

# GALWAY - COUNTY GEOLOGICAL SITE REPORT

<b>NAME OF SITE</b>	<b>Knocknagreana</b>
Other names used for site	<i>Cnoc na Gréine</i>
<b>IGH THEME</b>	<b>IGH11 Igneous Intrusions</b>
<b>TOWNLAND(S)</b>	<b>Furboghgarve (Na Forbacha Garbha)</b>
<b>NEAREST TOWN/VILLAGE</b>	<b>Na Forbacha (Furbo)</b>
<b>SIX INCH MAP NUMBER</b>	<b>93</b>
<b>ITM CO-ORDINATES</b>	<b>520435E 722465N</b>
<b>1:50,000 O.S. SHEET No. 45</b>	<b>GSI BEDROCK 1:100,000 SHEET NO. 14</b>

## Outline Site Description

This site includes rocky outcrops and a boulder beach along a coastal section between Bearna and Na Forbacha.

## Geological System/Age and Primary Rock Type

Bedrock comprises mostly Magma Mixing-Mingling Zone (MMZ) granodiorite with mafic microgranular enclaves. The MMZ is a characteristic feature of the late-Caledonian Galway Batholith, which trends WNW-ESE (west northwest / east southeast) across the Central Block of the batholith. Other lithologies occurring at the site include a porphyry dyke, the Callowfinish Granite at the low tide zone, and a 120 m long NW-SE (northwest-southeast) trending 60 cm thick diorite dyke.

## Main Geological or Geomorphological Interest

Sometimes referred to as the Barna Mixing-Mingling Zone (BMZ), the BMZ comprises a hybrid granodiorite in which mafic microgranular enclaves (MME) are distributed. The BMZ granodiorite is a coarse-grained grey rock with large K-feldspar phenocrysts, up to 5 cm in length, and forming 5-20% of the mineral composition. The phenocrysts are embedded in a groundmass of plagioclase feldspar, quartz, biotite, K-feldspar and hornblende. The granodiorites host mafic microgranular enclaves (MME).

Other textures identified in the BMZ attributable to the magma mixing and mingling include rapakivi feldspars (K-feldspar rimmed by plagioclase), quartz ocelli (light-coloured quartz crystals rimmed by a dark halo of hornblende or biotite), inclusion zones of plagioclase, biotite or hornblende 'inside' K-feldspars, and the aforementioned K-feldspar phenocrysts.

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

The Galway Batholith MMZ comprises mafic sheets and microgranular enclaves which are interpreted to represent interaction of granitic and dioritic magmas. Research carried out at this site by S. Baxter identified a multitude of features associated with magma-emplacement and the interactions of different magmatic mineral assemblages, at scales of millimetres to tens of metres. This is an important County Geological Site and is worthy of consideration as a geological NHA.

## Management/promotion issues

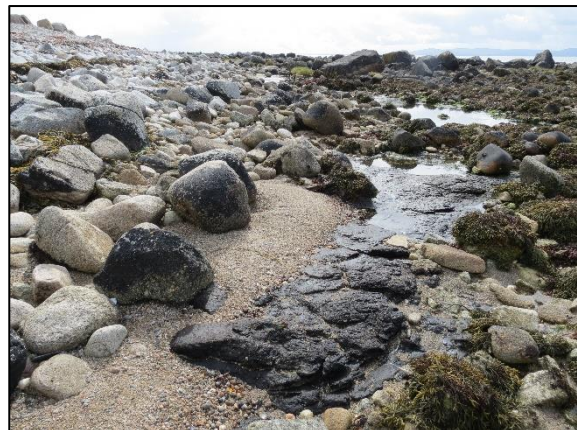
The site can be accessed via a lane leading from the Bearna-Na Forbacha road, immediately west of the high granite stonewall at Knocknagreana. Alternatively, the site can be accessed along the shoreline from east or west when tide and weather conditions are favourable. The site is an excellent teaching and research field location, owing to the variety of observable lithological and mineralogical features here, and the ease of access.



Granodiorite bedrock and loose boulders at Knocknagreana. The Burren's limestone hills visible on the south side of Galway Bay.



Granite boulder beach – looking west in the direction of Barna.



Drowned peat layers exposed under sand and beach boulders.



Callowfinish Granite outcrop at Knocknagreana.



Large pink K-feldspars in the Mixing-Mingling Zone granodiorite.



