

Nottinghamshire Minerals Local Plan

Background Paper

Archaeology

Consultation January - March 2012



Purpose of background paper

This background paper summarises the issues surrounding the relationship between mineral extraction and archaeology.

Other background papers supporting the Minerals Local Plan

- Aggregates estimating future aggregate requirements to 2030
- Aggregates sand and gravel, options for meeting shortfalls
- Aggregates Sherwood Sandstone, options for meeting shortfalls
- Aggregates Limestone (crushed rock), options for future provision
- Alternative aggregates
- Biodiversity
- Brick clay
- Building stone
- Coal
- Development management policies
- Gypsum
- Hydrocarbons oil and gas
- Industrial dolomite
- Landscape character
- Minerals safeguarding
- Silica sand

The Government launched its consultation on the draft National Planning Policy Framework on the 25th of July 2011. This proposes to replace nearly all existing Planning Policy Statements (PPS) and Minerals Policy Statements (MPS) into a single streamlined and much shorter document. The final NPPF is not expected to be issued until mid 2012 and its contents could change from the draft in response to consultation.

This background paper therefore bases its assumptions on the current national policy guidance but the potential implications of the proposed new guidance are considered where this differs from the current position.

The intention is to revise the background papers as necessary when the new guidance is issued and to assess the implications before the County Council reaches a decision on the preferred approach of the new Minerals Local Plan.

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1. Introduction

- 1.1 Nottinghamshire is not only rich in minerals, but also in archaeological sites of all periods. Minerals extraction can destroy archaeological sites and features, but where appropriate mitigation measures are put into place it also provides opportunities for landscape scale study of the past.
- 1.2 Work on aggregates extraction and the County's archaeological resource has recently been undertaken by archaeologists from the County working in partnership with Trent and Peak Archaeology, on a project funded by English Heritage. "Aggregates and Archaeology In Nottinghamshire" (AAN) will be published shortly (Knight et al, 2012) and although the project concentrated specifically on aggregates such as sand, gravel and crushed limestone, the results of the work have a wider applicability across other types of minerals and their extraction.
- 1.3 In addition to looking at what is currently known about the archaeology of each of the relevant geologies, the project also considered the types of mitigation proposals which might be applicable in each case. The recommendations of the project, in conjunction with the practice guide "Mineral Extraction and Archaeology" (EH, 2009), will provide a basis for the investigation of new extraction sites in the County over the lifetime of this framework/plan, amended as required by experience or new knowledge. A few issues have become apparent from the project which are worth mentioning as general background.
- 1.4 Firstly, there is a consistent issue about identifying the locations of prehistoric settlement or funerary activity, whatever the geology. The same is true for remains of Saxon/Early Medieval date. This may be because sites of these periods tend to be isolated occurrences, scattered and discrete areas of activity, some of which may have originally been sited in relation to landscape features that no longer exist. Our ability to predict where prehistoric and Saxon sites may be found needs significant improvement; to achieve this will require new directions in methods of archaeological evaluation and mitigation.
- 1.5 Secondly, the project has demonstrated the significant impact that the history of archaeological endeavour can have in an area. To pick one geological zone, the Magnesian limestone in Derbyshire has a rich archaeological resource of a wide range of periods. The same geology over the County boundary in Nottinghamshire has very little. This can only be a reflection of an historic lack of archaeological fieldwork in this zone.

2. Assessing the significance of Heritage Assets

- 2. 1 The first point of call in understanding the archaeological resource of a potential extraction site will be Nottinghamshire's Historic Environment Record (HER). This is a database of known archaeological sites and monuments in the county. It is held by the county council, and comprises a mix of databases, maps, reports on past archaeological work and other sources. There are, as at November 2011, over 18,000 records on the main database. Over the lifetime of this strategy, as resources allow, it is our intention to deliver online access to at least a subset of the main HER database.
- 2. 2 Archaeological work funded by developers through the planning system provides a constant stream of new information for the HER, and the HER is continuously updated. Even so, it is unlikely that this information will on its own be of sufficient detail to enable the significance of individual heritage assets of a prospective mineral site to be properly assessed. In addition, not all heritage assets within a proposed development site will have been previously recorded; very many archaeological sites and features in the county await discovery. There will, therefore, usually be a need for more investigation before full and proper assessments can be developed for individual heritage assets within a proposed development area. This will generally include a range of techniques, including desk based assessment, fieldwalking, geophysical investigation and trial trenching.
- 2. 3 This work is intended to ensure an understanding of the relative significance of heritage assets which may be affected by extraction, without which it will not be possible to ensure a proportionate response to their potential loss. The most important archaeological sites need to be protected and preserved. Some of these may be designated, e.g. as scheduled monuments, but it must be recognised that not all nationally important archaeological remains will be designated indeed, the current legislation does not allow for some types of archaeological site to be designated, despite their clear national and even international significance¹. Undesignated sites of national importance will nonetheless be preserved in situ in all but the most exceptional circumstances.
- 2. 4 The loss of sites of lesser significance will need to be mitigated, through for instance, archaeological investigation, excavation and recording, and the dissemination of the results of such work. The nature of the mitigation work should be proportionate to the significance of the heritage asset which will be lost. So, where the loss of sites is deemed acceptable, there will not be one standard approach to mitigation; the more important the site the greater the need to ensure an appropriately high level of mitigation. Minerals extraction sites often cover large areas, and it is to be expected that a mitigation programme

¹ One such site in the County is the open air Palaeolithic site at Farndon, near Newark.

will involve a range of approaches. These will include preservation in situ of the most important sites, full archaeological excavation of areas of intensive past activity, "strip, map and sample" exercises for areas where the archaeological resource is thinly spread (e.g. small discrete archaeological features, such as prehistoric pits and postholes) or a mixture of all such approaches, supported as appropriate by a panoply of scientific techniques to maximise information capture. Assessments of significance and the design of mitigation proposals will always require professional input from appropriately qualified and experienced specialists.

2.5 It should also be noted that Government and heritage bodies such as English Heritage increasingly recognise that some heritage sites or features may be perceived to be of enhanced significance because of the meaning they have for local communities. However, practice has not yet clarified the weight which should be attached to the preservation of features which are of special significance to communities in cases where this cannot be supported by the professional opinions of the heritage sector.

3. Historic landscapes

- 3. 1 Nottinghamshire has a diverse rural landscape. Taking the extremes, Bassetlaw in the North tends to be dominated by modern large arable fields and scant hedgerows, while Rushcliffe in the South has a more mixed landscape, with pastures of well preserved ridge and furrow close to village cores, and a mix of pasture, arable and woodland between settlements.
- 3. 2 The districts between also have their own distinctive characteristics. The patterns of woodland, field shapes and boundaries, areas of pasture and arable play a subtle but defining role in shaping different parts of the county. For the large arable fields of Bassetlaw there may be little time depth visible. Elsewhere, however, veteran trees, tree and hedgerow species and diversity, hedge banks and other earthworks, such as ridge and furrow, plus field shapes and sizes, not only provide the landscape's definition, but can in many cases be read as a history of landscape change and development lasting over centuries.
- 3. 3 Greater use will need to be made of the now established technique of historic landscape characterisation (HLC), applying its general principles to individual prospective extraction sites, and ensuring that the fine detail of their landscape is properly understood and recorded. Most counties in England have now completed high level historic landscape characterisation². Nottinghamshire was one of the first to undertake HLC, and the project undoubtedly contributed to the development of a unified national process. This means, however, that

² For an overview of HLC in the national context see http://www.helm.org.uk/server/show/nav.19604

some of the information it has provided is, at best, not fully aligned with that of neighbouring counties, and at worst is flawed for some categories of field type. It is the intention of the county to seek measures to reassess and update the HLC data during the lifetime of this strategy. However, resources for this are currently unavailable and are likely to remain so for the foreseeable future.

3. 4 Nevertheless, during the lifetime of this strategy, it is likely that some areas of historic landscape will warrant preservation in situ; such is the demonstrable time depth and legibility of the landscape features they contain that minerals extraction will be deemed inappropriate in that location.

4. Restoration

- 4. 1 Previous overviews of the impact of minerals extraction on archaeological sites in the county have understandably concentrated on the potential for damage to buried archaeological remains, and the need for suitable mitigation for their loss. The plans for site restoration, however, have rarely been subject to overview from the point of view of the historic landscape, and some restoration sites, particularly the older ones, may feel alien to locals and visitors alike. The most obvious examples in Nottinghamshire are probably the spoil heaps of the coalfield, where restored landforms exaggerate the contours of the surrounding natural geology, while the coniferous plantations with which they were planted have altered the public perception of historic Sherwood Forest for generations.
- 4. 2 Landscape restoration has a range of environmental targets to deliver; including biodiversity, amenity and agriculture. Restoration which takes into account the historic landscape that existed within the site, and which may still exist in the surrounding area, has the potential to not only to contribute to these targets, but also to develop restored sites which fit better with the surrounding landscape. This strategy will seek to ensure consideration of the historic landscape is taken into account when considering restoration proposals.

5. Mineral specific issues and options

Sand and gravel

5.1 From the mid-1980s much archaeological work concentrated on the sand and gravel extraction sites of the Trent, Idle and other river valleys, where buried archaeological remains in arable fields appear as cropmarks visible through aerial photography, and revealing rich archaeological landscapes; in some places, these landscapes overlie one another, revealing centuries if not millennia of past human activity. One such concentration of cropmark features, near South Muskham

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Policy M6.1 Archaeological Resource Area – South Muskham

Planning permission will not be granted for sand and gravel extraction within the major archaeological resource area near South Muskham.

The extent of the area to be protected is illustrated in Plan 1. The new Minerals Local Plan will need to assess the merits of continuing to protect this major archaeological resource area from sand and gravel extraction

- 5.2 The work in the Trent and Idle Valleys has spread particular light upon the Roman agricultural landscape, and how it developed from Iron Age origins. A picture is emerging of a relatively densely occupied rural landscape, with a developing settlement hierarchy and considerable landscape change over time. Evidence from these gravel sites is also increasing our understanding of Saxon settlement and its transition from a dispersed pattern of scattered farms and hamlets to the nucleated villages, clustered around Church or manor, which still dominate the settlement patterns of these areas today.
- 5.3 The evaluation techniques and mitigation methodologies which have developed in reaction to sand and gravel extraction have been preeminently successful in locating and characterising Roman and Iron Age rural landscapes and settlements. The extensive field systems which are associated with Roman agriculture are frequently visible as cropmarks, and provide a framework allowing investigators to home in on the farms and settlements with which they are associated. For sites of the Prehistoric and Saxon periods, whether settlement or funerary, most are still primarily identified as a by-product of the investigation of Roman settlement sites; work needs to be done to improve their independent location.
- 5.4 At East Leake, where the soils overlying the glacial sands and gravels are less conducive to cropmark formation than in the Trent and Idle river valleys, gravel extraction has been preceded by the stripping of topsoils and overburden under close archaeological supervision. This has recovered a range of features from the prehistoric through to the Post-Medieval, and while many are severely plough damaged, the depth of information about developing land uses over centuries gives a clear idea of what we should be finding elsewhere.
- 5.5 On the few sites where metal detectors are fixed on conveyor belts, much new information has come to light on the ritual deposition of prehistoric metalwork in riverine locations. The importance of these finds cannot be overestimated; they may lack an archaeological context, but these weapons and other items offer their own wealth of information, and it is rare for comparable pieces to come from secure



- 5.6 archaeological contexts. The use of such metal detectors needs to be expanded as the most cost effective way of retrieving this important set of data.
- 5.7 Recent work on the dualling of the A46 has added a new dimension to the archaeology of the alluvial floodplain. Two scatters of Late Upper Palaeolithic flint tools and waste were found in situ in an area known from intensive fieldwalking to be one of the largest concentrations of LUP material in the country. This has provided a firm reminder to all who needed it of the complexity of floodplain archaeology.

Inset 1

Archaeological and Historical Timeline

The dates given below are as used in the Nottinghamshire Historic Environment Record.

Prehistoric

Palaeolithic	500,000 BC	-	10,000 BC
Mesolithic	10,000 BC	-	4,000 BC
Neolithic	4,000 BC	-	2,400 BC
Bronze Age	2,400 BC	-	700 BC
Iron Age	700 BC	-	43 AD

Historic

Roman	43 AD	-	410 AD
Early Medieval/Saxon	410 AD	-	1,066 AD
Medieval	1,066 AD	-	1,546 AD
Post Medieval	1,546 AD	-	1,780 AD
Modern	1,780 AD	-	Present

Magnesian limestone

5.8 It has already been noted that the Magnesian limestone in Nottinghamshire has a completely different archaeological signature from that just over the County boundary in Derbyshire. From the Derbyshire evidence, there should be remains of all periods from the Palaeolithic on. Beyond Creswell, however, there is surprisingly little known. Limestone valleys such as at Pleasley or Debdale are likely to have the potential to contain rock features which may have attracted settlement or other activity from the Palaeolithic into the Post-Medieval periods; while there is significant potential for fissures within the limestone to contain important faunal and environmental data if not remains directly associated with human activity.

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5.9 By comparison with Derbyshire, topographically suitable sites should have traces of prehistoric funerary traditions. The scatter of isolated Roman sites, such as the villa to the north of Mansfield Woodhouse, or the putative tile kiln at Sookholme, may indicate a level of exploitation of the area's natural resources in the Roman period which is currently completely misunderstood. Later exploitation of the Magnesian limestone resources may have masked the earlier traces of activity, but are unlikely to have completely destroyed them. New proposals for extraction will therefore provide opportunities to redress this imbalance.

Clay

- 5.10 The Mercia Mudstones are generally poor for the formation of cropmarks; so this geology is under-represented on the Historic Environment Record (now described above). However, the soils here are fertile, if heavy, and water supplies are readily available. There is therefore no reason why this zone should not have been occupied throughout prehistory, the Roman and the Medieval periods; even if one might not expect the intensity of occupation seen, for instance, in the Trent Valley in the Roman period. Moreover, the survival of areas of woodland and pasture increases the likelihood that there may be better preservation of earthwork features in this geological zone than in the heavily ploughed arable landscapes of the alluvial floodplains of the Trent or Idle.
- 5.11 Evaluative techniques for new applications for extraction will need to look at using a range of survey techniques including remote sensing methods such as Lidar³ while it may be appropriate here to consider mitigation techniques that favour controlled topsoil strips particularly in areas that topographically might be expected to be a focus of settlement or other activity.

Gypsum

- 5.12 The gypsum resources to the south of Newark, particularly the Bantycock site, have provided some of the most significant new archaeological information in the County of the last decade. This zone has been significantly under-represented in the HER. The mixed soils over the mineral tend to respond poorly or inconsistently to investigative techniques such as aerial photography or geophysics, and such historic records that do exist generally relate to scant casual stray finds.
- 5.13 After many decades of opencast extraction with little or no archaeological investigation, Bantycock is providing an opportunity to explore the usefulness of a range of investigative techniques, and the results have begun to re-write the archaeological resource of this

³ For details of this technique, the initials of which stand for "Light detection and Ranging" see http://www.english-heritage.org.uk/professional/research/landscapes-and-areas/aerial-survey/archaeology/lidar/

geological zone. Careful topsoil and overburden stripping under archaeological supervision has allowed the identification and recording of a range of features from long boundaries of prehistoric date, through to the ploughed out remains of Iron Age enclosures and roundhouses, wells, and burnt mound type features, as well as a number of extensive Roman settlements, some of which in layout are very similar to those from further to the north in the Trent Valley.

Sherwood Sandstone

- 5.14 The Sherwood Sandstones are significant in archaeological terms for the extensive Roman landscape known as the "Brickwork Plan field system", visible as cropmarks from aerial photography. This extensive and coherent system of land division has long rectangular strip fields running at right angles to the river valleys that dissect the sandstones; its name comes from the patterning of the long fields' subdivision. Set amongst these fields, are the cropmarks of trackways, and on the higher ground, settlement enclosures. Fieldwalking suggests this is an expansion of Roman agriculture into the drier and less fertile soils of the sandstones. The cropmarks extend from South Yorkshire down into the northern extent of Sherwood Forest.
- 5.15 There has to be a reasonable chance that some of this Roman landscape may survive as earthworks preserved within the woods and heaths of the Forest. Cropmark evidence can provide targets for archaeological evaluation and mitigation, but only really for investigation of Roman and possibly Iron Age settlement activity, and only in the arable fields of the northern part of the Sandstones.
- 5.16 Archaeological remains of the Prehistoric and Medieval are as elusive as on other geologies, while the area of the Forest offers particular problems for archaeological investigation; evaluation and mitigation techniques will need to take into full account the likelihood that the remains being sought will be scattered discrete features of a range of dates, and that water supplies may be of more significance than topography in identifying where past settlements are to be expected.

Coal

- 5.17 The future extraction of coal raises its own specific archaeological issues. In the concealed coalfield where extraction would be by deep mining, archaeological issues will relate mostly to the impacts of surface facilities on buried remains. In the exposed coalfield, where opencast extraction may be expected, or where existing spoil heaps may be re-worked there is a different set of archaeological issues.
- 5.18 Coal mining may have started in the County in the Roman period; there was certainly a healthy industry in place by the 14th C. Remains of coal extraction of the Medieval period or earlier will often have been destroyed by later mining, but where they have survived as earthwork

6. Summary of issues and options

- 6.1 In summary the new Minerals Local Plan will need to focus on the following key issues:
 - (a) Mineral extraction has yielded a wealth of information about the archaeology of Nottinghamshire particularly in the river valleys and relating to the Roman period.
 - (b) The merit of retaining a policy for protecting the archaeological resource at South Muskham needs to be reassessed.
 - (c) We need to develop techniques for archaeological evaluation, to improve our ability to locate Prehistoric and post-Roman remains.
 - (d) Similarly, we need to optimise the archaeological outcomes of extraction on geologies other than sands and gravels, through developing new approaches to mitigation.
 - (e) The development of new approaches to evaluation and mitigation across different geologies needs to be reflexive.
 - (f) The cost-effectiveness of differing approaches needs to be considered and monitored closely.
 - (g) While there is an increasing realisation of the significance of sites and features to local communities, there remains a clear need for input from appropriately qualified and experienced heritage professionals, to identify the need for work, its nature, and to monitor its progress and outcomes.
 - (h) For the future, a significant part of the outcome of archaeological work has to be the dissemination of results to the widest possible audience.

Key references

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- 4. The Archaeology of the East Midlands Cooper, N.J. (ed), 2006
- 5. **PPS 5 Planning for the Historic Environment** Department for Communities and Local Government, 2010
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