

# Construction and industrial minerals, Grampian Highlands

From Earthwise

[Jump to navigation](#) [Jump to search](#)

Stephenson, D, and Gould, D. 1995. British regional geology: the Grampian Highlands. Fourth edition. Reprint 2007. Keyworth, Nottingham: British Geological Survey.

□

## Contents

- [1 Brick clay](#)
- [2 Building stone](#)
- [3 Crushed rock aggregate](#)
- [4 Diatomite](#)
- [5 Fireclay](#)
- [6 Limestone and dolomite](#)
- [7 Peat](#)
- [8 Sand and gravel](#)
- [9 Serpentine](#)
- [10 Silica rock and silica sand](#)
- [11 Slate](#)
- [12 Talc](#)
- [13 Full list of references](#)

## Brick clay

Superficial deposits have been worked for making bricks, tiles and pipes in widespread areas of coastal Aberdeenshire, Banffshire and Morayshire. The raw materials used include boulder clay, glaciolacustrine deposits, raised marine deposits and alluvium, but a combination of relatively high costs of firing, rationalisation of the industry and remoteness from major markets in central Scotland have resulted in the closure of all the brickworks in the Grampian region.

## Building stone

The demand for dimension stone for building virtually disappeared in the 1950s, but a general dissatisfaction with the aesthetics and lasting qualities of concrete, together with reawakening of architects to the visual appeal of natural stone, has led to an upsurge in the demand for granite and sandstone blocks. Until recently the main requirement has been for facing or cladding and for selected replacement of stone in restoration projects, but a market has re-emerged for load-bearing cube stone.

Good-quality freestone is worked from quarries in the Permian sandstone near Elgin. In Aberdeenshire, the Caledonian granites were the best and most highly exploited building stones but extraction of cube stone is very small and the Aberdeen stone-polishing industry now (1993) uses mainly imported materials.

## Crushed rock aggregate



Kemnay Quarry, Aberdeenshire. The Kemnay granite is worked for aggregate, dimension stone and cladding. In the background is the granite mass of Bennachie (D 4337). P000206.

The overriding property determining the suitability of a rock for making aggregate is its crushing strength, which is mostly governed by the nature of the rock, but can be affected quite significantly by the state of weathering and alteration. The mechanical properties, other than crushing strength, that are critical in more specific applications are resistance to polishing and wear, which governs the suitability of rock chippings for road surfacing, and drying shrinkage, which governs the versatility of aggregate for concreting purposes.

The Grampian Highlands are well endowed with resources of rock suitable for producing aggregate (Smith, 1989a). Granites are potentially suitable for most road-making and concreting applications and some of those occurring along the western seaboard have good export potential. Quarries are concentrated in the Aberdeen area where the granites are crushed to produce aggregate and reconstituted 'Fyfestone' (P000206). Gabbro is worked for aggregate at Balmedie and Pitcaple to the north of Aberdeen. Most other quarries in the Grampians exploit Dalradian psammites.

## Diatomite

Small deposits of diatomite occur at sites formerly occupied by lochs, but the only major potential source is the Muir of Dinnet, between Ballater and Aboyne in Aberdeenshire, where the diatomite was recognised in 1882 and was exploited spasmodically on a small scale until 1918 (Gould, 1997). The fine-grained nature of diatomite, together with the open structure and shape of the diatom frustules, renders it a useful filtering medium, which is its main commercial use.

## Fireclay

A reddish lateritic clay occurs at the base of the Coal Measures in the Carboniferous of the Machrihanish coalfield. Although sometimes referred to as a bauxitic clay, it contains an excess of silica and is not truly bauxitic. Although the deposit is a potential resource of high-alumina fireclay,

it is unlikely to be extracted in the foreseeable future because present production fully satisfies, and at times exceeds, demand and there are more readily accessible deposits in the Midland Valley, closer to markets for the material.

## **Limestone and dolomite**

The Dalradian Supergroup contains four major developments of metamorphosed carbonate rock, some of which extend over strike-lengths of about 100 km and are up to several tens of metres thick. They show considerable variation in outcrop dimension, purity and dolomite content. The Blair Atholl Subgroup limestones are, on average, more pure than the other Dalradian carbonate formations.

Limestone is currently produced at five quarries, mostly for agricultural use but also, to a limited extent, for concrete aggregate (Grout and Smith, 1989a). Limestones of the Ballachulish Subgroup are worked at Parkmore, Dufftown and at Torlundy, to the north of Fort William. A thick limestone in the Blair Atholl Subgroup is worked at Shierglas Quarry near Blair Atholl and the Boyne Castle Limestone of the Tayvallich Subgroup is worked on the coast between Banff and Portsoy. The Loch Tay Limestone is exploited at Calliburn, near Campbeltown.

Dolomitic limestone, with potential uses in the manufacture of rock wool, was formerly worked in the Appin Phyllite and Limestone Formation at Durar, Appin, but extraction ceased because of variation in quality. Dolomitic limestone also occurs at this stratigraphical level elsewhere in the Grampian Highlands.

## **Peat**

Deposits of peat are both widespread and abundant throughout the region, especially the 'hill peat' type on the higher uplands, although there are also considerable areas of 'basin peat' on the plateau districts of Aberdeenshire.

Utilisation of the peat as fuel, generally by individual users, has not been important in the present century, but persists on a small scale in some areas and has a specialised application in the distillation of whisky. Commercial production of peat for fuel and horticultural usage has been undertaken in northern Aberdeenshire and at Moy, south-east of Inverness, but this kind of exploitation is generally limited by the inaccessibility of large-scale deposits that would respond to mechanical extraction, by the costs of transportation and by concerns regarding conservation of the environment.

## **Sand and gravel**

Haulage costs make up a substantial proportion of the delivered price of sand and gravel. Consequently, despite rationalisation of the industry, sand and gravel is still exploited from many localities scattered widely across the area. It is mainly derived from 'dry' workings in Quaternary glaciofluvial, alluvial, beach and sand dune deposits for use in the manufacture of concrete and concrete products. It is traditionally preferred to crushed rock aggregate because of its lower cost and better workability. More than half of the sand and gravel production is used in the manufacture of concrete. About 26 per cent of production is used in road sub-bases and embankments, a further 11 per cent is used as 'mortaring' and 'sharp' sand in the building industry, and fine-grained sand for mixing with bitumen to make asphalt accounts for another 11 per cent or so of production (BGS, 1991).

The aggregates industry is very important to the local economy, but extraction of sand and gravel, in

particular, is placing increasing pressure on planning authorities to balance necessary mineral exploitation with competing uses of land and with conservation of the environment (Merritt, 1992). Descriptive accounts of sand and gravel resources of the whole of the Grampian Highlands are contained in the Institute of Geological Sciences Reports 77/2, 77/6, 77/8, 77/9 and 78/8. In addition more detailed assessments of the sand and gravel resources for the area between Peterhead and Stonehaven are available in BGS Mineral Assessment Reports 58, 76, 146, 148 and 149 and for part of Lower Speyside (Report 41).

## **Serpentine**

Serpentinite intrusions occur in association with the Dalradian succession in Banffshire, Aberdeenshire, Angus and Perthshire, and in the Cambro-Ordovician Highland Border Complex. Besides its traditional use as an ornamental stone, for which it was worked in the past, notably at Portsoy, this rock has some potential as a source material for refractory brick manufacture, but much of the Highland Border material is carbonated or otherwise impure.

## **Silica rock and silica sand**

Some of the most pure Dalradian quartzites were thought to have potential for silica-brick manufacture in lump form, but only the Binnein Quartzite of the Loch Leven–Glencoe area has proved to be of sufficient purity (Smith, 1989b). The Appin Quartzite near Kentallen was formerly quarried for use in grinding-tubs in the pottery industry. Quartz veins occur in many parts of the Grampian Highlands, but are generally thin and impersistent. A thick vein of high-purity quartz occurs near Dalwhinnie and may have potential for use in the preparation of a decorative aggregate.

A siliceous sandstone of considerable purity, belonging to the Limestone Coal Formation, occurs in the Machrihanish Coalfield, where it was mined, mainly as a source of moulding sand.

## **Slate**

Reserves of slate are abundant in the North-east and South-west Grampian Highlands and along the Highland Border, but workings have been discontinued as a result of competition from Welsh slates, which are of superior quality, and from cheaper manufactured roofing materials.

## **Talc**

Steatite (massive, fine-grained talc), soapstone and potstone (impure talcose rock), are normally found as alteration products of serpentinised ultramafic igneous rocks that have been subjected to intense shearing or deformation. The main resources to have been exploited have been in crush zones of the Portsoy Serpentinite but small quantities have been recovered from numerous serpentinite bodies occurring between Portsoy and Blairgowrie. Talc is generally located along shear planes in these bodies, whereas part of a small intrusion at Corrycharmaig, near Killin has been altered to an aggregate of talc and breunnerite. In the Inellan and Toward areas of Argyllshire, on the western shore of the Firth of Clyde, lenticular veins of talc are present in a belt of serpentinite lying between two faults in the Highland Boundary Fault Zone. Overall, the resources of talc in the Grampian Highlands are small, scattered and restricted to relatively low-value industrial grades (Grout and Smith, 1989b).

## **Full list of references**

Retrieved from

'[http://earthwise.bgs.ac.uk/index.php?title=Construction\\_and\\_industrial\\_minerals,\\_Grampian\\_Highlands&oldid=34519](http://earthwise.bgs.ac.uk/index.php?title=Construction_and_industrial_minerals,_Grampian_Highlands&oldid=34519)'

Category:

- [Grampian Highlands](#)

## **Navigation menu**

### **Personal tools**

- Not logged in
- [Talk](#)
- [Contributions](#)
- [Log in](#)
- [Request account](#)

### **Namespaces**

- [Page](#)
- [Discussion](#)

### **Variants**

### **Views**

- [Read](#)
- [Edit](#)
- [View history](#)
- [PDF Export](#)

### **More**

### **Search**

### **Navigation**

- [Main page](#)
- [Recent changes](#)
- [Random page](#)

- [Help about MediaWiki](#)

## Tools

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)
- [Cite this page](#)
- [Browse properties](#)

• This page was last modified on 31 January 2018, at 15:38.

- [Privacy policy](#)
- [About Earthwise](#)
- [Disclaimers](#)

