



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Brook Cottage, Llangybi	File Number: Site_249_87
RIGS Number: 706	Surveyed by: Gareth Owen
Grid Reference: ST 3550 9568	Date of Visit: 24 th August 2011
RIGS Category: Scientific	Date Registered:
Earth Science Category: Stratigraphy, palaeo-environment, sedimentology	Owner: Unknown Planning Authority: Monmouthshire County Council
Site Nature: A short stream section and road section	Documentation prepared by: Gareth Owen
Unitary Authority: Monmouthshire County Council	Documentation last revised: 25 th August 2011
OS 1:50,000 Sheet: 171	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: E249	
<p>RIGS Statement of Interest:</p> <p>The section of rocks exposed here is made up of silty mudstones, siltstones and sandstones which formed during the transition from marine to land conditions in late Silurian times. This RIGS includes an extension to the stream section exposed in the adjacent Brook Cottage Site of Special Scientific Interest (SSSI), plus a roadside exposure in the bank of a minor road. The SSSI stream section comprises the predominantly olive-grey, very fossiliferous calcareous siltstones of the Leintwardine and Whitcliffe Groups (Ludfordian Stage of the Ludlow Series). This lithology continues into the northern edge of the RIGS, but is then conformably overlain by the sandstone of the Downton Castle Sandstone Formation (Přídolí Series). The road-side exposures have yielded fish and other faunal fragments at the very base of this sandstone, indicating the presence of a local equivalent of the Ludlow Bone Bed Member.</p> <p>Farther downstream still, the Downton Castle Sandstone Formation passes into the characteristic red mudstone of the Raglan Mudstone Formation. This RIGS is the only locality amongst the marine Silurian rocks of the Usk area that shows clearly the full Whitcliffe-Ludlow Bone Bed-Downton Castle-Raglan Mudstone sequence, evidencing the transition from marine Ludlow to the non-marine conditions of the Přídolí.</p>	

Geological setting/context:

Brook Cottage lies within the Usk Inlier, a parcel of Silurian rocks at the core of an anticline, exhumed to form a window into Wenlock and Ludlow times within the surrounding, younger Devonian and Carboniferous stratigraphy. During Wenlock and early Ludlow times, the area around Usk lay on the southern margins of the Welsh Basin, beneath the shallow shelfal seas of the Midland Platform (Aldridge *et al.* 2000). This shallow, tropical sea provided the environment in which fossil-rich calcareous siltstones and reef-rich limestones were formed. An example of the former can be seen in the SSSI stream section immediately to the north of this RIGS, whilst the latter can be seen in Cilwrgi Quarry SSSI (ST 3396,9837).

Throughout the Silurian period the last remaining vestige of the Iapetus Ocean was slowly being closed through the northward advancement of the continents of Baltica and Avalonia towards Laurentia. These colliding continents decreased the size of the basin whilst uplifting the adjacent landmass, leading to more erosion and hence increasing sediment input to the basin (Cherns *et al.* 2006). The combined result was a diachronous transition from shallow marine to marginal marine and eventually terrestrial environments across the Welsh Basin as it rapidly filled with sediment. This effected the transition seen in the stratigraphy from marine Ludlow up into the Old Red Sandstone of the Přídolí.

The sequence of sediments seen in this RIGS represents the gradual change from the shallow shelf seas (calcareous shales of the Upper Whitcliffe Group) through a marginal marine environment (bone-bed lag deposits and sand shoals of the Downton Castle Sandstone) into the fluvial or perhaps coastal mudflats of the Raglan Mudstone Formation (Aldridge *et al.* 2000).

References:

ALDRIDGE, R J, SIVETER, David J, SIVETER, Derek J., LANE, P D , PAMLER, D. & WOODCOCK, N H. 2000. *British Silurian Stratigraphy*, Geological Conservation Review Series, No. 19, Joint Nature Conservation Committee, Peterborough.

CHERNS, L, COCKS, L R M, DAVIES, J R, HILLIER, R D, WATERS, R A, WILLIAMS, M. 2006. Silurian: the influence of extensional tectonics and sea level changes on sedimentation in the Welsh Basin and on the Midland Platform. In Brenchley P.J. & Rawson, P.F. 2006 *The Geology of England and Wales 2nd Edition*, The Geological Society, London.

SECTION B

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:



Comment: Parts of the section require scrambling into and along a stream bed on private land, whereas others are accessible via public road. In general access is difficult.

Safety:



Comment: At times of low water the main hazard is slippery rocks underfoot. At times of high water the stream section part of the site will be inaccessible.

Conservation status: This site has been highlighted as a proposed extension of the adjacent GCR and SSSI, and as such is a proposed SSSI. Designation as RIGS will provide awareness of the importance of this site until such time as SSSI status is achieved.

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Not known.

Planning Authority: Monmouthshire Country Council

Planning status/constraints/opportunities: Not known.

CONDITION, USE & MANAGEMENT:

Present use: Stream section and roadside section. Adjacent land is a mixture of woodland and farmland.

Site condition: Generally good, but overgrown in places.

Potential threats: Growth of vegetation obscuring the rock exposures further

Site Management: Some control of vegetation may be needed in places.

SITE DEVELOPMENT:

Potential use (general): The site is of use for scientific purposes, providing a complete sequence through the late Silurian marine – terrestrial transition in the Usk Inlier.

Potential use (educational): Generally poor, due to the difficult access in places and the water hazard, but perhaps useful as a teaching site for small groups of university students.

Other comments:

Photographic Record



Photo 1: Key exposure with grey siltstones of Upper Whitcliffe formation at base, Downton Castle Formation above, the bottom 10cm of which is interpreted as the local equivalent of the Ludlow Bone Bed.

Photo 2: More competent Downton Castle Sandstone forms a reef in the stream bed approximately 5m downstream of the road bridge



Photo 3: Raglan Mudstone Formation exposed in both banks of the stream approximately 20m downstream from the road bridge.