

SITE

Name: Burrator Quarries

Parish: Walkhampton

Local Authority: Dartmoor National Park

National Grid Ref: SX 549 677

OS Sheets: 1:50K, 201, 202, 1:10K, SX56 NW, NE

Locality Description: Burrator Quarries lie 3km east of Yelverton on the southwestern edge of Dartmoor.

Nature and Status of Site: The site comprises two small disused roadside quarries. It is a Site of Special Scientific Interest (SSSI).

Summary of Geological / Geomorphological Interests: This site features rare exposures of the contact between the Permo-Carboniferous Dartmoor Granite and Devonian country rocks of the Kate Brook Formation. The contact is highly irregular and shows evidence of mobilisation of the metasediments and segregation of felsic and mafic constituents. The contact country rocks have been thermally metamorphosed to form hornfels with extensive tourmalinisation.

This site forms part of a geology/landform trail around the Burrator area. Contact Dartmoor National Park Authority, Tel. 01822 890459 for details

Safety Considerations: There are some steep cliffs around the edge of the quarries, with a lot of vehicle activity both at the quarry base and along the road between the two quarries.

Educational Age Groups: Secondary, College/6th Form, University.

Parking and Access: The site is accessed from the minor road heading east from Yelverton towards Burrator Reservoir. The site lies west of the road approximately 300 metre south of the reservoir's dam. Vehicles can be parked in the southern quarry, which is used as a car park by tourists/visitors.

References

Brammall A. & Harwood H. F. (1932). **The Dartmoor Granites: Their Genetic Relationships**. Quart. Jour. Geol. Soc. London, **88**, 171-237.

Exley C. S. & Stone M. (1982). **Hercynian Intrusive Rocks: Petrogenesis. In Igneous Rocks of the British Isles**, (Ed. D. S. Sutherland), Wiley, Chichester, pp 311-20.

Floyd, P. A, et al. (1993). **Igneous Rocks of South-West England**. GCR Series No.5, Joint Nature Conservation Committee, Peterborough, and Chapman and Hall, 256pp.

Detailed Geology: Burrator Quarries is one of the few places where the contact between the coarse, megacrystic biotite granite of Dartmoor can be seen with Upper Devonian country rocks. The zone shows slight mobilisation, tourmalinisation and vein intrusion. The country rocks on the west of the Dartmoor mass are essentially pelites and semi-pelites of Famennian age belonging to the Kate Brook Formation of the 'Kate Brook Tectonic Unit'. These basinal units were first regionally metamorphosed to slaty rocks, and subsequently thermally metamorphosed by the granite. At Burrator they are spotted and banded cordierite and andalusite - bearing hornfels with a conspicuous flat-lying cleavage and extensive tourmalinisation, which is chiefly a patchy yellow-brown and blue green variety. The biotite indicates a degree of potassium metasomatism and the movement of the potassium is recorded by the occurrence of perthite close to the contact. The contact itself, although very irregular, is sharp and shows evidence of some mobilisation of the metasediments with attendant segregation of felsic and mafic constituents. The tourmalinisation has affected not only the contact hornfels but also the outer parts of the intrusion, reddening the granite especially adjacent to joints. The 'shales' at the contact zone demonstrate both the chemical exchanges consequent upon intrusion and the effects upon the granite magma of the assimilation of xenoliths. The general view is still held that the earliest magma was lower crustal and palaeogenetic in origin. It rose through a pile of sediments and basic volcanics to its final high-level position where it consolidated in an essentially passive fashion, as the locally undeformed rocks show. Some minerals, especially biotite, were derived from the source rocks and that at low crustal levels the physiochemical condition of the magma prevented substantial assimilation.

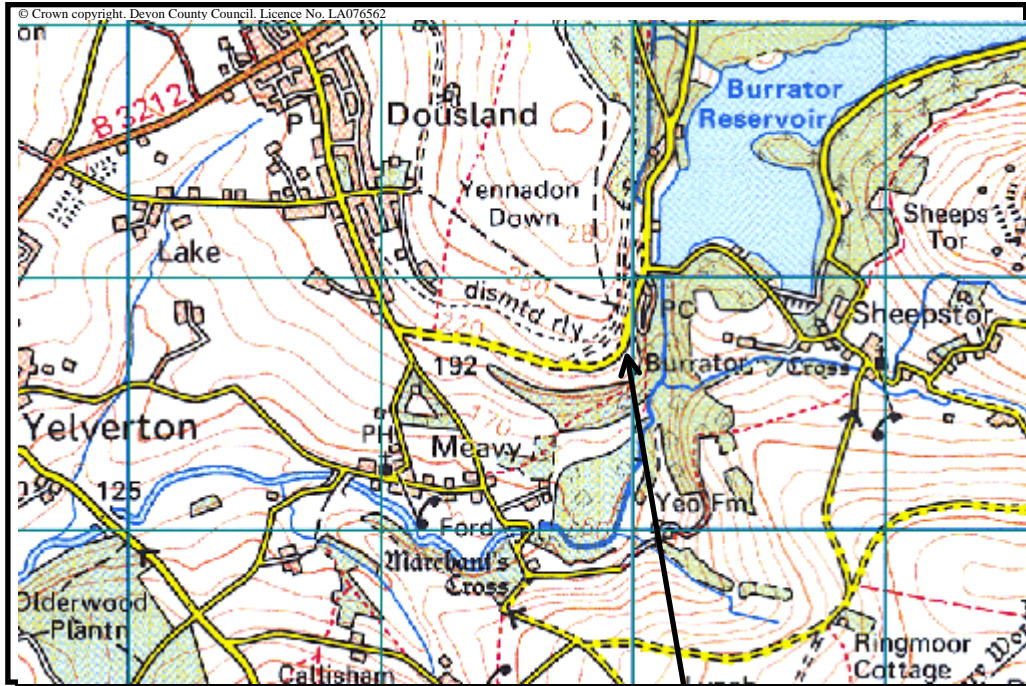
Suggested Questions

1. What features can be seen along the contact margin to suggest that mobilisation has taken place (i.e. colour differences, mineral concentrations/depletions).
2. To what extent can the effects of the contact metamorphism be traced away from the site. What characteristics of the altered rocks can be used to establish a limiting boundary?
3. What geomorphological relationships can be distinguished between the granite, the altered country rocks and the unaltered country rocks? What bearing has this had on the surrounding topography?

LOCATION PLAN

BURRATOR QUARRIES, SSSI WALKHAMPTON, DARTMOOR NATIONAL PARK

National Grid Ref: SX 549 677



Scale 30,000

Roadside quarries
south of Burrator
Reservoir

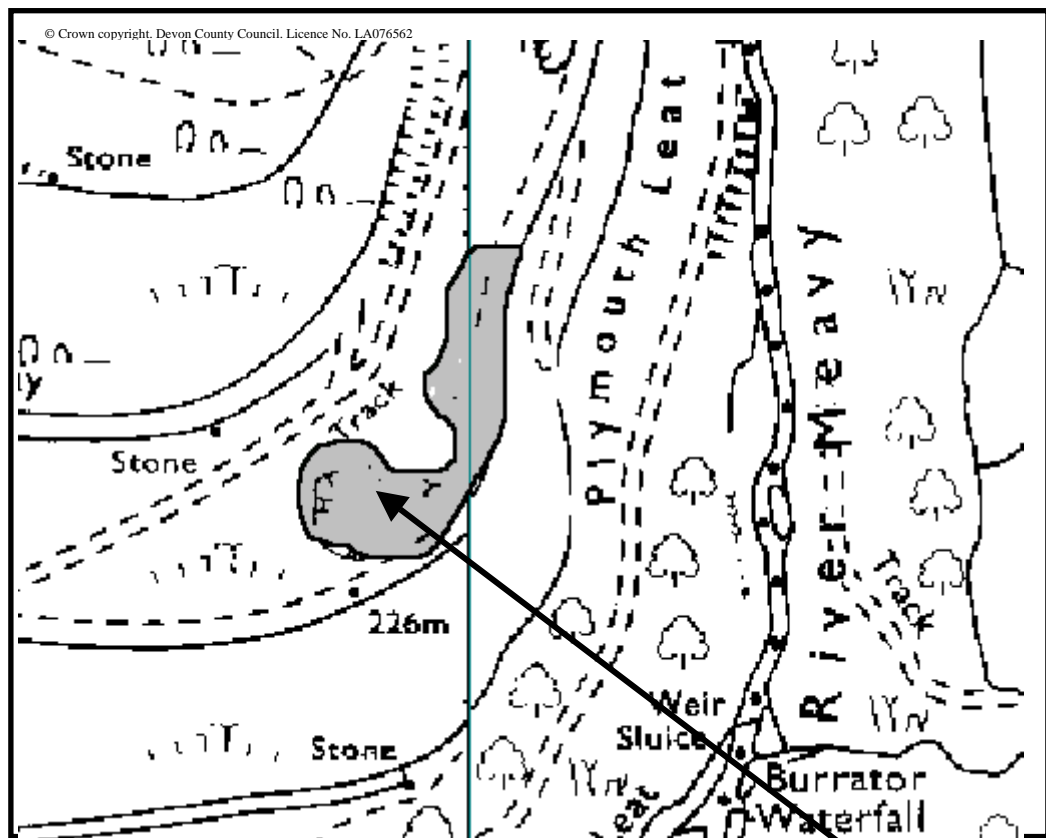
Parking and Access

Car parking available in southern quarry, providing immediate access to geological exposures. Second disused quarry a very short distance up the road to the north.

SITE PLAN

BURRATOR QUARRIES WALKHAMPTON, DARTMOOR NATIONAL PARK

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Approx. S.S.S.I Boundary

Scale 1 : 3,750

Location of contact
between granite and
country rocks

Main Points of Interest:

- Contact between the Permo-Carboniferous Dartmoor granite and Devonian country rocks of the Kate Brook Formation.
- Thermal metamorphism of country rocks to hornfels.