Spireslack Locality 2: Palaeogene dyke intruding mudstones and ironstones

NGR: [274539 630416] [NS 74539 30416]

Key category of interest	Rarity	Quality
1. Igneous rocks	4	5
2. 3D visualization	4	4
3. Stratigraphy	3	4
4. Sedimenrary rocks	1	2
5. Structural geology	2	2

Access: Good access to base of exposure, easily accessible from roadway.

Current safety: Potential loose overhanging blocks above section.

Measures to enhance site: Viewing platform 5 m away, level spoil at base of section.

Key categories in order of interest (1 = primary interest); Rarity, 5 = only example in Spireslack, 1 = many examples in Spireslack; Quality 5 = exceptional preservation in Spireslack, easy access/viewing potential 1 = average preservation in Spireslack, difficult access/viewing potential

Photograph overview with polygon boundary

(Overview of Locality 2). Site boundary includes key rock exposures, immediate access to site and viewpoints to the site. Photo looking north.

Site description

Geology

An exceptionally well exposed Palaeogene quartz dolerite dyke intrudes the Limestone Coal Formation at this locality. The intrusive contact with the Limestone Coal Formation displays chilled margins, mineralisation and alteration of the surrounding mudstone units. The Limestone Coal Formation is also slightly offset across the dyke. Movement along fracture planes within the mudstone, associated with a nearby fault, has caused polishing of the mudstone. There are also small thrust faults developed within the sequence, highlighted by the stronger ironstone layers. The same dyke is also exposed in the scarp (inaccessible), and whilst the dyke itself has been dug out of the void during coal extraction, this location provides an important reference point for providing an indication of orientation, scale and 3D sense of the intrusion. See also Locality 14 for description of geology surrounding dyke exposure in the scarp.

Access and enhancement suggestions

The dyke is easily accessible on foot from roadways and would provide hands on access as a teaching locality. However, there are loose blocks in the face and the mudstone is liable to weathering — this would require inspection by qualified personnel if the site is to be used for close inspection. Alternatively a viewing platform 5 m from the base of the section would also provide a good viewpoint.

Site photographs

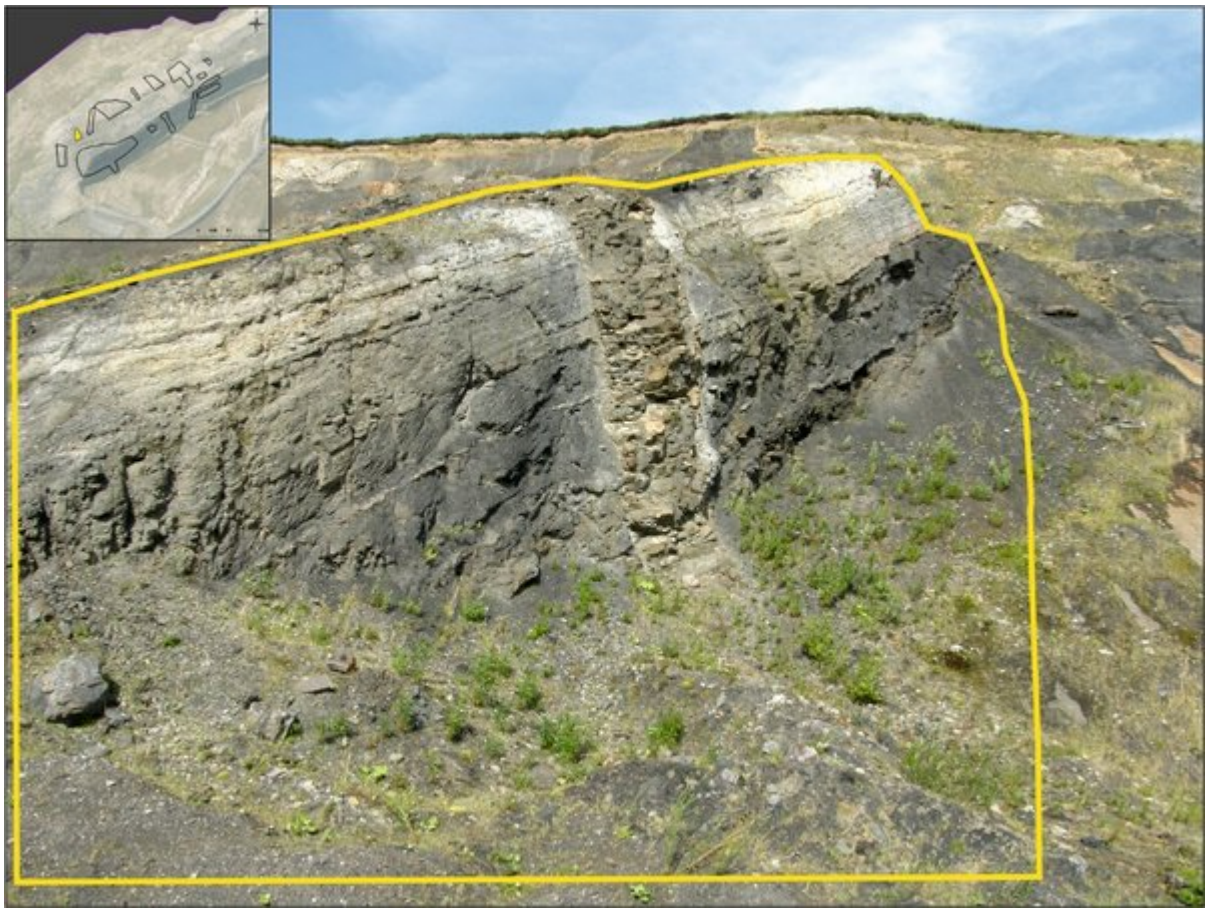
(Spireslack_2 P1) Palaeogene dyke intruding mudstones and siltstones of the Limestone Coal Formation. © BGS, NERC.

(Spireslack_2 P2) The same dyke exposed in the main scarp, cutting the Limestone Coal Formation. Note, where the dyke is in contact with coal it is altered to white trap: the result of volatiles released during intrusion of magma into carbonaceous rocks (e.g. coals, mudstones). © BGS, NERC.

(Spireslack_2 P3) The left image shows development of small thrust faults within the Limestone Coal Formation, highlighted by ironstone layers. The stronger ironstone layer is buckled and faulted — the same structures are not observed in the mudstone as it is a weaker unit, and deforms along multiple internal fractures. © BGS, NERC.

(Spireslack_2 P4) These internal fractures display heavily polished surfaces, evidence of the rocks on either side moving past each other (see right image). © BGS, NERC.

References



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(Spireslack_2 P2) The same dyke exposed in the main scarp, cutting the Limestone Coal Formation. Note, where the dyke is in contact with coal it is altered to white trap: the result of volatiles released during intrusion of magma into carbonaceous rocks (e.g. coals, mudstones). © BGS, NERC.

(Spireslack_2 P3) Development of small thrust faults within the Limestone Coal Formation, highlighted by ironstone layers. The stronger ironstone layer is buckled and faulted &mdash the same structures are not observed in the mudstone as it is a weaker unit, and deforms along multiple internal fractures. © BGS, NERC.

(Spireslack_2 P4) Internal fractures display heavily polished surfaces, evidence of the rocks on either side moving past each other (see right image). © BGS, NERC.