

Site name: Crime Rigg Quarry

Unitary Authority: Durham

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981, and subsequently varied under Section 28A of the Wildlife and Countryside Act 1981. Additional land notified under Section 28B of the Wildlife and Countryside Act 1981.

Local Planning Authority: Durham County Council

National Grid reference: NZ 348416

Area: 32.03 ha

Ordnance Survey Sheet 1:50,000: 88

Date notified: 19 December 1990

Date of variation: 18 October 2019

Date additional land notified: 18 October 2019

Reasons for notification

Crime Rigg Quarry is a key reference section for the Permian Yellow Sands Formation: extensive exposures through the Yellow Sands Formation, with overlying Marl Slate and Raisby Formations, are present. The Yellow Sands Formation is interpreted as a linear (Seif) desert dune system and the relationship with the overlying marine Marl Slate and Raisby Formations marks the onset of the Upper Permian Zechstein transgression (sea level rise). This site has been identified as of national importance in the Geological Conservation Review.

General description:

Crime Rigg Quarry exposes an extensive vertical and lateral section through the Permian Yellow Sands Formation and its relationship with the overlying Marl Slate and Raisby Formations.

The Yellow Sands here reach approximately 30 metres in thickness, thinning eastwards. They exhibit complex large scale cross-bedding with typically well rounded (and often frosted) sand grains characteristic of an aeolian (desert) environment. The Yellow Sands have been interpreted as a linear (Seif) dune system (examples of which are found in the present day Sahara) made up of a series of elongate ridges or 'draa' (up to 20 metres thick, 1.5 to 3.5 km wide, and 13 km long) that migrated across the area at the end of the Middle Permian, approximately 290 million years ago.

The overlying marine Marl Slate (up to 4 metres thick) infills hollows in the upper surface of the Yellow Sands. It represents the rapid inundation and rise in sea level of the Upper Permian Zechstein Sea and is followed by the deposition of the Magnesian Limestone of the Raisby Formation, about 255 million years ago.

Crime Rigg Quarry provides a cross-section through part of one of the Seif ridges. The Yellow Sands thin towards the east as they approach the outer edge of the dune ridge, and the thickness of the overlying Marl Slate and, particularly, the Raisby Formation increases. Crime Rigg enables a detailed (and three dimensional) understanding of the mechanism of dune formation (both lateral migration and vertical accretion) and the subsequent sea level rise that marked a significant environmental change from a desert to marine environment.