

DONEGAL - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	Barnesmore Granite
IGH THEME	IGH11 Igneous Intrusions
TOWNLAND(S)	Edergole
NEAREST TOWN	Donegal
SIX INCH MAP NUMBER	85
ITM CO-ORDINATES	596677E, 888919N
1:50,000 O.S. SHEET NUMBER: 11	GS1 BEDROCK 1:100,000 SHEET NOS. 3, 4
GIS Code DL003	

Outline Site Description

Well exposed, semi-circular site on the steeply mountainous Mullaghnaadresruhan hillside with tall tussocky grass, bracken and bog.

Geological System/Age and Primary Rock Type

The Caledonian Barnesmore Granite, part of the Donegal Batholith, was intruded into Dalradian schists. It has been dated at 397 Ma. The primary rock type at the site is a red chloritic monzonite.

Main Geological or Geomorphological Interest

The site is a kilometre-wide semi-circular exposure bounded to the southeast by the Belshade Fault. Most of the surrounding area is formed by the main granite of the Barnesmore pluton, a non-porphyrific monzogranite (typically ~30% quartz, ~68% feldspar and 2% biotite). However, at this site the granite has undergone *in-situ* alteration to red chloritic monzonite, seen as irregular areas up to 30m across. This alteration, involving the removal of quartz (desilication) and alteration of biotite to chlorite, is interpreted as resulting from the late devolatilization of the granite magma at depth. The removed quartz was deposited in the granite adjacent to the desilicated zone and the neighbouring granite is characterized by abundant milky-white quartz.

Volatile-rich metasomatic fluids released from the granite magma during the late stages of crystallization have been suggested as the cause of the granite alteration. These fluids have been linked to the development of explosive vents and quartz pipes at higher structural levels in the pluton. The Belshade Fault has displaced the rocks on its southeastern side by over 3km, relative to those northwest of the fault. Before this movement, the area of desilication on the northwest of the fault would have been adjacent to northwest–southeast-trending appinitic breccia pipes (explosive vents) and associated lamprophyric dyke intrusions on the southeastern side of the fault.

Site Importance – County Geological Site; may be recommended for Geological NHA

The site contains particularly good exposures of this important lithological variant of the Barnesmore granite and is of particular interest to geologists and researchers in mineralogy and geochemistry. The zones of desilication exposed here represent a late-stage modification of the original granite mineralogy and chemistry.

Management/promotion issues

The site is likely to be of interest mainly to geologists and does not require further promotion. It is within unspoilt mountainside and not under any apparent threat. The River Finn SAC (002301), listed for active blanket bog in upland areas, lies immediately northeast and east of the site as does the overlapping Owendoo and Cloghervaddy Bogs proposed NHA (002046).



Looking northwards from Lough Gulladuff at the Barnesmore Granite of Mullaghnaadreesruhan.



Desilicated monzonite beside Belshade Fault valley.

