

Derbyshire and Derby Minerals Local Plan

Background Paper: Sand and Gravel

February 2023



Derby City Council



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1. Introduction and Background

- 1.1 Sand and gravel deposits are accumulations of rock fragments and mineral grains, which have been derived from the weathering and erosion of hard rocks by glacial and river action. Sand and gravel was the principal source of primary aggregate until 1979 when crushed rock output exceeded it for the first time. By 2019, it accounted for just 19% of total UK aggregate supply.¹
- 1.2 Between 2021 and 2038, it is estimated through the Local Aggregate Assessment (LAA) 2022 (2021 data) that Derbyshire and Derby will have to provide around 15.81 million tonnes of sand and gravel in order to meet the level of demand based on the latest national demand forecast. Taking account of permitted reserves at the end of 2019 9.43 million tonnes, the resulting shortfall that the Plan will have to meet is around 6.38 million tonnes. There is also the requirement to maintain a landbank of at least 7 years for sand and gravel.

¹ Mineral Products Association, Profile of the UK Mineral Products Industry, 2020

2. National Planning Policy and Guidance

- 2.1 The National Planning Policy Framework (NPPF) 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 recognises also that minerals are a finite resource, so it is important to make best use of them in order to secure their long-term conservation.
- 2.2 It sets out the need to plan for a steady and adequate supply of aggregate by preparing a LAA to forecast future demand based on a rolling average of 10 years' sales data and other relevant information and an assessment of all supply options. A landbank of at least seven years should be maintained for sand and gravel. It also states that planning policies should ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality. Planning policies should also ensure that worked land is reclaimed at the earliest opportunity, and that high-quality restoration and aftercare of mineral sites takes place. It also sets out the Government's aim to take account of the contribution that recycled and secondary aggregates make to minerals supply before considering extraction of primary materials.
- 2.3 Planning Practice Guidance (PPG) sets out that the Managed Aggregate Supply System (MASS) seeks to ensure a steady and adequate supply of aggregate mineral, to handle the significant geographical imbalances in the occurrence of suitable natural aggregate resources, and the areas where they are most needed. It requires mineral planning authorities which have adequate resources of aggregates to make an appropriate contribution to national as well as local supply, while making due allowance for the need to control any environmental damage to an acceptable level.
- 2.4 It sets out that a LAA should include a forecast of the demand for aggregates based on both the rolling average of 10-years sales data and other relevant local information and an analysis of all aggregate supply options. It should also look at average sales over the last three years to identify the general trend of demand as part of the consideration as to whether it might be appropriate to increase supply.

- 2.5 It also sets out that aggregate landbanks should be used as a trigger for a mineral planning authority to review the current provision of aggregates in its area and consider whether to conduct a review of the allocation of sites in the Plan.
- 2.6 It also states that the suitability of each proposed site, whether an extension to an existing site or a new site, should be considered on its individual merits, taking into account issues such as:
- the need for the specific mineral
 - economic considerations (such being able to continue to extract the resource, retaining jobs, being able to utilise existing plant and other infrastructure), and
 - positive and negative environmental impacts (including the feasibility of a strategic approach to restoration).
 - the cumulative impact of proposals in an area.

3. Derbyshire and Derby's Sand and Gravel Resources

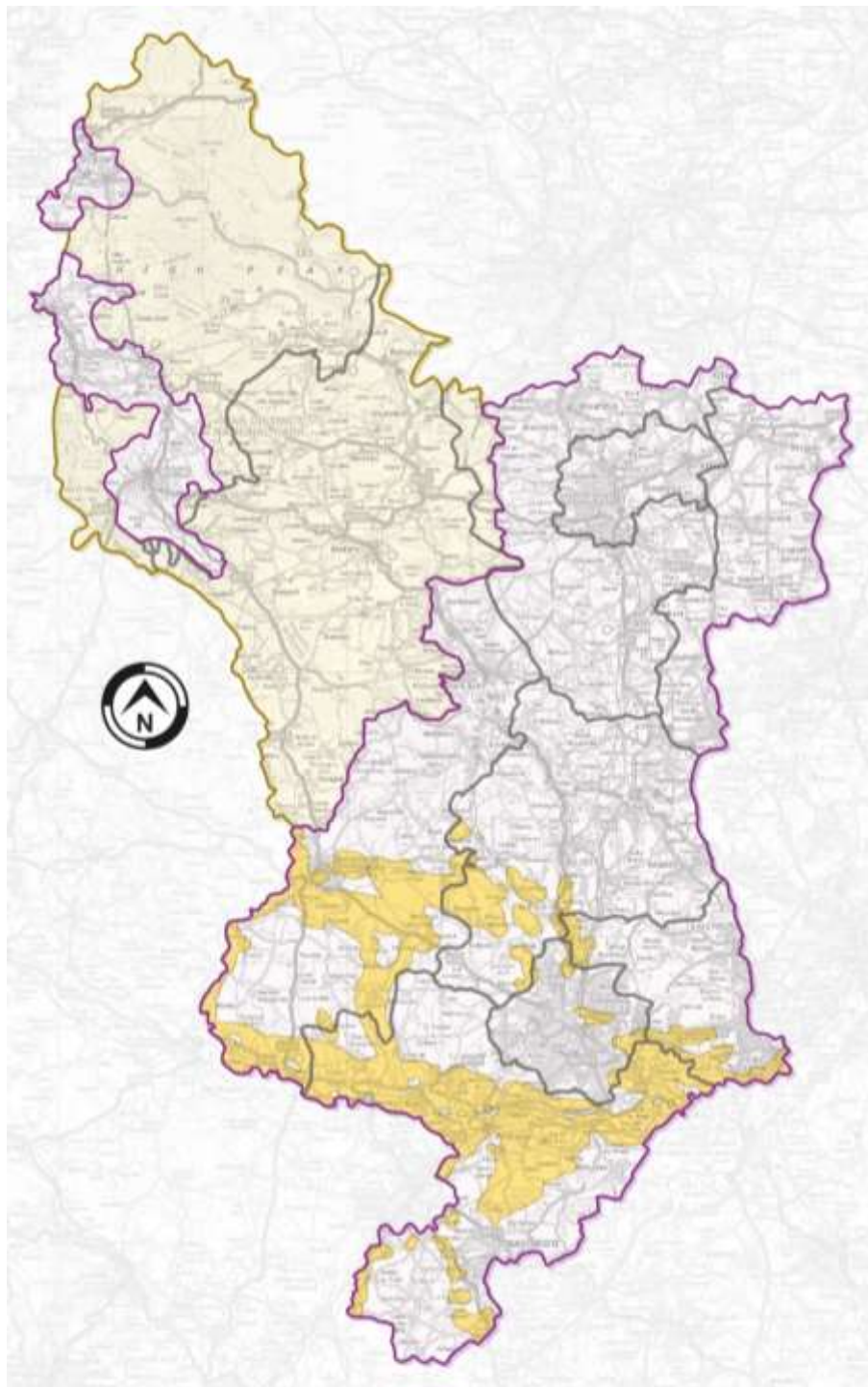
- 3.1 Derbyshire and Derby have substantial resources of sand and gravel in the river valleys of the Trent, Lower Derwent and the Lower Dove, occurring within the fluvial/alluvial and terrace deposits, as shown on Map 1 below. The formation of these drift deposits took place following the last ice age when considerable amounts of sand, gravel, silt and clay, in the form of glacial and weathered rock deposits, were eroded by glacial melt waters and deposited in wide tracts in the areas alongside these rivers. The thickness of the river valley deposits varies considerably, ranging from less than one metre thickness in some areas to as much as eight or nine metres thick in other areas. The gravel content of the deposits is usually high (50%-70%), the remainder being sand and fine silts². There has been little mineral working in the Lower Dove Valley, with most to date having taken place in the Trent and the Lower Derwent Valleys, reserves being of particularly high quality, both in geological and commercial terms, in the area of the Trent Valley between Long Eaton and Willington and on into Staffordshire.
- 3.2 Deposits of sand and gravel also occur in the solid bedrock of the Sherwood Sandstones. These are much older than the river valley deposits, having been laid down around 230 million years ago in the Triassic geological period. Their thickness varies considerably from 100m to virtually nothing. The proportion of gravel also varies greatly but is usually much less than in the river valley deposits. It is an important source of soft building sand and there is currently only one operation in the county. This is located at Mercaston in an area between Derby and Ashbourne. The operator of this quarry has indicated that it has sufficient reserves to last this Plan period and has, therefore, not put forward any proposals for extensions to this quarry.
- 3.3 Mineral resource information for the Plan area was compiled by the British Geological Survey in 1995³. Resource information for sand and gravel in the Plan area has been defined from available geological information. Parts of the sand and gravel resource in the Plan area have, however, been evaluated by mineral companies and, therefore,

² Minerals Local Plan, Derbyshire County Council 2000

³ British Geological Survey, Mineral Resource Information for Development Plans, Derbyshire: Resources and Constraints, 1995

knowledge of the economic potential of the resource has been established with a high level of confidence. In practice, mineral planning authorities are largely reliant on the mineral companies to supply detailed authoritative information on the quality and quantity of the resource.

Sand and Gravel Safeguarding Area



-  Plan Area
-  Peak District National Park Area
-  Sand and Gravel Safeguarding Area with Buffer

Note: Excludes buffer zones which are shown on the policies map

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4. The Current Supply Situation

- 4.1 Information regarding mineral production and reserves is collected annually through the Aggregates Survey organised by the Aggregates Working Party. Whilst information collected through this survey can often vary significantly from year to year, particularly regarding reserves, it is the best information available and we have to assume its reliability upon which to base the assumptions set out in the Minerals Local Plan.
- 4.2 Although there are limited resources of sand and gravel in Derby City, these are not currently worked and have not been for some time.
- 4.3 As Table 1 below shows, production of sand and gravel in Derbyshire between 2012 and 2021 has averaged 0.93 million tonnes.

Table 1: Annual Production of Sand and Gravel in Derbyshire 2012-2021 (figures in million tonnes)

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	AV
0.81	0.82	0.95	1.13	1.29	0.94	1.05	0.78	0.57	0.99	0.93

- 4.4 The following Table shows how this material was used in 2021.

Table 2: Use of Sand and Gravel (figures in tonnes)

Building Sand	Sand for Concrete making	Gravel for Concrete making	Other screened and graded	Other uses for sand and gravel
6121	248,489	312,130	139,107	290,764

- 4.5 At the end of 2021, Swarkestone, Shardlow, Willington and Mercaston were the active sand and gravel quarries. At this time, permitted reserves of sand and gravel in Derbyshire totalled around 9.43mt.
- 4.6 This stock of reserves with planning permission is known as the landbank. The term permitted reserve includes current non-working sites but excludes those sites where mineral working cannot take place until there has been a review of the planning conditions attached to their planning permission. Government guidance requires landbanks to be maintained for all aggregate minerals, with the recommended landbank

period for sand and gravel being at least 7 years. The current length of the landbank for sand and gravel in the Plan area is calculated as follows:

Landbank of permissions	= 9.43 million tonnes
Annual Provision Rate (see section 5 below)	= 0.93 million tonnes
Landbank period (landbank ÷ annual provision rate)	= 10.14 years

Dormant Sites

4.7 There has been no working at Egginton Quarry for a number of years now and it is now classified as being dormant i.e., a new set of conditions would have to be approved before it could be worked again. Mugginton Quarry in the Sherwood Sandstones is also classified as being dormant. Reserves at these quarries are estimated to be 2.1 million tonnes and 0.6 million tonnes respectively. The reserves at these quarries are not included in the landbank above because they no longer have valid planning permissions.

Table 3: Sand and Gravel Provision – Reserves and Requirements

Sand and Gravel	Million Tonnes
Requirement	
Production Requirement 2022-2038	15.81
Reserves	
Permitted Reserves (Landbank) at 31/12/2021	9.43 ⁴
Shortfall	
Shortfall 2022 – 2038	6.38

⁴ EMAWP Survey 2021 figures, excluding 2.7mt on “dormant” sites

5. Future Provision

- 5.1 Mineral planning authorities (MPAs), such as Derbyshire County Council and Derby City Council, are required to determine the level of sand and gravel that they should provide in order to maintain a steady and adequate supply, taking account of previous sales, published national and sub national guidelines and other relevant information and set these out in a Local Aggregate Assessment. The levels set should of course be reasonable and realistic and should be set within the context of the national requirement for minerals. The MPAs have considered all information and have determined that the most recent ten-year average of production should currently be used to determine future provision of sand and gravel.
- 5.2 The Local Aggregate Assessment indicates, therefore, that, based on an annual provision rate of 0.93mt, Derbyshire and Derby will provide 15.81 million tonnes of sand and gravel from 2022 to 2038. There are already permitted reserves of 9.43 million tonnes, which means that additional provision will have to be made in the Minerals Local Plan for around 6.4 million tonnes of sand and gravel to 2038.

6. Allocating Sites in the Plan

- 6.1 Extensions to existing sites can offer benefits, mainly in terms of reduced environmental disturbance, especially where access, infrastructure and mitigation measures are already in place, but the disadvantage is the potential cumulative impact that continued extraction could have on an area if successive extensions are permitted. New sites can relieve the cumulative impact from other areas but then bring the impacts of mineral extraction to an area previously unaffected.
- 6.2 Currently, all active sand and gravel workings in Derbyshire are located in the Trent and Derwent Valleys in an area stretching from Shardlow in the east of the valley to Willington further west. There is further potential in this area, at least in the short to medium term, for new permissions to take the form of extensions to existing sites rather than wholly new sites. Resources are, however, gradually becoming depleted in this area and at some point, in order to maintain production, sites will have to be located in areas which have so far been largely unaffected by mineral extraction. The area of the Lower Dove Valley around Foston and Sudbury is the main area with potential for sand and gravel working, although much of this has yet to be explored in terms of its mineral deposits.
- 6.3 The Councils have asked mineral operators to put forward sites they wished to be considered for extraction. Eight sites have been put forward and considered for consideration for sand and gravel extraction; three of these are extensions to existing sites and five are new sites. These sites have the potential capacity to provide a total of around 26 million tonnes of sand and gravel. All these sites have been assessed against the same criteria, which have been developed in collaboration with relevant stakeholders and local communities, to determine their potential for future sand and gravel working. Elvaston, Sudbury, Foston, Swarkestone North and Swarkestone South have been selected as the sites which have the greatest potential to be allocated for sand and gravel extraction in the Minerals Local plan.

Table 4: Sites Suggested for Sand and Gravel Extraction

Site name	New site/ extension	Reserves (Million tonnes)	Estimated output per annum	Estimated life of site (years)
Trent Valley - East				
Elvaston	Extension	1.5	250,000	6
Foremark	New	5	500,000	10
Trent Valley - West				
Swarkestone North	Extension	4.25	300,000	14
Swarkestone South	Extension	2.5	300,000	8
Twyford	New	6.25	350,000	18
Dove Valley				
Egginton	New	1.8	300,000	6
Foston	New	3.1	450,000	7
Sudbury	New	2.0	250,000	8

7. Method of Working and Restoration

- 7.1 There are three stages involved in the production of sand and gravel; extraction, processing and restoration. Extraction initially involves the stripping of topsoil, subsoil and overburden. These materials are used either in progressive restoration or stored and used at a later stage in the restoration programme. Extraction of the mineral is usually carried out in a de-watered working area by excavator. The excavated material is then either loaded into dump trucks for transportation to the processing plant or loaded into a hopper, which feeds a conveyor. At the plant, a series of crushing and screening operations grade and sort the minerals into the different sizes of sand and gravel required by the construction industry. The processed material is stored in stockpiles according to size before being transported to the customer or used on site in the manufacture of concrete. The plant and stockpile areas can be visually intrusive in the often open valley landscapes. Although the shallow nature of sand and gravel extraction results in high lateral land take, it also enables restoration to be undertaken to a high standard. The lack of waste produced on site does mean the requirement for importation of fill material in many cases to restore land to original levels. Alternatively, areas extracted below the water table will return naturally to the water level, presenting opportunities for water-based after-uses.
- 7.2 Although most of the permitted sand and gravel workings in the Plan area have conditions requiring their restoration to agriculture, restoration to water and other wildlife and leisure uses is becoming more common as inert fill material becomes increasingly scarce. This is partly because there are now far fewer coal-fired power stations, with the resultant decline in their by-product of pulverised fuel ash. Also, construction and demolition wastes are now increasingly being recycled rather than being used as fill material in restoration schemes.
- 7.3 Former sand and gravel workings can be restored to a variety of end uses. Sites can be restored to agricultural uses where sufficient infill material is available. Many restored sites provide valuable areas for nature conservation, providing important opportunities to increase biodiversity (for example reed beds, wet grasslands, wet woodlands, ponds). They also provide opportunities for formal recreation (sailing, fishing, bird watching) and informal recreation (walking, cycling and picnicking). The majority of former sand and gravel workings are restored to a mixture of all these uses. The proportion of each use is dictated to a

large extent by the proximity to airports and the amount of infill material that is available. Restoration to agriculture is a priority on sites close to airports; birdstrike is an issue where such sites are restored to water. We work closely with airport authorities in ensuring that sites close to airports are restored in such a way to minimise the risk of birdstrike.

8. Transportation

- 8.1 All sand and gravel extracted from the Plan area is transported to its markets by road⁵. Viable alternatives are not currently available but will be explored where possibilities arise.

9. Markets

- 9.1 Sand and gravel is used primarily in the manufacture of ready mixed concrete, pre-cast concrete products and as bulk filling material. As previously shown in Table 2, a high percentage of Derbyshire's sand and gravel is used in the manufacture of concrete. Some of the active sand and gravel quarries in Derbyshire have ready mixed concrete plants on site, producing concrete for the pre-cast concrete plants within the county. These serve a national and regional market for products such as blocks, floors, pipes, kerbs and street furniture. Sand is used mainly in the production of mortars and asphalt.
- 9.2 Most sand and gravel originating from Derbyshire is used within 10-15 miles of the quarries, mainly because of the high cost of transporting the material, but also because of competition from other sources of aggregates in the area. In 2019, 57% of the total sand and gravel output from Derbyshire was sold to markets within the Plan area, with 22% being exported to other counties within the East Midlands Region and the majority of the remaining 21% being used within the West Midlands Region.⁶ In 2019, Derbyshire and Derby imported around 521,000 tonnes of sand and gravel from other areas (mainly from Lincolnshire).

⁶ EMAWP 2020 Annual Report

10. Contribution to the Economy

10.1 The extraction of sand and gravel provides benefit to the economy in terms of the supply of the material from the region and the direct employment at the quarry, as well as indirect employment mainly through the use of haulage contractors. In 2019, the sand and gravel industry provided employment for 84 people in Derbyshire and Derby and the Peak District National Park. This included 26 in direct employment, 56 lorry drivers and 2 contractors⁷.

⁷ Annual Mineral Raised Inquiry 2018, DCLG February 2018