

DONEGAL - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	Kilkenny Breccia Pipe
IGH THEME	IGH11 Igneous Intrusions
TOWNLAND(S)	Kilkenny, Maas, Gortnasillagh
NEAREST TOWN	Glenties
SIX INCH MAP NUMBER	65
ITM CO-ORDINATES	577670E, 897985N
1:50,000 O.S. SHEET NUMBER: 10	GS1 BEDROCK 1:100,000 SHEET NOs. 3, 4
GIS Code DL018	

Outline Site Description

The Kilkenny Breccia Pipe is present in a small outcrop that is extremely inaccessible in the midst of thick gorse.

Geological System/Age and Primary Rock Type

The breccia pipe was emplaced into pelitic schists of the Lower Falcarragh Pelite Formation, part of the Dalradian Appin Group (deposited c. 800 to 750 Ma and metamorphosed between 475 and 385 Ma). The breccia comprises a granophyre matrix containing clasts of quartzite that come from the underlying Ards Quartzite or Sessiagh-Clonmass Formations. Immediately north of the breccia pipe is a small appinite intrusion, part of the appinite suite associated with the Ardara granite and other early Donegal plutons (c. 400 Ma).

Main Geological Interest

The Kilkenny Breccia Pipe is an oval-shaped intrusion breccia pipe, showing quartzite pebbles (three-faced protrusions on the weathered surface) in a granophyric matrix. The pipe is associated with a nearby appinite intrusion. The appinites were derived from gas-rich ultrabasic mantle magma and emplaced along fractures and bedding planes as pipes, dykes and sills. Two types of breccia are associated with the Donegal appinite suite: 1) intrusion breccia pipes, containing country rock transported over varying distances, and 2) marginal breccias, forming a capping to appinitic intrusions, for example at Naran Hill.

The Kilkenny Breccia Pipe was formed through explosive pressure from upward-streaming gas-rich magma causing fragmentation of the enclosing rocks. Upward extending fractures allowed extremely rapid ascent of the brecciated rock fragments within the gas-rich magma. The breccia pipe is the rock that remains after the process is finished, filling the fracture.

In the Kilkenny Breccia Pipe, quartzite fragments seem to have been transported upwards from their source at least 300 m below their current position. Their edges are sub-rounded as a result of abrasion during transport (in contrast to the locally derived angular clasts of the Dunmore Head breccia) and they are also oriented broadly parallel to each other, supporting the important role of gas-streaming in the development of breccia pipes. The Kilkenny Breccia Pipe, and others, have also been referred to in the literature as 'diatremes', although this term is more commonly used in the context of the associated deposition of economically significant minerals.

Site Importance: County Geological Site

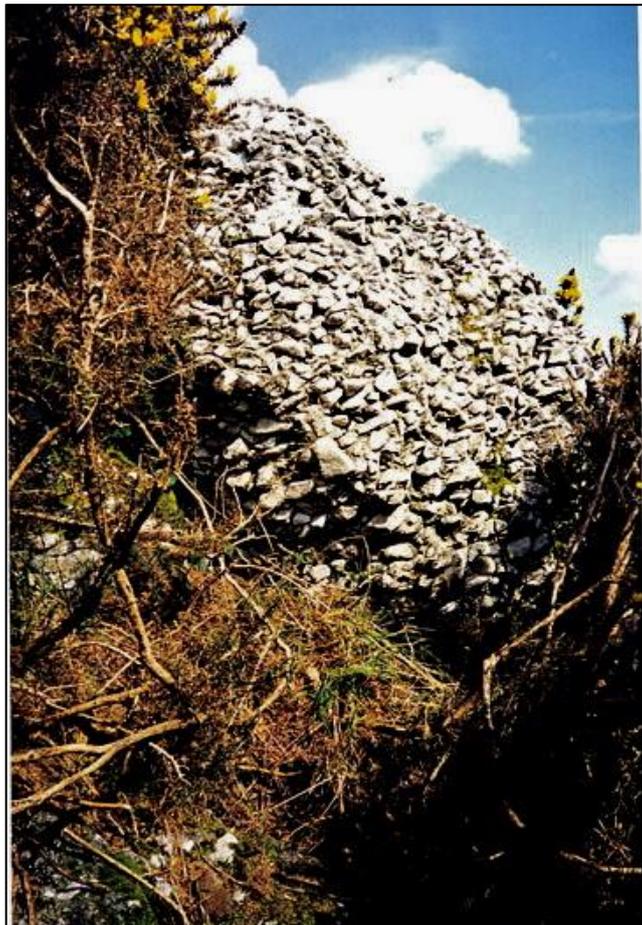
The Kilkenny Breccia Pipe is an excellent example of an intrusion breccia formed by the explosive interaction of gas-rich magma and surrounding rock, and it shows a difference in the degree of transportation of brecciated clasts compared with other pipes such as at Dunmore Head. The appinite also provides important evidence for the model of origin and emplacement of the satellite intrusions associated with the Ardara pluton.

Management/promotion issues

Although a pathway was cut through the gorse to the breccia outcrop in 2004, this clearing has not been maintained and the site was largely inaccessible at the time of this audit. Its interest is probably mainly for geology students and researchers.



Kilkenny Breccia site in the midst of gorse.



The Kilkenny Breccia Pipe, showing weathered quartzite pebbles.

