DONEGAL - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	**Loch Choillte Feannaid**
Other names used for site	Kiltyfanned Lough
IGH THEME	**IGH 5 (Precambrian)**
TOWNLAND(S)	**Kiltyfanned, Lougheraherk**
NEAREST TOWN/VILLAGE	**Glencolumbkille**
SIX INCH MAP NUMBERS	**81**
ITM CO-ORDINATES	**558018E, 888406N (west), 558751E, 888368N (east)**
1:50,000 O.S. SHEET NUMBER: 10	**GSI BEDROCK 1:100,000 SHEET NOs. 3, 4**
GIS Code DL020	

Outline Site Description
The Port Askaig Formation tillite is very well exposed north of the road at the east end of Kiltyfanned Lough, in hilly outcrops among rough pasture and moorland. A second site to the east shows good exposures of the tillite in outcrops south of the road.

Geological System/Age and Primary Rock Type
The Port Askaig Tillite is a glaciomarine sequence of diamictites and interbeds within the basal Argyll Group of the Dalradian and is thought to have been deposited during the Sturtian Glaciation (750 – 700 Ma).

Main Geological or Geomorphological Interest
This site has one of the best exposed sections through the Port Askaig Formation and related succession in Ireland. The formation is up to 118m thick here and contains 13 diamictites (tillites).

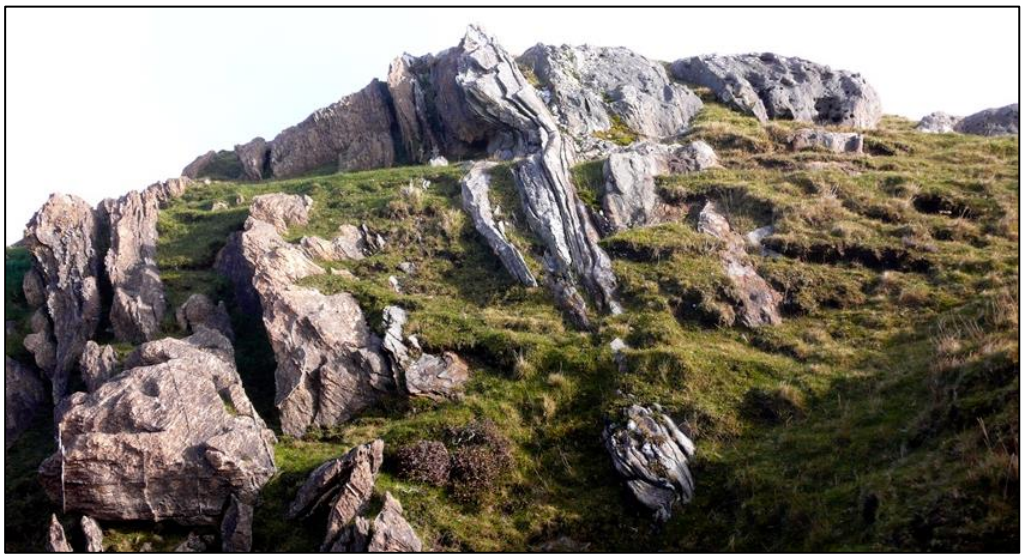
The lower part of the Port Askaig Formation (greenish-grey dolomitic psammite) contains lenticular clasts of marble derived from the underlying Glencolumbkille Limestone Formation. The clasts, interpreted as dropstones, are in places weathered to form cavities. Higher in the Port Askaig Formation, the psammites become siliceous and diamictites are more abundant with quartzite and granite the most common dropstone lithology. Dropstones in some of the interbeds may have been derived from floating icebergs but the formation is now interpreted to have been deposited mainly beneath an ice sheet grounded in a shallow sea. There is evidence of limited tidal reworking beneath the ice sheet.

At the eastern site, ice-wedge clasts can be seen on a diamictite bedding plane. They are thought to have formed when overlying sediment filled cracks in the diamictite that had been wedged open by ice.

Site Importance: County Geological Site; recommended for Geological NHA
Glaciomarine deposits of this age are widespread globally and there is much academic interest in global evidence for Dalradian glaciations. Kiltyfanned Lough is a very accessible and well-documented site that is of international significance. The Sturtian glaciation has been linked to the “Snowball Earth” hypothesis, which proposes that the surface of the earth was entirely frozen or nearly frozen prior to 650 Ma.

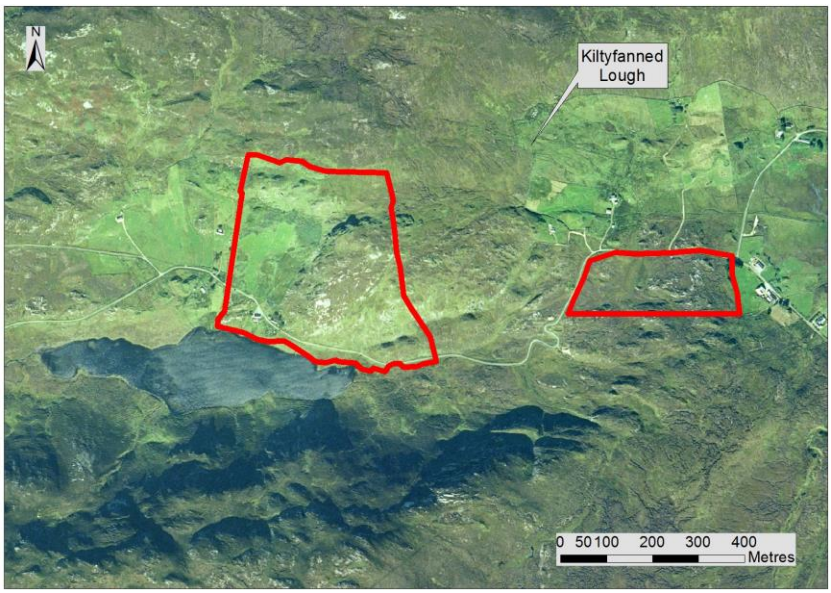
Management/promotion issues
There is good access by road to Kiltyfanned Lough. The site is mainly of academic interest and also serves as a good teaching location. It represents an important part of the complex geological history of Donegal and warrants promotion as such. The eastern and most of the western part of the site are within the Slieve Tooey / Tormore Island / Loughros Beg Bay SAC and proposed NHA (00190). The site does not appear to be under any threat.

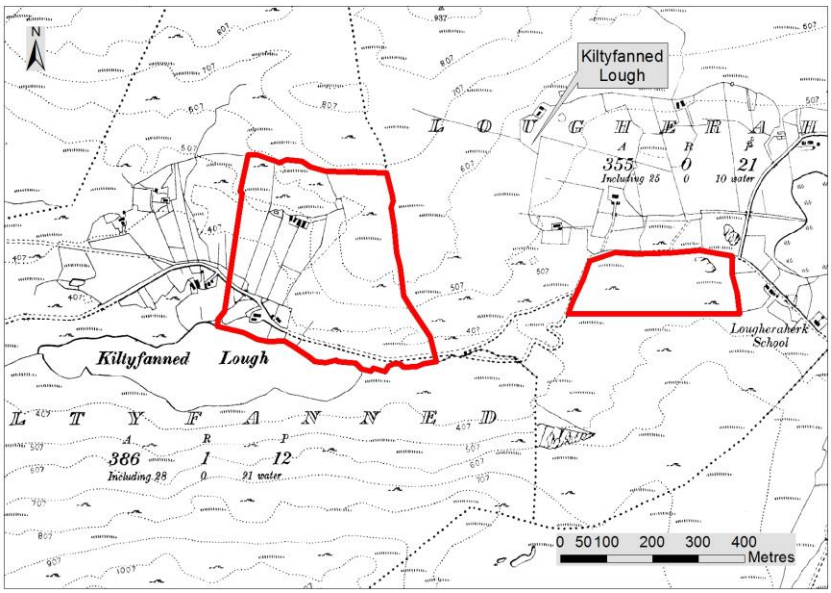
Kiltyfanned Lough (western part), view southwards with Slieve Tooey Quartzite in foreground, Port Askaig Tillite on hill.



Kiltyfanned Lough (western part), Glencolumbkille Formation dolomite (left) and Port Askaig diamictite (right).

Diamictite with dolomite and granite clasts (dropstones) (left) and ice-wedge clasts at eastern part of site (right).





McClure *et al.* 2019. Geological Survey Ireland.