DERBYSHIRE AND DERBY MINERALS LOCAL PLAN

Towards a Minerals Local Plan:

Winter 2021/2022 Consultation

Proposed Draft Plan

Background Paper Industrial Limestone

December 2021

DERBYSHIRE County Council

Derby City Council

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1. Introduction and Background

1.1 This is one of a series of papers providing background information to accompany the preparation of the new Minerals Local Plan. The new Plan will include strategies and policies concerning the extraction of industrial limestone. This paper provides detailed information regarding the economic considerations of working the mineral; national and local policy considerations; the way in which the mineral is worked and existing resource and future supply implications. It concludes with the issues that the Plan will need to address.

1.2 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 12 million tonnes (mt) in 2019[1], it is by far the most significant mineral quarried within the Plan area.

1.3 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 background paper has been produced on the working of limestone for aggregate uses.

1.4 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; within the recent past [2] around 3 mt 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 background paper has been produced about the specific use of industrial limestone in the manufacture of cement.

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[1] East Midlands Aggregates Working Party: Annual Minerals Survey (2009-2019)

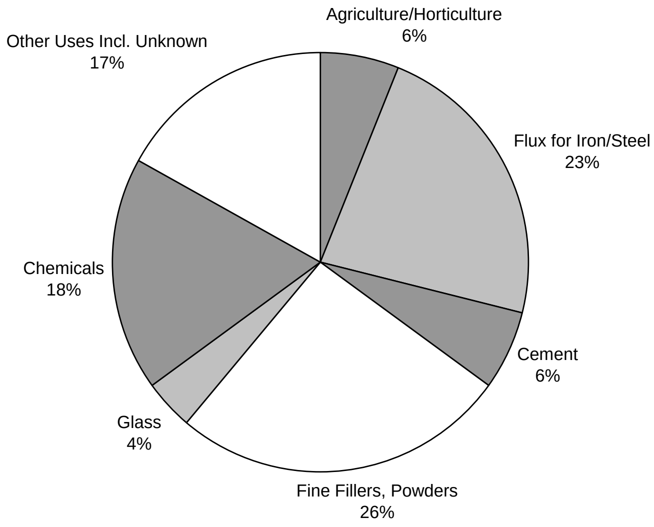
[2] East Midlands Aggregates Working Party: Annual Minerals Survey (2009-2019)

1.5 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 background paper has been produced on the working of limestone for building stone.

End uses

1.6 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 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. 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 Uses of Industrial Limestone Produced in the Plan area 2010[3]



Source: East Midlands Regional Aggregate Working Party Report, 2010

2. National and Local Planning Policy

National policy

2.1 The National Planning Policy Framework (NPPF)[4] , specifically relating to the preparation of local plans, requires Mineral Planning Authorities (MPAs) to identify strategic priorities including any relevant cross-boundary issues and to develop strategic policies to address them. Such policies should set out an overall strategy for the pattern, scale and quality of development and make sufficient provision for strategic matters which includes the supply of minerals. The policies should also provide a clear strategy for bringing sufficient land forward, and at a sufficient rate, to address objectively assessed needs over the plan period, in line with the presumption in favour of sustainable development.

[3] EMAWP Annual Report 2010

[4] National Planning Policy Framework, July 2021 Paragraph 21

2.2 The NPPF[5] recognises that it is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. It also recognises that since minerals are a finite resource, and can only be worked where they are found, it is important to make best use of them to secure their long-term conservation. The NPPF requires that local plan policies provide for the extraction of mineral resources of national and local importance including cement-making materials.

2.3 National planning policy[6] requires that MPAs plan for a steady and adequate supply of industrial minerals by:

a) co-operating with neighbouring and more distant authorities to ensure an adequate provision of industrial minerals to support their likely use in the industrial and manufacturing processes;
b) encouraging safeguarding or stockpiling so that important minerals remain available for future use;
c) maintaining a stock of permitted reserves to support the level of actual and proposed investment required for new or existing plant and the maintenance and improvement of existing plant and equipment[7] .

Duty to Co-operate

2.4 Local planning authorities and county councils (in two tiers areas) are under a duty to co-operate with each other and with other prescribed bodies on strategic matters which cross administrative boundaries. Joint working is particularly important in identifying whether development needs that cannot be met within a particular plan area could be met elsewhere.

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[5] National Planning Policy Framework, July 2021 Paragraph 209

[6] National Planning Policy Framework, July 2021 Paragraph 214

[7] These reserves should be at least 15 years for cement primary (chalk and limestone) and secondary (clay and shale) to maintain an existing plant and at least 25 years for cement (primary and secondary) to support a new kiln.

2.5 Strategic policy making authorities should collaborate to establish cross border matters which they need to address in their plans and in accordance with the new NPPF produce one or more statements of common ground. These should document the cross-boundary matters being addressed and progress in co-operating to address these.

Planning Practice Guidance

2.6 Planning Practice Guidance (PPG)[8] sets out that the local plan should make it clear what is intended to happen in the area over the life of the plan, where and when this will occur and how it will be delivered. It adds that this can be done by setting out broad locations and specific allocations of land for different purposes, through designations where particular considerations apply and through criteria-based policies to be taken into account when considering development.

2.7 PPG sets out guidance[9] on how MPAs should plan for the steady and adequate supply of minerals in one or more of the following ways (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.

[8] PPG, Paragraph: 002 Reference ID: 12-002-20140306

[9] PPG, Paragraph: 008 Reference ID: 27-008-20140306

2.8 PPG[10] provides specific 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.

2.9 PPG[11] also sets out advice on the best way of providing for sufficient stocks of permitted reserves at individual sites. It advises that stocks of permitted reserves should be used as an indicator to assess whether further permitted reserves are required at an industrial minerals site. Stocks of permitted reserves should be calculated when a planning application is submitted to extract the mineral (through either a site extension or a new site) or when capital investment is proposed e.g. for a new kiln. The overall amount required should be directly linked to the scale of capital investment to construct and operate the required facility. For cement making, the stock of reserves should be at least 15 years for primary minerals (chalk and limestone) and secondary (clay and shale) to maintain an existing plant and at least 25 years (primary and secondary) to support a new kiln.

Adopted saved local planning policy

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[10] PPG, Paragraph: 086 Reference ID: 27-086-20140306

[11] PPG, Paragraph: 088 Reference ID: 27-088-20140306

2.10 The adopted Derby and Derbyshire Minerals Local Plan contains a saved[12] policy (MP25) to allow for the extraction of industrial minerals. Notwithstanding that the Plan was adopted in 2002, the policy is broadly in accordance with the NPPF policies for planning for industrial minerals.

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.[13] 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

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[12] Under Paragraph 1(3) of Schedule 8 to the Planning and Compulsory Purchase Act 2004

[13] BGS & ODPM, Industrial Minerals:Issues for Planning, 2004,p12

appropriate form of transportation to be used.[14] 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, at some sites, 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 Limestone and Cretaceous-age Chalk are the main important resources of industrial limestone in England.[15]

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.

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[14] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p174
[15] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p7

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[16].

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 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.[17]

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.[18]

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

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

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

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.[19]

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 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.[20] A separate Background 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

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

outcrop (the Cadeby Formation) occurs in the north-east of the county, to the east of Bolsover.[21]

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.[22] The only other source of material of a similar quality is found at Thrislington Quarry in County Durham.

Relationship with aggregate limestone

4.11 In the excavation of high-grade industrial limestone, rock of all grades will necessarily be produced[23] 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

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[21] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p8
[22] BGS & DoE, Mineral Resource Information for Development Plans, 1995; p9
[23] BGS & ODPM, Industrial minerals:Issues for Planning, Annex B, p100, 2004

4.12 Since minerals are a finite resource it is important to ensure that non-mineral 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. A separate Background Paper has been produced on the Safeguarding of Mineral Resources.

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, 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 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. Need

6.1 There is no national assessment of need 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%[24] is not sold on the open market but used captively 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. Flue gas

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

desulphurisation has emerged as a major market for industrial limestone since 1994, however this market is tied to the future of coal-fired power generation in the UK which is set to cease by 2024.[25] Industrial lime makes an important contribution to the UK trade balance with 25% of total industrial lime sales exported in 2019.[26]

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. [27]

Economic importance

6.5 In 2018, a total of 400 million tonnes of aggregates, industrial minerals and other manufactured mineral products were produced in Great Britain. This is over four times the total volume of energy minerals, produced in the UK. The minerals products industry[28] directly contributed over £5.8 bn in 2018 to the UK economy. However, the importance of construction and industrial minerals as

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[25] UK Minerals Forum, Trends in UK Production of Minerals, 2014
[26] MPA Profile of the UK Minerals Products Industry 2020

[27] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p174
[28] Defined as the extraction of mineral resources and their processing and manufacture into asphalt, cement, concrete, industrial and agricultural lime, mortar and slag and including some road freight activities.

essential inputs to downstream industries, mainly within the manufacturing and construction sectors, also needs to be recognised. The Mineral Products Association estimates that the mineral products industry had a turnover of £16.3bn in 2018 and enabled a further £596.7bn turnover in industries downstream of the supply chain[29]. International trade in minerals and mineral products is limited with, for instance, domestic sources supplying about 85% of the cement market. One exception is industrial lime, for which approximately 25% of total UK production was exported in 2019. A proportion of UK marine sand and gravel, dimension stone and industrial clay production is also exported.

6.6 In 2018, the minerals products industry directly employed 81,000 people and supported 3.5 million jobs through its supply chain; the industry is also highly productive; each worker produced over £71,000 in gross value added in 2018, equivalent to 1.2 times the national average[30]. Whilst there are no separate figures available for employment in the mining and quarrying industry for the Plan area it is known to be insignificant in Derby City and has declined considerably in Derbyshire following the demise of the coal industry. Nevertheless, nationally Derbyshire remains an important leader in the supply of aggregate and industrial minerals and employs an above average number of employees in this sector. From the information available , a study[31] undertaken in 2017 estimated that in High Peak and Derbyshire Dales, (where most of the limestone quarries are located), there were 925 (full time equivalent (FTE) jobs) in the mining and quarrying sector, accounting for 82% of Derbyshire's workforce in that sector and 5.4% of national jobs in that sector. The study further estimated that the sector supports an additional 1,437 FTE jobs across those two district council areas. These districts are predominantly rural areas where employment opportunities can be scarce.

[29] All figures taken from MPA Profile of the UK Minerals Products Industry 2020

[30] MPA Profile of the UK Minerals Products Industry 2020

[31] Minerals Extraction in High Peak and Derbyshire Dales: A Sector Benefits Study 2017

7. Supply

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.[32]

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.[33]

7.3 The annual production of industrial limestone from the Plan area has remained fairly steady at around 3 million tonnes over the last 10 years[34]; and in line with the national trend demand[35] is not expected to increase significantly over the plan period. At the end of 2018 the Plan area had an estimated total reserve of some 178[36] million tonnes (operational and non-operational sites) of industrial limestone, equivalent to over 59 years of production at estimated annual rates.

Industrial limestone quarries in the Plan area

Operational sites

7.4 In 2019, a total of nine quarries produced industrial limestone within the Plan area. Further details are set out in Figure 3 below and their location is shown on Figure 5. Most of these quarries also produce limestone for aggregate use and in some cases industrial limestone production is quite low, which has been indicated in the table.

[32] BGS, United Kingdom Minerals Yearbook, 2015
[33] BGS & ODPM, Industrial Minerals: Issues for Planning, 2004; p173
[34] Annual Mineral Surveys Derbyshire (2009-2019)
[35] UK Minerals Forum:Trends in UK Production of Minerals Jan 2014 – 7.8 Industrial Carbonates
[36] Annual Mineral Surveys Derbyshire (2009-2019)

Figure 3 Operational Industrial Limestone Quarries, 2018[37]

Quarry	Operator	Industrial mineral / product produced
Bone Mill Quarry (Ryder Point), 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
Dene Quarry, Cromford (less than 10% industrial)	Tarmac	Agricultural Lime
Dove Holes Quarry, Buxton (less than 10% industrial)	CEMEX UK Ltd	Agricultural Lime
Dowlow Quarry, Buxton	Breedon Southern Ltd	Industrial Carbonate Agricultural Lime
Grange Mill Quarry, Wirksworth	Ben Bennet Jnr Ltd	Agricultural Lime Industrial Carbonate
Tunstead Quarry (Tunstead - Old Moor), Buxton	Tarmac	Lime Cement Manufacture Industrial Carbonate
Whitwell Quarry, Whitwell	Tarmac	Dolime Industrial Dolomite

Brassington Moor Quarry

7.5 One quarry, Brassington Moor, is anticipated to run out of permitted reserves of industrial limestone before the end of the Plan period. The quarry operator is promoting an extension to this site (known as Aldwark South), shown on Figure 4 below, which raises a 'duty to co-operate' issue in terms of its potential to impact on the Peak District National Park.

7.6 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. Production rates have increased

[37] BGS, Directory of Mines and Quarries, 2014 (updated to 2018)

in recent years averaging above 1mt with approximately 70% used for industrial purposes and 30% used for aggregates.

7.7 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. The promoted extension to the quarry would yield approximately 38 mt of reserve generating between 6.8 and 12.2 mt of low cadmium reserves.

Non-operational industrial limestone quarries

7.8 In addition, a further four quarries have reserves of industrial limestone, and would not require a new planning permission to resume extraction but are not currently in production.

- Hillhead Quarry, Buxton (Tarmac) - Working is temporarily suspended as the operator has sufficient reserves at other sites but is likely to commence in the near future.
- Hindlow Quarry, Buxton (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 near future.
- Middle Peak , Wirksworth (Tarmac) – No production since 2005.
- Middleton Mine, Wirksworth (Tarmac) – No production since 2005.

7.9 The MPA will liaise with the relevant operators to establish the contribution that individual quarries (particularly non-operational sites) are likely to make to the supply of industrial limestone over the Plan period.

Figure 4: Proposed allocated extension to Aldwark/Brassington Moor Quarry – Aldwark South

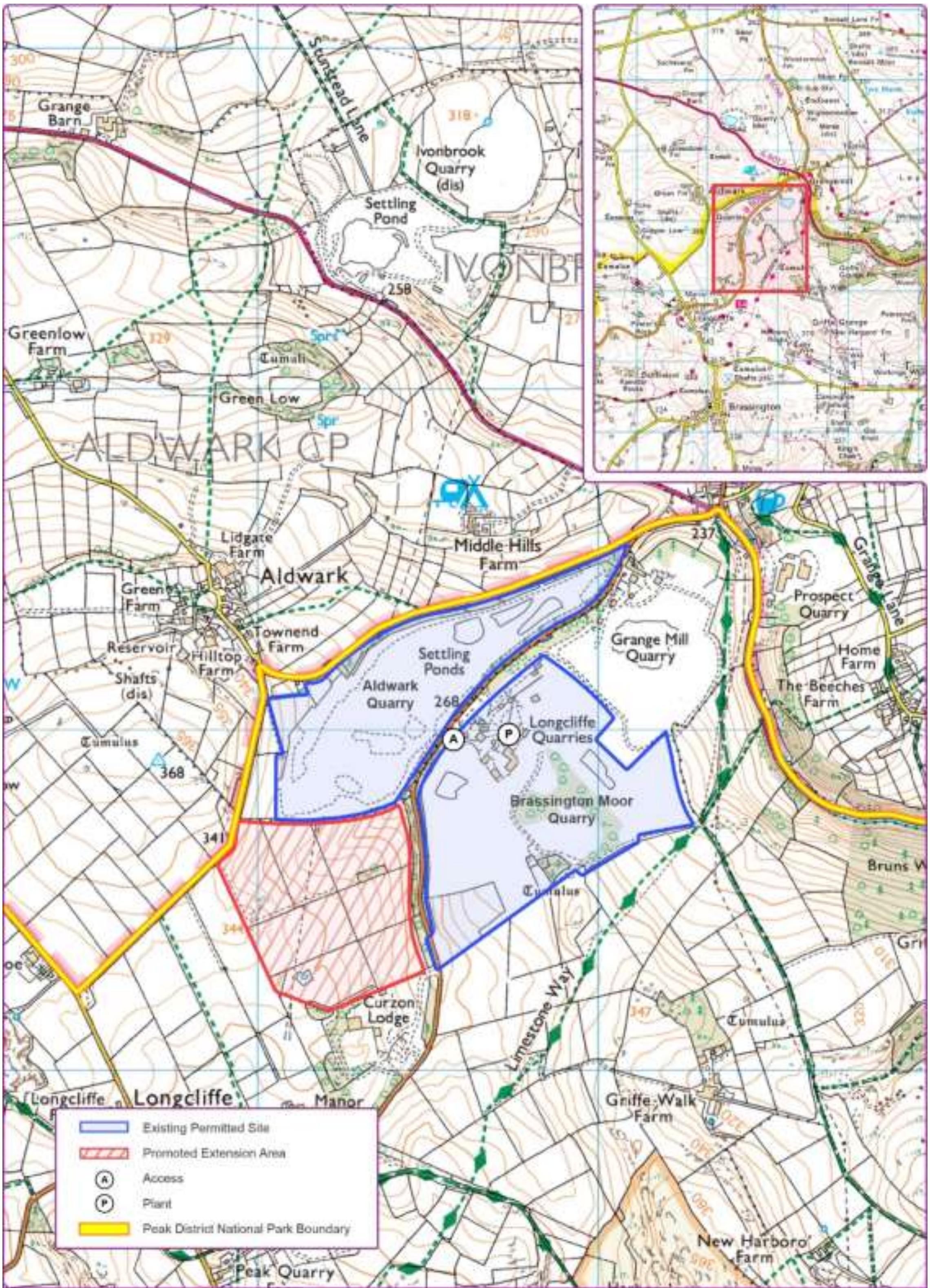

Figure 5: Operational and Non-operational industrial limestone quarries within the Plan area – 2018

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 The processing of industrial minerals requires both significant capital investment in plant and machinery and high ongoing maintenance costs. The Plan needs to make provision for the maintenance of stocks of permitted reserves to support investment required for new or existing plant and to maintain and improve existing plant and equipment.

8.4 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 objective of making the most sustainable and efficient use of mineral resources.