DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

Towards a Minerals Local Plan:

Spring 2018 Consultation

Background Paper Industrial Limestone

December 2017

Derbyshire County Council

Derby City Council

Contents

1. Introduction and Background

1.1 Limestone is often described as the world's most versatile mineral. In terms of the number of quarries and the scale of tonnage produced, around 10 million tonnes annually in recent years (average annual production 2007-2013[1]), it is by far the most significant mineral quarried within the Plan area.

1.2 Limestone is mainly quarried for use in the construction industry where its physical properties have made it the principal source of crushed rock aggregate for use as fill material, road stone and in the manufacture of concrete. A separate paper has been produced on the working of Limestone for aggregate uses.

1.3 Limestone is also a very important 'industrial' mineral where its chemical properties make it a valuable mineral for a wide range of industrial/manufacturing uses; recently[2] around 3 million tonnes has been quarried annually in the Plan area for this purpose. This paper is about 'industrial limestone', the term given to the mineral when it is used for manufacturing and industrial processes. A separate supporting paper has been produced about the specific use of industrial limestone in the manufacture of cement.

1.4 Limestone is also used on a very small scale along with sandstone as building stone. The availability of local stone to conserve the character of the Plan area's historic built environment is of local importance. A separate paper has been produced on the working of Limestone for building stone.

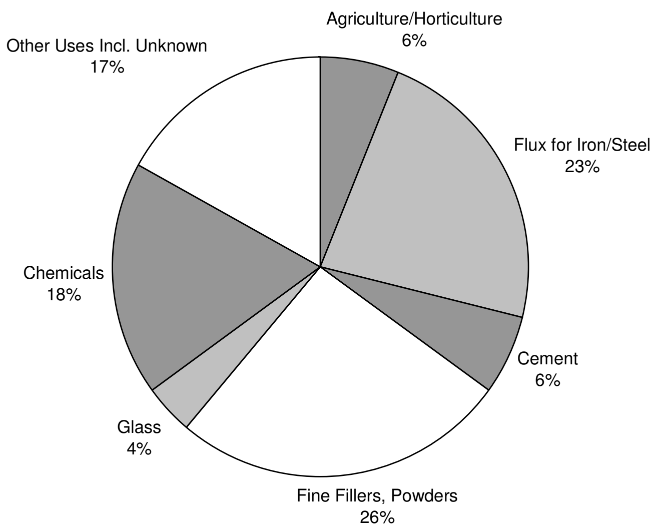
End uses

1.5 Industrial minerals serve as essential raw materials to the manufacturing industry, where the added value can be several times the cost of the mineral used. It can be crushed and used as for chemical applications, for example, in

[1] East Midlands Regional Aggregates Working Party Reports (2007-2013)
[2] East Midlands Regional Aggregates Working Party Reports (2007-2013)

flue gas desulphurisation, ceramics or glass production. It can be calcined (heated) and used in the production of cement or in the production of lime for use in steel making or water purification/sewage and effluent treatment. It can be coarsely ground and used in animal feeds/agriculture and carpet backing/plastic floor tiles or finely ground to produce a powder which is used extensively as a filler in a diverse range of products such as paints, plastics, paper, rubber, sealants, pharmaceuticals, food and drink etc. Most markets for industrial limestone are mature markets or are shrinking due to the decline in UK manufacturing. One growth area is limestone used for environmental applications and, in particular, for flue gas desulphurisation. Figure 1 shows the end uses of industrial limestone in the Plan area at 2010.

Figure 1: End Use of Industrial Limestone Produced in the Plan area 2010[3]



Source: East Midlands Regional Aggregate Working Party Report, 2010

2. National and Local Policy

National policy

2.1 The National Planning Policy Framework (NPPF) recognises that minerals are essential to support sustainable economic growth and our quality of life and

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[3] EMAWP Annual Report 2010

that it is important, therefore, that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs. It also recognises that minerals are a finite resource so it is important to make best use of them to secure their long term conservation.

2.2 There are no national demand targets for industrial minerals. Paragraph 146 states that Mineral Planning Authorities (MPAs) e.g. Derbyshire County Council and Derby City Council should plan for a steady and adequate supply of industrial minerals by cooperating with neighbouring and more distant authorities to coordinate the planning of industrial minerals to ensure adequate provision is made to support their likely use in industrial and manufacturing processes. Safeguarding or stockpiling should also be encouraged to ensure the minerals remain available for future use.

2.3 Additionally for particular uses, such as cement manufacture, the NPPF requires that MPAs should make provision for a stock (landbank) of permitted reserves of limestone to support the level of actual and proposed investment required to maintain or improve an existing plant or to provide a new kiln. For the maintenance and improvement of existing plant the landbank should be at least 15 years for primary cement materials (chalk and limestone) and secondary cement materials (clay and shale). To support a new kiln the landbank should be 25 years. These figures apply to individual sites or feeder sites rather than the whole Plan area.

2.4 NPPF, paragraph 163, requires that, in preparing local plans, MPAs should develop and maintain an understanding of the extent and location of mineral resources in their area and assess the projected demand for their use taking into account any opportunities to replace the need for primary minerals. NPPF, paragraph 182 sets out the need for plans to be positively prepared based on a strategy which meets objectively assessed development requirements, including unmet requirements from neighbouring authorities where it is reasonable to do so and consistent with achieving sustainable development.

National Planning Practice Guidance

2.5 The National Planning Practice Guidance (NPPG) sets out guidance on how MPAs should plan for the steady and adequate supply of minerals (in order of priority):

- designating Specific Sites – where viable resources are known to exist, landowners are supportive of minerals development and the proposal is likely to be acceptable in planning terms. Such sites may also include essential operations associated with mineral extraction
- designating Preferred Areas, which are areas of known resources where planning permission might reasonably be anticipated. Such areas may also include essential operations associated with mineral extraction, and/or
- designating Areas of Search – areas where knowledge of mineral resources may be less certain but within which planning permission may be granted, particularly if there is a potential shortfall in supply.

2.6 National Planning Practice Guidance (NPPG) provides additional advice on how MPAs should plan for industrial minerals. It suggests that recognition should be given to any marked differences in geology, physical and chemical properties, markets and supply and demand between different industrial minerals, which can have different implications for their extraction. Such differences include:

- geology influencing the size of a resource, how it may be extracted and the amount of mineral waste generated
- the market demand for minerals to be of consistent physical and/or chemical properties, resulting in the fact that industrial minerals are often not interchangeable in use
- the potential for the quality of a mineral extracted from a single site varying considerably
- the economic importance of the mineral as a raw material for a wide range of downstream manufacturing industries

- some industries are dependent on several industrial minerals and the loss of supply of one mineral may jeopardise the whole manufacturing process.

2.7 The NPPG also provides advice on the purpose of stocks (landbanks) of permitted reserves and how and when the required stock of permitted reserves for industrial minerals should be calculated. Stocks of permitted reserves should be used as an indicator to assess when further permitted reserves are required at an industrial minerals site. They should be calculated when a planning application is submitted to extract the mineral (through either a site extension or a new site) or when new capital investment is proposed. The overall amount required should be directly linked to the scale of capital investment to construct and operate the required facility (such as a cement plant or brick factory).

2.8 The NPPG includes guidance on the 'Duty to Co-operate' regime which requires local planning authorities, County Councils and public bodies to engage constructively, actively and on an on-going basis on strategic cross boundary matters.

3. Method of Working/Processing/Transportation/Restoration

3.1 Almost all Industrial Limestone in the UK is worked from surface quarries. The potential for the quality of the mineral extracted from a single site may vary considerably. This may require multiple extraction faces within one quarry, or supplies of specific feedstock from several different quarries, to enable blending of lower specification material with that of a higher grade. Alternatively, it may result in only a small proportion being suitable for specific industrial end uses, with remaining minerals being used for alternative purposes such as aggregates.

3.2 Processing of limestone can simply be divided into crushing/grinding, sizing and storage prior to loading and transportation. Chemical stone is sold as lime or lumpstone of specified particle size. Lime is produced by burning the stone in a kiln, the residue of calcium oxide or ‘quicklime’ is then sold as lump lime, pulverised lime or is hydrated and sold as hydrated lime to meet specific customer requirements. Limestone powders for use as fillers are produced by grinding the limestone to a fine powder.

3.3 The price of an industrial limestone product is largely governed by the cost of extraction, processing and transportation. The processing plants associated with industrial minerals are generally large and require high capital investment, particularly for cement and lime manufacture.[4] This has led to the development of large quarries that can produce large outputs over long periods of time. Because transport costs may exceed production costs, it is important for the quarry to have good road, rail and/or water transport links and for the most appropriate form of transportation to be used.[5] Limestone, for both industrial and aggregate purposes, is currently the only mineral quarried within the Plan area where the scale of working has made it cost effective to transport the mineral product to market by rail.

3.4 The scale of the limestone quarries and the often relatively small quantities of waste material generated compared to the rock taken out means that it is not generally possible to restore land to its original levels following completion of working. Final restoration depends to a large extent on the depth of the quarry and level of the water table. Natural regeneration incorporating water is usually appropriate for deep quarries and, in such cases, they can become important areas for wildlife and natural history. In cases where the depth is not too great, the quarry floor can be restored for agriculture or informal leisure uses.

4. Industrial Limestone Resources

4.1 Although limestones occur widely in England, many are unsuitable for industrial use because of their chemical and/or physical properties. The Carboniferous

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[4] BGS & ODPM, Industrial Minerals:Issues for Planning, 2004,p12
[5] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p174

Limestone and Cretaceous-age Chalk are the main important resources of industrial limestone in England.[6]

4.2 Within the Plan area, the three main areas of Industrial Limestone production are the Buxton and Wirksworth areas of the Carboniferous Limestone, bordering the Peak District National Park, and the Permian Limestone area around Whitwell.

Carboniferous limestones

4.3 The Carboniferous limestones of the Plan area are noted for their thick, uniformed beds over wide areas and for their very high chemical purity and consistency of certain beds which are highly valued for a range of industrial uses.

4.4 Carboniferous limestones in Derbyshire (geographical area) are generally pale coloured, massive (no bedding planes) or thickly bedded limestones which were deposited in a relatively shallow water environment. They are uniform in composition over wide areas and are often of very high purity (>98% Calcium Carbonate). The carboniferous limestone is also a resource of good quality aggregate materials[7].

4.5 The Bee Low Limestones, a unit of consistently very high purity and uniform chemistry, provide most of the Carboniferous limestone quarried in Derbyshire (geographical area). The formation typically contains limestones with only small proportions of magnesium oxide (MgO), silica, alumina, iron and other impurities. The purity is locally downgraded in beds adjacent to clay bands and igneous horizons (basaltic lavas and tuffs) which are locally inter-bedded with the limestone. The zone of alteration is, however, usually less than 2m and impurities rarely total more than 5% of the rock. The Bee Low Limestones are extensively dolomitised in the Matlock-Wirksworth area, containing high levels of magnesium oxide, mostly in the range 18.0-20.5% MgO. In the past, they

[6] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p7
[7] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p7

have been valued for their MgO content and between 1963 and 1966 were used for the extraction of magnesium metal (Mg). They are not currently worked for this purpose.[8]

4.6 The Bee Low Limestones generally produce strong, low porosity, aggregate materials, although where dolomitised in the Matlock-Wirksworth area they are relatively porous and weak. However, even the poorest quality limestone aggregate from Derbyshire (geographical area) is harder and less porous than, for instance, most Jurassic limestone or chalk aggregates. The Bee Low Limestones are also the most important source of industrial limestone with a range of applications, including lime production, soda ash manufacture, flue gas desulphurisation, glass making and as filler in paint, rubber and plastics.[9]

4.7 The beds immediately beneath the Bee Low Limestones, termed the Woo Dale Limestones are not widely exposed, although they are worked in several quarries. The Woo Dale beds are also of high purity and together the two formations (Bee Low and Woo Dale) comprise over 300m (thickness) of industrial limestone resources. The Woo Dale Limestones are slightly dolomitised in the Buxton area, but MgO values are generally less than 1%. Purity remains high throughout the uppermost 100m of strata but, lower in the sequence, the unexposed beds contain higher silica, alumina, iron and sulphur contents.[10]

4.8 The limestone sequence above the Bee Low is much more varied chemically and somewhat less pure. The Monsal Dale and Eyam Limestones both contain cherty and shaly beds and the Monsal Dale Limestones also contain several volcanic (lavas and tuffs) units which make up a large proportion of the total thickness in the Matlock-Ashover area. Both limestone formations produce good quality aggregates, and are used in concrete and road construction (except road surfacing). The resource potential of the Derbyshire limestones is locally affected by the presence of other minerals. Fluorspar, barytes and lead

[8] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8

[9] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8

[10] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8

are confined mostly to veins and replacement bodies in the Matlock-Ashover-Wirksworth area. However, the effects are localised and restricted generally to the width of the mineral vein or body.[11] A separate Paper has been produced on Vein Minerals within the Plan area.

Permian limestones

4.9 Where there is a significant content of calcium magnesium carbonate, or magnesium carbonate, the mineral is known as 'dolomite'. The Permian Limestone is the main source of dolomite in Britain. It extends in a narrow belt, almost continuously from Durham to Nottinghamshire. A small part of the outcrop (the Cadeby Formation) occurs in the north-east of the county, to the east of Bolsover.[12]

4.10 The Permian Limestone is highly variable, both regionally and locally, in its physical, mechanical and chemical properties and thus its suitability for particular applications. The formation is quarried for a range of construction uses, mostly for fill and sub-base material, and, less commonly, for concrete aggregate and coated roadstone. Some is used for block making and for building stone. It is inferior to Carboniferous limestones as a source of aggregate because of its variable character, and generally lower strength and higher porosity. Impurities such as silica, iron and alumina are a prime consideration in the selection of dolomite for its various industrial applications. At Whitwell Quarry, the upper part of the dolomite has a sufficiently low silica and iron oxide content for it to be used, after processing, as a refractory raw material and as a flux for steelmaking. The underlying dolomite is utilised for a range of construction applications.[13]

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[11] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8
[12] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8
[13] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p9

Relationship with aggregate limestone

4.11 In the excavation of high grade industrial limestone, rock of all grades will necessarily be produced[14] and most producers of industrial limestone also produce aggregates in order to obtain sales from all of the grades of limestone excavated. There are no fundamental reasons why, in terms of the mechanical structure of the rock, industrial quality limestone cannot be used for aggregate purposes. However, in view of the relative limited occurrence of 'industrial' limestone it is important to make the best use of this scarce resource and therefore minimise the use of this material for aggregate purposes.

Safeguarding

4.12 Since minerals are a finite resource it is important to ensure that non minerals development does not needlessly prevent the extraction of known mineral resources of local and national importance. One way of achieving this is through the inclusion of resources within Mineral Safeguarding Areas. The Carboniferous and Permian Limestones are important industrial limestone resources within the Plan area. In preparing the Minerals Local Plan we will need to assess which limestone resources and how they should be safeguarded.

5. Specification

5.1 In seeking to identify limestone as being fit for particular industrial applications there are many different qualities of the mineral which need to be taken into account. Limestone consists principally of calcium carbonate; with an increase in magnesium carbonate limestone grades into dolomite. Most limestones contain varying amounts of impurities in the form of sand, clay and iron bearing materials. These impurities are usually present in small proportions in 'industrial' limestones which are generally valued for their 'high purity' (greater than 96-97% calcium carbonate defining high purity limestone and greater than 98-98.5% being very high purity limestone). For many applications, however,

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[14] BGS & ODPM, Industrial minerals:Issues for Planning, Annex B, p100, 2004

it is the level, or absence, of the specific impurities present or the consistency or colour of the limestone which are of paramount importance, rather than the absolute values for calcium carbonate. For this reason, the Plan uses the term ‘industrial’ limestone rather than ‘high purity’ limestone.

5.2 Industrial limestone is consumed in a wide range of end uses based on its diverse physical and/or chemical properties. In some cases, it is valued solely as a source of specific chemical elements, or compounds, for example for use as chemical feedstocks, in cement making or as plant nutrients. For others it is a combination of physical properties, such as particle size and shape, natural and fired brightness (whiteness), plasticity, viscosity in suspension and density that form the basis for commercial exploitation. However, in many cases it is a combination of physical and chemical properties that are desired.

5.3 The different markets for specific industrial limestone demand different combinations of properties. Subtle differences in their properties can make the performance of a specific industrial mineral quite different from one deposit to another. Consequently, individual deposits may be aimed at particular products or markets and as a result some specifications for particular products or markets are written around specific deposits. This means that specific individual deposits of industrial minerals are often not interchangeable in their use.

End Uses

5.4 Limestone is used in a number of industries where its chemical properties as a basic oxide, flux, neutralising agent or source of calcium are important. It can be crushed and used as for chemical applications, for example, in flue gas desulphurisation, ceramics or glass production. It can be calcined (heated) and used in the production of cement or in the production of lime for use in steel making or water purification/sewage and effluent treatment. It can be coarsely ground and used in animal feeds/agriculture and carpet backing/plastic floor tiles or finely ground to produce a powder which is used extensively as a filler in a diverse range of products such as paints, plastics, paper, rubber, sealants, pharmaceuticals, food and drink etc.

5.5 Many high volume applications of limestone powders (such as agricultural lime, carpet backing and asphalt manufacture) do not require ‘high purity’ limestone and are sourced from a variety of quarries across the UK. In contrast, powders used in applications such as pharmaceuticals and food must be of very ‘high purity’. Limestone powders used as fillers in paper, plastics and high quality paints typically require particle sizes within a closely defined range, along with high brightness (whiteness), good rheological (fluid) properties and low oil absorption. Particle sizes range from relatively course grades, with 90% less than 50 microns to fine grades with material less than 5 microns. Figure 2 sets out the different grades of limestone powders for filler applications.

Figure 2: Limestone powders for filler applications

Coarse fillers (generally low value); 75 micron to several millimetres	- agricultural lime - animal feedstuffs - asphalt - fertilisers
Medium fillers (generally medium value); Less than 50 microns	- carpet backing - floor tiles - sealants - adhesives and putties
Fine fillers (generally medium value); Maximum particle size 50 microns; 50% less than 2 microns	- paper fillers - rubbers and plastics - cheaper paints
Very fine fillers and pigments (generally high value);maximum particle size 10 microns; 90% less than 2 microns	- paper coatings - paints - rubbers and plastics

Source: Industrial Minerals Issues for Planning, BGS, 2004, p174

6. Demand

6.1 There are no national demand figures for industrial limestone production. The industry is market led and production is closely related to demands in the manufacturing industries; indeed some industrial mineral producers are also major manufacturers. Of the total production of industrial mineral approximately 50%[15] is not sold on the open market but used capitvely in the manufacture of value-added products.

6.2 Most of the markets for industrial carbonates are mature, or in decline, due to the decline of UK manufacturing, particularly iron and steel production. However, flue gas desulphurisation has emerged as a major market for limestone since 1994, although this market is tied to the future of coal-fired power generation in the UK.[16]

Alternatives/recycling

6.3 The fact that industrial limestone is valued for its physical and/or chemical properties means that opportunities for its substitution and recycling are limited. Additionally, the intrinsic properties of industrial minerals are often changed irreversibly in the manufacturing process making them difficult to be reused or recycled. However, calcium carbonate is recovered from the sugar refining process and sold for agricultural purposes.

6.4 Limestone and chalk powders used as fillers compete with other minerals such as kaolin or talc. Because limestone and chalk powders tend to be of lower cost relative to those other minerals, limestone has tended to increase its market share relative to many other minerals in the filler market. Recycling of paper and some plastics allows the mineral component to be recovered. Recycling glass also recycles lime and soda ash used in their manufacture. [17]

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[15] BGS, Industrial Minerals: Issues for Planning, 2004

[16] UK Minerals Forum, Trends in UK Production of Minerals, 2014

[17] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p174

Economic importance

6.5 In terms of wealth created by United Kingdom minerals production, figures show that at 2014, the construction and industrial minerals sector contributed just 9 % of total wealth compared to the oil and gas sector's 90%[18]. However, the importance of construction and industrial minerals as essential inputs to downstream industries, mainly within the manufacturing and construction sectors, needs to be recognised.

6.6 Minerals working can provide an important source of local employment both in rural and former coal mining areas. In 2014, the most recent date that statistics are available, 1,514[19] people we employed in limestone and dolomite working in Derbyshire; 870 were directly employed, 50 were employed by contractors and 594 were drivers (based on an average week).

7. Production and Reserves

7.1 Nationally, within Great Britain, the production of limestone, dolomite and chalk for agricultural uses e.g. agricultural lime has remained fairly constant within the range of 1.5 mt to 2 mt within the period 2002-2014. The production of the same minerals for industrial uses over the same period has seen a decline from around 9.0 mt in 2002 to 7.5 mt in 2014.[20]

7.2 There are no national level figures for total permitted reserves of industrial limestone, although due to the high capital investment required to process industrial minerals, most major sites command extensive reserves. There are also reserves of limestone that would be suitable for industrial use at quarries that do not produce limestone for non-aggregate purposes.[21]

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[18] Page 9, United Kingdom Minerals Yearbook 2015, BGS Minerals and Waste Programme Open Report OR/16/021, 2015
[19] Business Monitor PA1007, 2014, DCLG, Mineral Extraction in Great Britain
[20] BGS, United Kingdom Minerals Yearbook, 2015
[21] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p173

7.3 The annual production of industrial limestone from the Plan area has remained fairly steady at around 3 million tonnes over the last 5 years[22]; in line with the national trend demand[23] is not expected to increase significantly over the plan period. At the end of 2013 the Plan area had total estimated reserves of some 228[24] million tonnes (active and inactive sites) of industrial limestone, equivalent to over 75 years of production at current rates.

Industrial limestone quarries in the Plan area

Active sites

7.4 In 2013, a total of nine quarries produced industrial limestone within the Plan area, their location is shown on Figure 4 and further details set out in Figure 3 below. Most of these quarries also produce limestone for aggregate use and in some cases industrial limestone production is quite low, which has been indicated on the table. Permitted reserves for industrial uses totalled some 197[25] million tonnes at active sites.

Figure 3 Active Industrial Limestone Quarries, 2014[26]

Quarry	Operator	Industrial mineral / product produced
Ashwood Dale Quarry, Buxton	Omya UK Ltd	Industrial Carbonate
Bone Mill Quarry (Ryder Point, Taylor's), Hopton (less than 10% industrial)	Longcliffe Quarries Ltd	Agricultural Lime
Brassington Moor Quarry (Longcliffe)	Longcliffe Quarries Ltd	Agricultural Lime Industrial Carbonate
Brierlow Quarry (Hindlow Works), Buxton	Lhoist UK Ltd	Lime Industrial Carbonate
Dove Holes Quarry, Buxton (less than 10% industrial)	CEMEX UK Ltd	Agricultural Lime
Dow Low Quarry, Buxton	Hope Construction Materials (now Breedon Group)	Industrial Carbonate Agricultural Lime

[22] EMRAWP Annual Reports 2009-2013
[23] UK Minerals Forum:Trends in UK Production of Minerals Jan 2014 – 7.8 Industrial Carbonates
[24] EMAWP Annual Report 2013
[25] EMAWP Annual Report 2013
[26] BGS, Directory of Mines and Quarries, 2014

Grange Mill Quarry, Wirksworth	Ben Bennet Jnr Ltd	Agricultural Lime Industrial Carbonate
Tunstead Quarry (Tunstead - Old Moor), Buxton	Lafarge Tarmac	Lime Cement Manufacture Industrial Carbonate
Whitwell Quarry, Whitwell	Lafarge Tarmac	Dolime Industrial Carbonate

Note: Source table shows Dene Quarry as active but MPA aware this site was mothballed in 2013 and therefore removed from the table

7.5 Three quarries, Whitwell, Ashwood Dale and Aldwark/Brassington Moor, are anticipated to run out of permitted reserves of industrial limestone before the end of the Plan period. The quarry operators are promoting extensions to these sites, all of which raise important 'duty to co-operate' issues. Further information is set out in the Appendix.

Inactive industrial limestone quarries

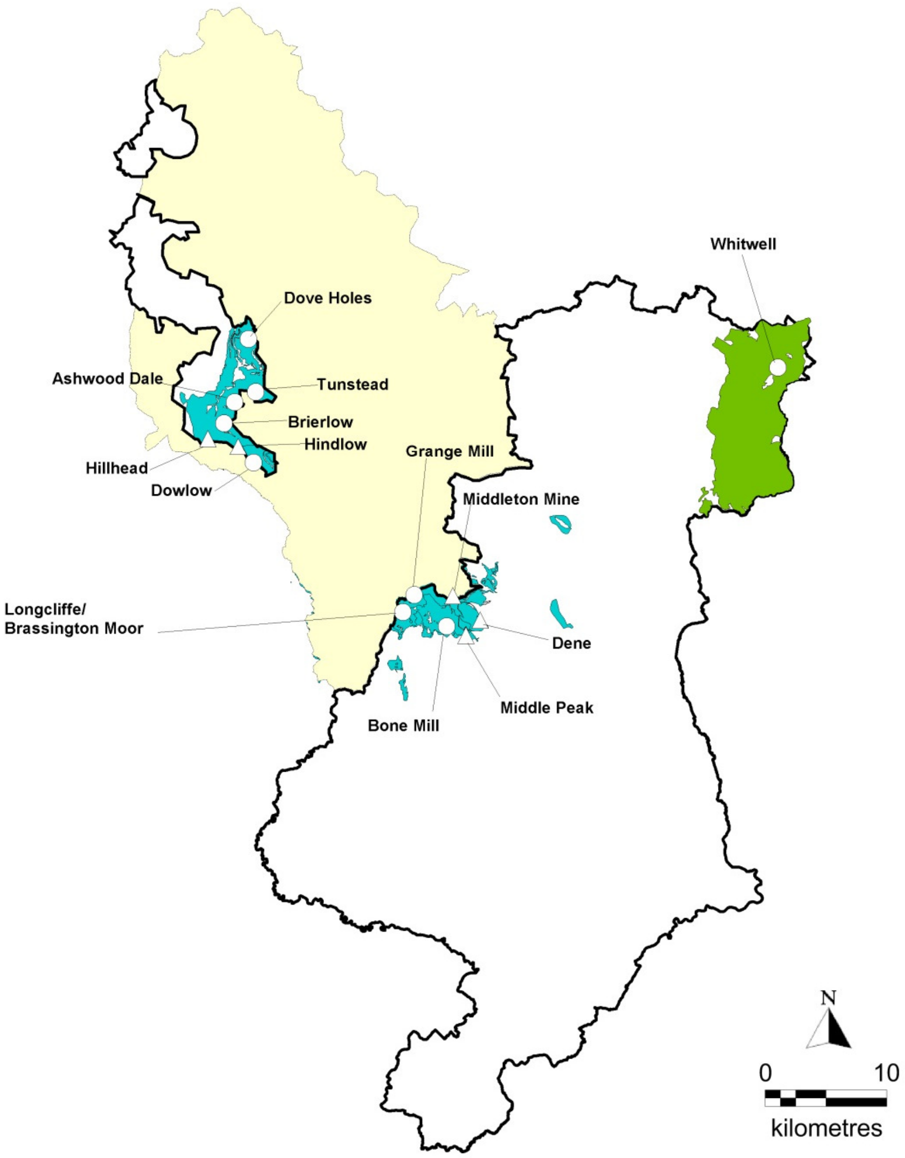
7.6 In addition, a further five quarries have reserves of industrial limestone (in total around 31 million tonnes[27]), and would not require a new planning permission to resume extraction, but are not currently producing industrial limestone.

- Hillhead Quarry, Buxton (Lafarge Tarmac) - Working is temporarily suspended as operator has sufficient reserves at other sites.
- Hindlow Quarry, Buxton (Lafarge Tarmac) - No quarrying since 1988, limestone is imported from Tunstead by rail and processed at the plant at Hindlow Quarry. The operators have stated that the considerable reserves at Hindlow form an integral part of the company's long term resources and a resumption of quarrying will take place in the future.
- Middle Peak , Wirksworth (Lafarge Tarmac) – No production since 2005.
- Middleton Mine, Wirksworth (Lafarge Tarmac) – No production since 2005.
- Dene Quarry, (Lafarge Tarmac) – Site has been mothballed for operational reasons.

[27] EMRAWP Annual Report 2013

7.7 Ongoing work will be required to establish the contribution that individual quarries (particularly inactive sites) are likely to make to the supply of industrial limestone over the Plan period.

Figure 4: Active and inactive industrial limestone quarries within the Plan area – 2017



Title

Limestone Resources with Active and Inactive Industrial Limestone Quarries

Key

- Plan Area
- Producing site
- Inactive site
- Extent of Surface Permian Limestone Resource
- Extent of Surface Carboniferous Limestone Resource
- Peak District National Park Area

8. Conclusions – Issues for making provision for the supply of Industrial Limestone

8.1 Given the overall level of permitted reserves of industrial limestone and the anticipation that levels of output will not increase greatly during the Plan period, there is on the face of it no need in overall numerical terms to allow for additional industrial limestone working. However, because of the wide diversity of industrial limestone markets and the chemical variability within some deposits, as discussed in this Paper, shortages in the availability of some particular qualities of mineral may occur which would result in the need for additional reserves. It is important therefore that our policy approach is flexible to allow the working of additional industrial limestone in such cases.

8.2 Where we know at the outset that there is a need for additional reserves to be worked over the Plan period then the Plan needs to decide whether to make provision for additional working, in those circumstances, through the specific allocation of sites or through a criteria based approach.

8.3 Additionally, because the need for very particular chemical specifications may require selective working of the mineral, this can result in an increase in the production of non-industrial grade stone. The Plan therefore needs to guard against the use of high specification materials for uses that do not require those specifications, in accordance with the principle of making the most sustainable and efficient use of mineral resources.

Appendix

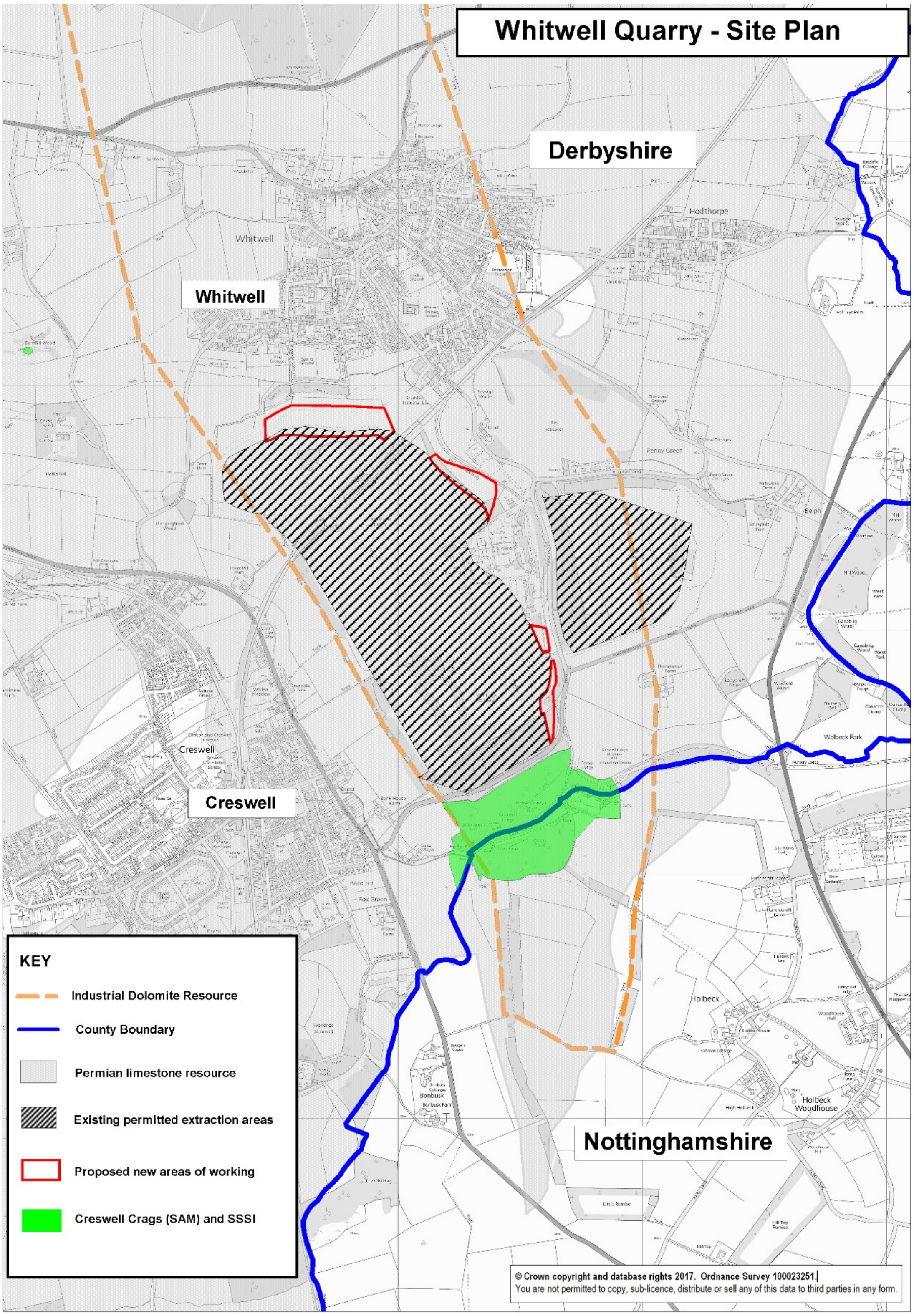
Sites promoted by mineral operators for allocation in the Minerals Local Plan

Further information can be found in Chapter 14 of the Plan.

Whitwell Quarry

The operator Tarmac Ltd is promoting four extensions to the existing quarry at Whitwell. Whitwell Quarry lies on the Permian Limestone resource to the north east of the County to the east of Bolsover. The quarry is long established where dolomitic limestone is extracted principally to supply the industrial limestone market. High grade stone is processed at the adjacently located Whitwell Works (operated by Lhoist), mainly to form refractory products for use in the manufacture of steel; a large percentage of which are exported. Mineral of lesser quality is used to produce agricultural lime and a range of construction grade aggregates. Annual mineral production averages around 1 million tonnes split 50/50 between the industrial and aggregate uses.

The proposed four extension sites will generate an additional 3.23 mt of industrial limestone thereby providing a supply of high grade stone for a further 6 years beyond the existing permitted reserves. These relatively small extensions represent the last economic industrial limestone reserves at Whitwell Quarry from within the Plan area. A planning application, CM5/0416/4, has been submitted to work these areas and has been granted subject to the finalisation of a Section 106 agreement.



Whitwell Quarry - Site Plan
Derbyshire
Whitwell
Creswell
Nottinghamshire
KEY
Industrial Dolomite Resource
County Boundary
Permian limestone resource
Existing permitted extraction areas
Proposed new areas of working
Creswell Crags (SAM) and SSSI
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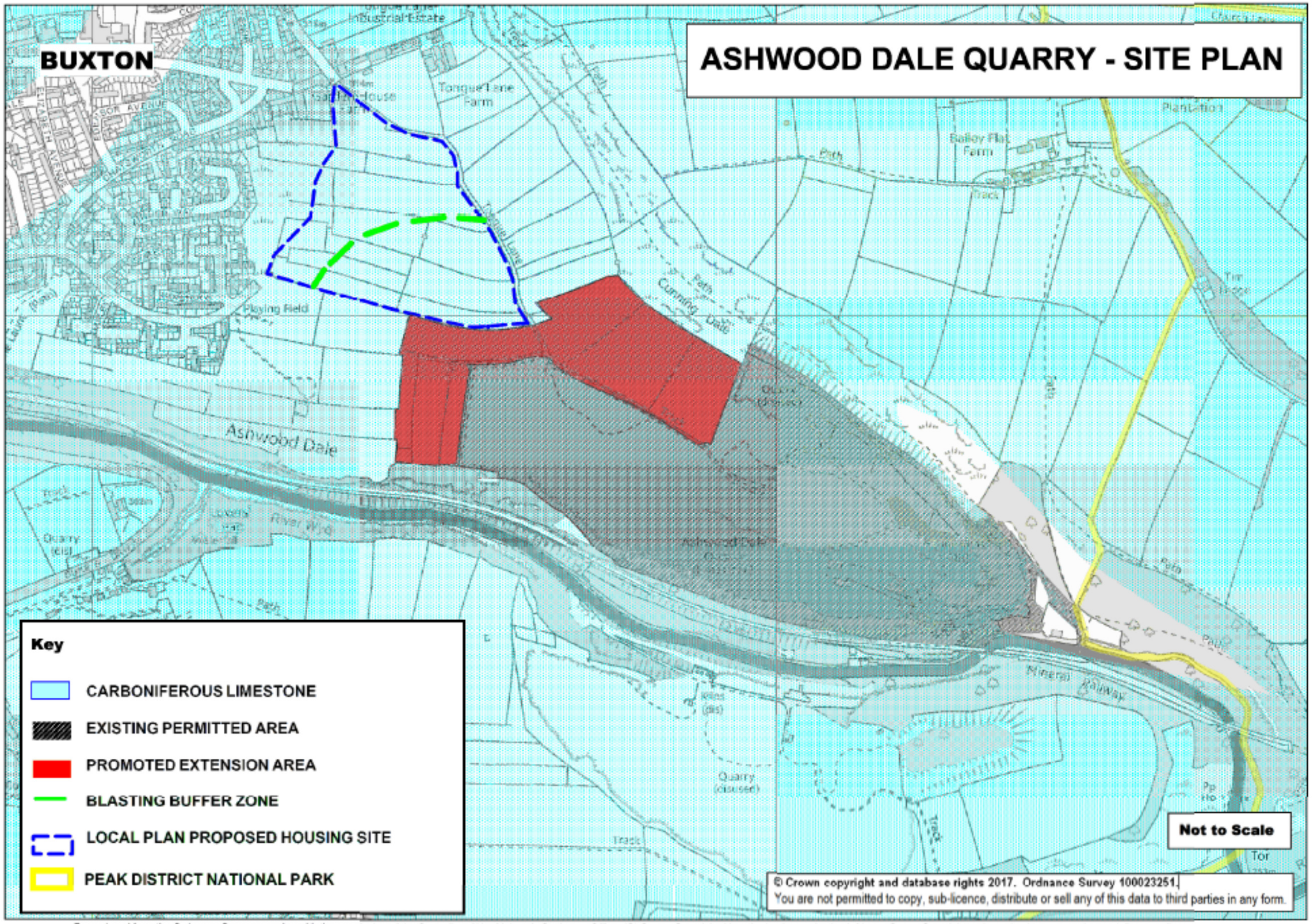
Ashwood Dale Quarry

Ashwood Dale Quarry, operated by Omya UK Ltd, lies within the Carboniferous Limestone resource around the Buxton area. Limestone is extracted for both industrial and aggregate purposes; information from the operator indicates that estimated annual future production rates amount to 135,000 tonnes of limestone for industrial purposes and 65,000 tonnes for aggregate uses. All stone processing occurs at Ashwood where the stone is crushed and milled.

The quarry principally produces industrial limestone products which are high purity, fine powders; these are used in the following markets: ceramic tiles and refractories, glass production, adhesives and sealants, and resin polymers and fillers. Industrial limestone is also used to produce animal feed and agricultural lime. The quarry supplies both local and national markets with industrial minerals.

The colour and chemical purity of the limestone are critical for the sale of industrial products. The quarry contains two types of limestone the lighter coloured high quality industrial stone and the darker aggregate stone. The light stone is capable of producing industrial products without blending, however the darker stone cannot produce industrial products unless it is blended with the lighter stone. The promoted extension area would yield approximately 4.8 Mt of predominantly light stone although the dark stone here is of better quality then the dark stone in the existing quarry. It is proposed to blend the light and dark stone within the extension area at a ratio of 71%/29% in order to maximise the amount of industrial stone produced. All the stone from the extension area would be used for industrial products. A planning application, CM1/0315/158, has been submitted to work this site; planning application CM1/0315/139 to extend the time limit for working the existing quarry has also been submitted.


ASHWOOD DALE QUARRY - SITE PLAN
BUXTON
Tongue Lane Farm
Playing Field
Ashwood Dale
Cunning Dale
Bailey Flat Farm
Plantation
Path
Track
Mineral Railway
Quarry (disused)
Key
CARBONIFEROUS LIMESTONE
EXISTING PERMITTED AREA
PROMOTED EXTENSION AREA
BLASTING BUFFER ZONE
LOCAL PLAN PROPOSED HOUSING SITE
PEAK DISTRICT NATIONAL PARK
Not to Scale
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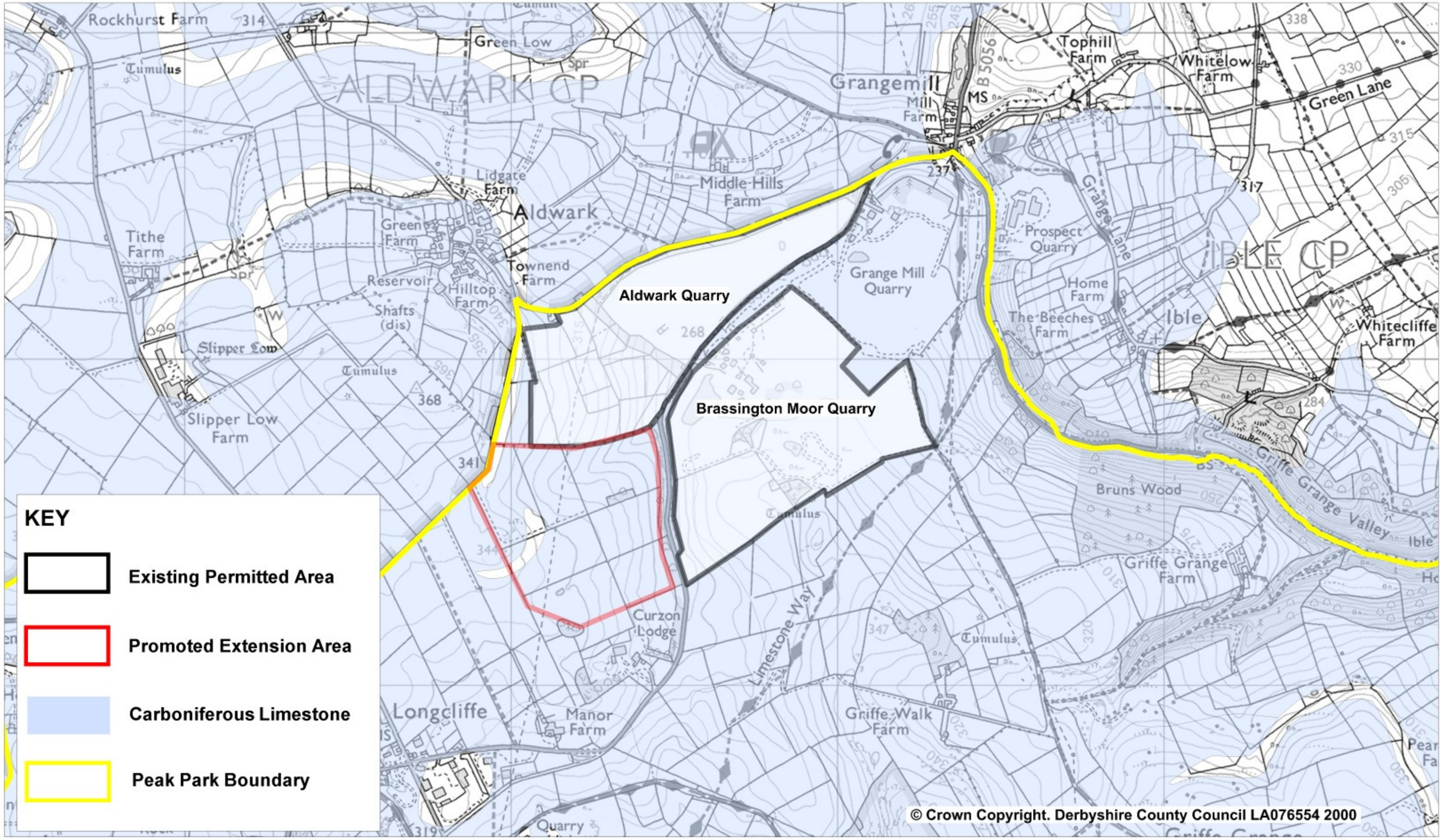
Aldwark/Brassington Moor Quarry

Aldwark/Brassington Moor Quarry lies within the Carboniferous Limestone Resource centred on the Matlock/Wirksworth area. The quarry is currently operated by Longcliffe Quarries Ltd. It produces dried, milled and classified calcium carbonate powders and granules. These are crucial raw materials for the production of animal feed, glass, sealants and adhesives, mastics, plastics and rubber. It also produces bright (white) dusts for precast concrete products and significant volumes of agricultural lime. By-products from these mainstream products are also sold for construction uses. Recent production rates have averaged just below 1mt split equally between industrial and aggregate uses.

Some of the products produced require exacting specifications of mineral which impacts on the suitability of reserves at the quarry. Of particular importance for animal feed products are reserves that are low in cadmium, iron and lead which occur at different locations and depths throughout the quarry. The Company estimates that these reserves will be exhausted between 2025 and 2031. It is proposing an extension to the quarry that would yield approximately 38 mt of reserve generating between 6.8 and 12.2 mt of low cadmium reserves.



Aldwark/Brassington Moor Quarry