny Committee will review Cabinet's decision at a specially convened meeting which will be held on 9th March 2011. It is not yet clear what the course of action will be after this meeting.

The Atkins report on a local assessment of aggregates supply requirements has been published on the OCC website and comments are invited on the report by 31st March. It was thought that the Minerals Products Association is likely to respond although individual mineral operators may also submit comments separately.

2. Principles of safeguarding

A revised draft topic paper on Safeguarding Minerals in Oxfordshire had been circulated in advance of the meeting. The meeting discussed principles of safeguarding, before moving on to discuss each mineral in Oxfordshire.

2.1 Time frame

The meeting discussed the appropriate time frame over which minerals should be safeguarded. It was generally agreed that a core policy in the Core Strategy should safeguard minerals for the foreseeable future, not limiting this to the duration of the plan period; safeguarding should extend beyond the plan period but must be realistic in order to be

deliverable. Development management policies should then set out the criteria which should be taken into account if a planning application is made for alternative types of development on safeguarded land, to enable an evaluation to be made of the importance of keeping the mineral available for potential future extraction against the proposed development. An assessment of the likelihood of the mineral being worked within the plan period could be one of the criteria used. There should also be policy on prior extraction.

2.2 Identifying which minerals should be safeguarded

The view was expressed that all minerals should be safeguarded for possible future use because, although some areas may not currently be economically viable, advances in technology and changes in policy may lead these minerals to become workable in the future. However, safeguarding all minerals would give them all the same protection and policy in MPS 1 is to safeguard proven resources.

On chalk, it was noted that there is a lack of robust geological evidence. Only the chalk on the northern edge of the Chilterns and around Reading is likely to be of possible future interest for cement, but these deposits are in the AONB.

It was noted that some other counties have commissioned BGS to advise on mineral safeguarding areas and policies. Peter Day said that the proposed safeguarding areas in Oxfordshire have been identified using the BGS surface geology mapping; for sand and gravel the Mineral Assessment Reports have been used, which have provided a good level of detail on which to base the work done to date. However, the mapping of soft sand and limestone has only been based on the BGS surface geology maps; this may need to be reviewed to take into account some concealed deposits which could be potentially workable.

Concern was expressed over the mapping of the Corallian sand deposits; these are very variable and the detailed geology is unknown except where exploratory work has been done.

It was agreed that fullers earth should be safeguarded because of its scarcity, even though there is currently no market for it and working has ceased. It was agreed that coal-bed methane does not need to be safeguarded.

The meeting discussed the proposition that safeguarding should be limited to those minerals which either are considered to be a proven resource because they are currently being worked or the industry has expressed an interest in working them during the plan period or are scarce, potentially important minerals. Under this approach, sand and gravel, soft sand, limestone, ironstone and fullers earth would be safeguarded, but chalk and clay would not. Such a safeguarding policy

should be reviewed in the future, either as part of a general review of the plan or as a specific review if there is a change in circumstances.

2.3 Boundaries of MSAs

The exclusion of AONBs from MSAs was questioned. It was suggested there is a parallel with BMV agricultural land, and that the whole of the mineral deposit should be identified as a starting point for safeguarding resources. All proven resources should be included but criteria should be set out in policy against which proposals for potentially sterilising development would be considered. But it was noted that practice in other MPAs varied on this: e.g. Berkshire included the whole of the mineral resource in MSAs but Warwickshire took a more selective approach.

Operators asked whether there should be buffer zones around MSAs to ensure that other types of development near the boundaries of MSAs do not constrain potential mineral working in MSAs. Peter Day suggested it would be more appropriate for this to be done through the MCA boundaries. It was generally agreed that MCAs should include a buffer zone, with boundaries based on MSAs but with more detail and taking into account other land uses.

Within MCAs, the onus will be on a developer to provide the geological information necessary to the MPA to enable it to decide whether a proposed development would sterilise a potentially workable mineral resource. It was suggested that guidance should be made available to developers on the evidence that they would need to provide with applications for development within MCAs.

3. Minerals

Lois Partridge described the approach taken to drafting the MSA for each mineral type in the county. For each mineral, options were put forward in the paper and a preferred option was suggested.

3.1 Sharp sand and gravel

The proposed MSA for sharp sand and gravel covers all the resource in the River Thames, Lower Windrush, Lower Evenlode and Lower Thame valleys. It proposes not to include the deposits in the Upper Thame, Cherwell and Ock valleys which are of variable thickness and quality and are not considered to be proven.

It was generally agreed that this approach was pragmatic and could be reviewed should the deposits in the upper and tributary river valleys become potentially significant for the supply sand and gravel in the future.

Operators questioned whether the proposed MSA for sharp sand and gravel excluded areas which were proposed or nominated in the past

as proven resources. PHD acknowledged that it is possible that areas proposed or nominated in the past, including for the previous Minerals and Waste Local Plan or earlier Structure Plan work, may not be included in the MSA. The geological exploration work done for the County Council some years ago on sand and gravel deposits in the Cherwell valley north of Kidlington, and on areas of Corallian soft sand deposits was referred to.

The meeting discussed glaciofluvial deposits and it was suggested that the area around Ewelme should be included in the MSA in order that the methodology is consistent with the inclusion of the glaciofluvial deposits around Finmere. These deposits form a discrete type of gravel containing a high proportion of hard flint stones, which is only otherwise available at Caversham in the county, and therefore constitutes a potentially important resource. There is a history of working these deposits at Ewelme, but it was noted that most of the good deposits in that area have already been worked.

3.2 Soft sand

The proposed MSA for soft sand includes the surface deposits of Corallian soft sand in the south west of the county and in the area around Duns Tew in the north of the county. It was noted that the MSA does not include concealed deposits at Boars Hill (below the Kimmeridge Clay) or at Duns Tew (below the Taynton Limestone) and suggested that these should be included.

Others agreed with this, but it was noted that defining the area of the MSA would be difficult in the absence of detailed geological information. There is also the question of where to stop; when does the overlying depth of strata become too thick to justify safeguarding? It was suggested that TVERC may be able to advise on this.

3.3 Limestone and ironstone

The proposed MSA for limestone excludes the Cotswolds AONB; it covers the areas where there is existing working; near Burford, in the south west of the county and in the north east. Given the extensive nature of the limestone resource, the meeting thought that it might be more useful to identify the particular beds of limestone which have historically been worked for aggregates, such as the White Limestone and the Highworth limestone, rather than the whole limestone sequence, much of which is more variable in quality and less suitable for aggregate production. These areas would be similar to those identified in the preferred strategy for crushed rock, and would lie outside the AONB. Within the AONB there are beds of limestone that are suitable for building and walling stone.

It was suggested that TVERC may be able to help and advise on identifying deposits of limestone potentially suitable for aggregate,

including concealed deposits such as to the south of the A40 near Burford.

The safeguarding paper should reflect that concealed deposits of soft sand and crushed rock are being included in the respective MSAs, but not for other minerals.

It was suggested that excluding the limestone resource which is in the AONB would be an unwarranted limitation on the MSA, and that this factor should instead be taken into account when considering an application for potentially sterilising development.

The proposed MSA for ironstone for aggregate use was agreed; it covers the areas which are the subject of Reviews of Mineral Permissions.

The meeting discussed safeguarding limestone and ironstone resources for building stone use. Following advice to officers, the MSA proposes to safeguard four small areas around Sarsden, Great Tew, Ditchley and Chipping Norton airfield. It was pointed out that it is difficult to identify workable building stone resources without detailed geological information, and it is difficult to be site specific. Building stone quarries are small scale, with low output, and the quality of stone and suitability for working as building stone is very variable.

It was thought that safeguarding large areas of limestone for building stone was not practical, but neither should safeguarding just be limited to those four areas. An alternative approach could be to identify MSAs around existing and past building stone quarries. Historically the Taynton Stone is the most important building stone in Oxfordshire, and there are resources remaining at the quarries to the west of Burford. But there are many historic quarries, so this may not be a practical approach. It may not be realistic to identify MSAs for building stone resources at all.

3.4 Fuller's Earth

The meeting agreed that the proposed MSA for Fuller's Earth in the Baulking-Fernham-Moor Mill area, based on information in the BGS geological reports on this deposit, was appropriate because although Fuller's Earth is not currently worked in the UK, it is a nationally scarce mineral which may be required again in the future.

3.5 Chalk

No MSA is proposed for chalk as this mineral is no longer quarried in the county and there are no plans in the foreseeable future to work chalk or to develop cement works. Some operators thought that the chalk deposit should be safeguarded as the demand for it could change in the future if there are national changes in policy. The

meeting agreed that if chalk is not safeguarded in this plan period, there should be opportunities to review this policy in the future.

It was suggested that OCC could set a tonnage threshold to provide a criterion by which to determine whether or not a mineral should be safeguarded. If working of a mineral exceeds the threshold in a year, the safeguarding policy should be reviewed and the mineral should then be safeguarded.

3.6 Clay

Similarly no MSA is proposed for clay, which covers an extensive area across central and southern Oxfordshire. Clay has not been used for making bricks in Oxfordshire since the early 20th century. It has limited uses in engineering and landfill capping but the clay used for this is extracted from sand and gravel quarries. The meeting discussed whether clay would need to be extracted to construct the proposed reservoir near Abingdon; it was noted that aggregates are proposed to be imported by rail for that project and there are no plans to extract clay for it from outside the construction site.

3.7 Coal bed methane

No MSA is proposed for coal bed methane; should this gas become economically viable, only small areas would be required to drill down and these could be located almost anywhere on the western side of the county.