Nottinghamshire County Council

Nottinghamshire Minerals Local Plan

Background Paper

Industrial dolomite

January 2016

Purpose of background paper

This background paper summarises the evidence used to identify the main planning and environmental issues that surround industrial dolomite extraction.

Minerals are essential to support sustainable economic growth. Since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them. The Government, through the National Planning Policy Framework (NPPF), requires Minerals Planning Authorities to plan for an adequate and steady supply of minerals.

Other background papers supporting the Minerals Local Plan

- Aggregates;
- Safeguarding;
- Archaeology;
- Biodiversity;
- Brick clay;
- Hydrocarbons – oil and gas;
- Industrial Dolomite;
- Landscape;
- Flood Risk;
- Site Selection.

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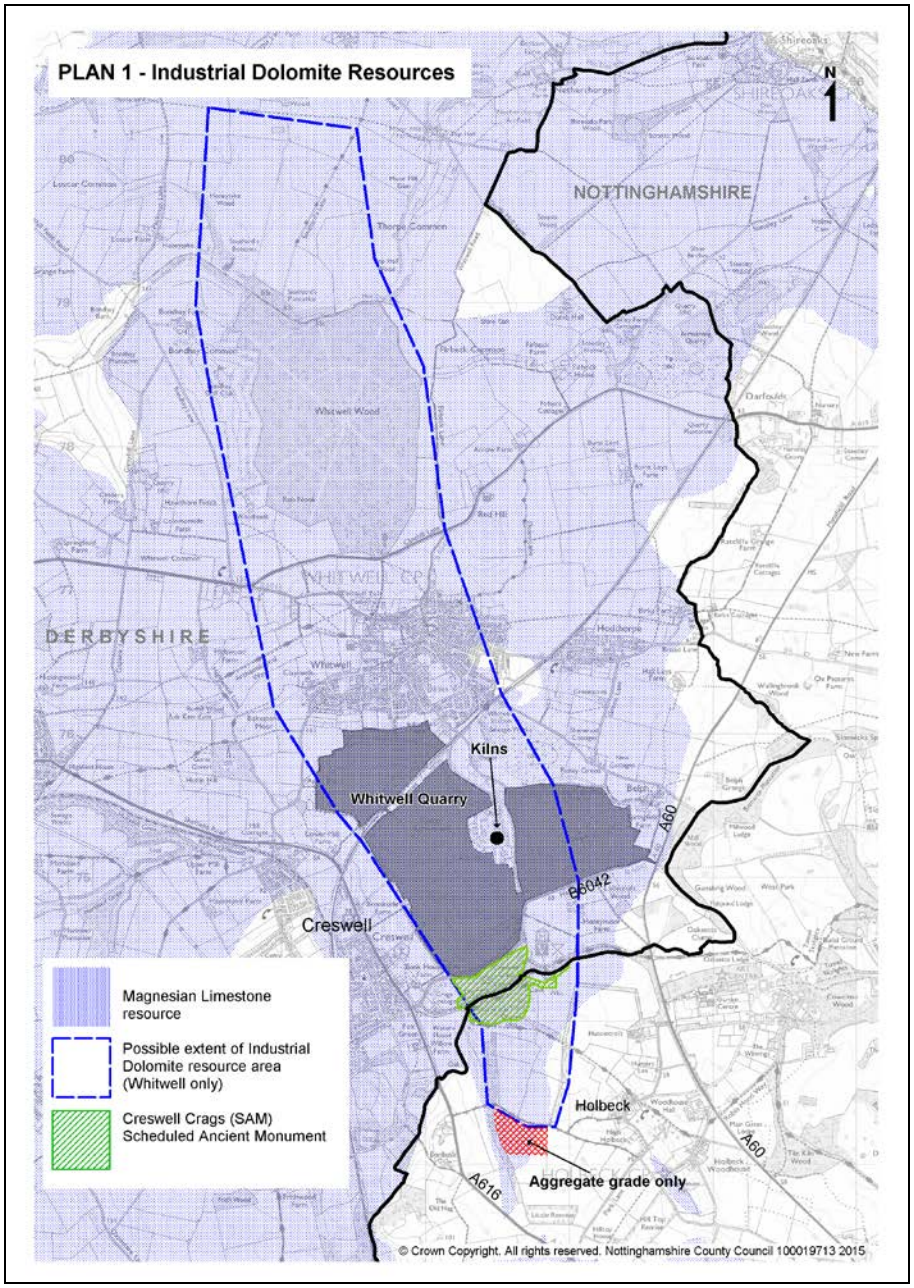
1. Introduction

1.1 Magnesian Limestone is the most significant limestone resource found in Nottinghamshire, occurring as a relatively narrow outcrop in the west of the County from Nottingham northwards to Mansfield and Worksop. The rock is so named because it contains variable quantities of the mineral 'dolomite' – a form of calcium magnesium carbonate that has replaced the original calcium carbonate, the primary mineral that makes up all limestone. Physically there is little to distinguish dolomite from limestone - both minerals are often found in close association and are widely exploited for aggregate purposes (see background paper on aggregate limestone for details). However the chemical distinction can be significant which, along with various impurities such as silica, sulphur and iron oxides, makes certain dolomites suitable for a wide range of industrial and other specialist uses.

1.2 In Nottinghamshire the Magnesian Limestone is currently exploited for aggregate and building stone purposes only, but one area of industrial grade mineral is known to exist in the north-west of the county to the south of Creswell Crags in Bassetlaw District. This resource represents the southernmost limits of an isolated pocket of industrial grade mineral centred on Whitwell in Derbyshire where it has been exploited for over 50 years. A further resource may exist at Steetley however the quality of the resource is not proven. See Plan 1.

1.3 As part of the Local Plan preparation process the industry recently indicated its intention to work the resource to the south of Creswell Crags for industrial dolomite and the site at Steetley was put forward primarily for limestone extraction and some small scale industrial dolomite extraction, however, the quality of the industrial dolomite at Steeley is unknown.

1.4 The remainder of this background paper considers the need for industrial dolomite, the main planning issues that surround its exploitation and what alternatives, if any, exist.



2. National production

2.1 Around 7.5 million tonnes of limestone and dolomite are extracted for industrial uses in the UK every year – a relatively small amount compared to the 55 million tonnes of limestone and dolomite used for aggregates every year[1]. The main sources currently worked are the high purity mineral found in parts of the Carboniferous Limestone outcrop such as found in Derbyshire and the Magnesian Limestone outcrop in County Durham and Derbyshire.

2.2 Industrial dolomite is a commercial term for dolomite used for non-construction purpose where its chemical properties are important. It accounts for a relatively small but important proportion of total dolomite

[1] Based on 2008-2012 figures, UK Mineral Statistics Yearbook 2013 British Geological Survey

output. Like limestone, dolomite used in construction is a low-value commodity however, this is not the case for industrial dolomite.

2.3 The principal uses of industrial dolomite is in the iron and steel making process, refractory uses and glass making, however it can also be used in chemicals, agriculture, asphalt filler, fertilisers and neutralisation. Some products, including those produced at Whitwell Quarry (adjacent to Creswell Crags in Derbyshire), are of international importance with 90% of the product exported to other countries worldwide with an approximate revenue of £21M.

2.4 There are a limited number of industrial dolomite producers in the UK. Lafarge Tarmac owns and supplies most of the rock for industrial dolomite production from three quarries; Whitwell Quarry (adjacent to Creswell Crags) in Derbyshire, Thrislington Quarry in County Durham and Cadeby Quarry near Doncaster (glass production uses only). The actual production of industrial dolomite is by Steetley Dolomite Ltd who owns and operates the kilns at Whitwell and Thrislington quarries and is the only UK producer of industrial dolomite for the steel industry.

2.5 Dolomites and dolomitic limestones of late Permian age crop out as a narrow, easterly dipping, north-south belt running for some 230km from Newcastle to Nottingham (see Figure 1 below). The crop is highly variable both regionally and locally in its geology and chemical and physical properties and therefore in its suitability for particular applications. Impurities such as silica, iron oxides and alumina are a prime consideration in the selection of dolomite for industrial applications.

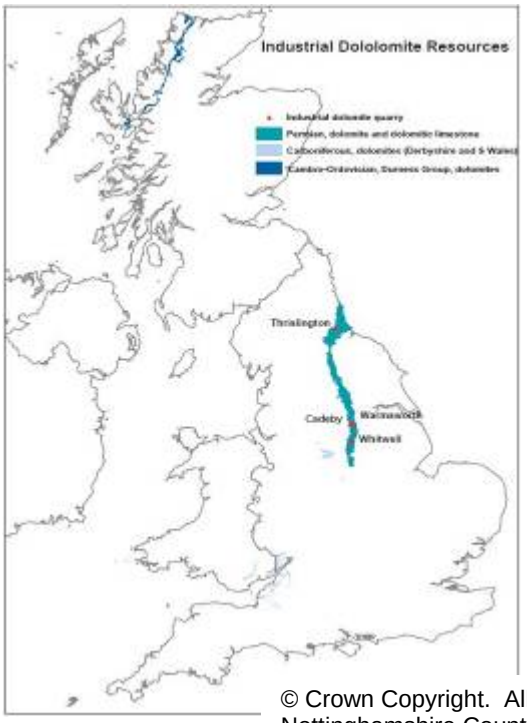


Figure 1

Source: British Geological Survey 2003. Digital Geological Map of Great Britain 1:625 000 scale (DiG Map GB-625) ɔosits data [CD-Rom]. Version 1.10 Keyworth, Nottingham: British Geological Survey. Release date 30-04-2003.

2.6 Permitted reserves of industrial dolomite need to be considered on a site-by-site basis and also by their suitability for specific applications. Plants producing industrial dolomite, and particularly those with kilns, require a large capital investment of the order of tens of millions of pounds and as such permitted and allocated reserves should reflect this investment as the longer term security of supply issues are of a concern to the industry.

2.7 Resources of high purity dolomite are scarcely distributed and the close association of the uses of dolomite with iron and steel making, both as a flux and refractory, has meant that the mineral is considered to be of considerable national importance..

3. Current production - Whitwell Quarry, Derbyshire

3.1 Whitwell Quarry has been in existence for over 50 years with pre- 2007 annual production running at around 1 million tonnes. This is split quite evenly between the industrial and aggregate grade rock with the latter occurring below the industrial mineral (see Table 1). The quality of the industrial mineral is variable and several parts of the quarry are usually worked at any one time in order to provide the required blends of mineral. All extractive operations are carried out by Lafarge Tarmac who supply the industrial mineral to two on-site kilns owned and operated by a separate company – Steetley Dolomite.

Table 1 Whitwell Quarry – Production 2004-2014 (x1000 tonnes)

Year	Industrial Grade	Aggregate	Total
2004	560	411	971
2005	534	435	969
2006	522	530	1,052
2007	558	640	1,198
2008	494	444	938
2009	311	404	715
2010	435	385	820
2011	449	374	823
2012	487	358	845
2013	465	519	984
2014	510	479	989

Source: Lafarge Tarmac – April 2015.

3.2 The kilns produce a wide range of refractory products for the iron and steel industry of which around 90% is exported to 28 countries spanning 4 continents reflecting the scarcity of this grade of mineral. The domestic iron and steel industry is mostly supplied from the company's sister quarry at Thrislington in County Durham. The company considers both quarries to be complementary and vital to its

success and ability to supply the full range of refractory products for domestic and world markets. Indeed these two quarries are likely to account for the bulk of the 1 million tonnes of refractory grade dolomite produced in the UK every year.

3.3 In addition Whitwell produces dolomite for glass making, agricultural lime and asphalt filler. The aggregate grade mineral is processed and marketed by Lafarge Tarmac.

3.5 In summary Whitwell Quarry is of international importance for its industrial dolomite and provides significant economic and employment benefits to the local community and national balance of payments.

4. Future provision

Whitwell Quarry

4.1 Permitted reserves of industrial and aggregate mineral at Whitwell are expected to be sufficient until 2035 through a series of small extensions to the existing site in Derbyshire which are being proposed by the mineral operator. Existing built development, key ridgelines that screen the quarry from Whitwell village and the proximity of the Creswell Crags Scheduled Ancient Monument will limit further options to extend the quarry further within Derbyshire after this time. Most of the remaining resource lies to the north of Whitwell but much of it underlies Whitwell Wood, which is a deciduous wood of local amenity value (see Plan 1). This area is also relatively remote from the kiln. There is a significant resource block north of the wood but it is even more remote from the kiln.

4.2 In terms of national policy there is no specific guidance on industrial dolomite provision but the general guidance set out in the National Planning Policy Framework (NPPF) provides some useful pointers. Paragraph 145 requires Minerals Planning Authorities to plan for a steady and adequate supply of minerals.

Steetley

4.3 The Steetley Resource is controlled by Clumber Land Ltd and is being prompted primarily for its aggregate potential. Uncertainty remains as to the quality of any industrial dolomite in this area. On its own the Steetley resource cannot be considered as a potential allocation at this time as it would be uneconomical to only work the industrial dolomite.

Key references

1. **National Planning Policy Framework, Department for Communities and Local Government, 2012**
2. **Industrial dolomite Mineral Fact Sheet** British Geological Survey 2006
3. **United Kingdom Mineral Statistics Yearbook** British Geological Survey 2013
4. **Derby and Derbyshire Minerals Core Strategy key issues and options** Derby City and Derbyshire County Councils 2010
5. **Resource Maps of National Magnesian Limestone and other industrial dolomite resources**