



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Pwll-calch quarried crags	File Number: Site_RAW_JRD_21
RIGS Number: 714	Surveyed by: R A Waters and J R Davies
Grid Reference: SN 7676 2852	Date of Visit: 19 th January 2011
RIGS Category: Scientific	Date Registered:
Earth Science Category: stratigraphical, palaeontological, sedimentological	Owner: Unknown Planning Authority: Carmarthenshire County Council
Site Nature: Quarried crags and small disused quarry	Documentation prepared by: R A Waters
Unitary Authority: Carmarthenshire County Council	Documentation last revised: 8 th March 2012
OS 1:50,000 Sheet: 146	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: O12	
BGS 1:50,000 Sheet: E212	
<p>RIGS Statement of Interest:</p> <p>Pwll-calc quarried crags is part of a network of sites demonstrating the evolution of the south-east margin of the Lower Palaeozoic Welsh Basin during the mid to late Silurian. It has been proposed as a RIGS as it provides a semi-continuous section through a unique part the latest mid Silurian succession in the south-western part of the Myddfai Steep Belt. It provides an accessible section in the latest Wenlock, Halfway Farm Formation that is characterised by the presence of thick units of limestone that punctuate the predominantly mudstone succession.</p> <p>In the section, the limestones contain abundant bryozoa and crinoid and are probably in part a fossil reef. This locality is unique and needs further research. The Halfway Formation represents a slight deepening of sea level at the end of the Wenlock.</p> <p>It provides an excellent section for those interested in scientific research into the stratigraphy, palaeontology and sedimentology of the latest Wenlock rise in sea level. It also provides an excellent locality for researchers to study fossil bryozoan reefs. The site is not suitable for students as it has not been elucidated in detail yet.</p>	

Geological setting/context:

The site is situated on a small north-west facing scarp at Pwll-calc farm, south west of Myddfai and comprises quarried crags (in the south west) and a quarry (in the north-east), separated by a narrow grassy slope. It provides a very accessible section in one of the limestone developments in the late Wenlock Halfway Farm Formation. The site was first noted by Price (1957) who recorded limestones near the top of the Wenlock succession in a study of the Ludlow stratigraphy of the area (Potter and Price 1965). The Halfway Farm Formation was erected by Barclay et al. (2005) to describe the green shelly mudstones with scattered thin sandstones and limestones that cap the Wenlock succession in the central part of the Myddfai Steep Belt. The formation is characterised by the local presence of thick units of medium to thick bedded limestone at various levels, notably the base, the middle and near the top.

The locality exposes the topmost part of the underlying Sawdde Sandstone Formation and the lowest 14 m of the Halfway Farm Formation. The succession dips steeply (75-80 degrees) south –east. The Sawdde Sandstone Formation comprises medium bedded muddy sandstones and sheet sandstones in beds to 10 cm thick. Small crags are seen on the narrow grassy slope between the quarried crags and the quarry.

The best exposure in the Halfway Farm Formation limestones is in the quarried crags. The following succession is seen:

- Poorly exposed bryozoan/ crinoidal packstone with some crinoidal grainstone.....4 m
- Gap..... 1 m
- Coarse crinoidal grainstone3 m
- Thick bedded to massive, locally rubbly, bryozoan packstone with some crinoid.5.5 m

The bryozoan packstones comprise densely packed bryozoa with a fine-grained packstone matrix, that is locally dolomitised. The dolomite is coarse grained and brown and gives rise to a ‘chicken wire texture’ in the limestone. The lack of bedding or tractional structures suggests the bryozoan packstones may be reefs, but further work is needed to verify this. The crinoidal grainstones also lack tractional structures and therefore may reflect reef flank facies. The limestones cannot be traced beyond the RIGS suggesting that they are lenticular in geometry.

The uppermost part of the Sawdde Sandstone Formation represents the acme of the Wenlock progradation that affected the Myddfai Steep Belt. Shallowing in the area of the RIGS was to within storm wave base but below fair weather wave base, and probably represents a lower shoreface environment. The sudden appearance of the limestones of the Halfway Farm Formation above the Sawdde Sandstone records a minor transgressive deepening prior to the major early Ludlow deepening (Barclay et al. 2005; Schofield et al 2009) that abruptly ended the Wenlock progradation. During the minor deepening, carbonate build-ups were probably established on highs, the intervening area accumulating muds with and abundant shelly benthos. Deposition was within storm wave base.

References:







BARCLAY, W J, DAVIES, J R, HUMPAGE, A J, WATERS, R A, WILBY, P R, WILLIAMS, M and WILSON, D. 2005. *Geology of the Brecon district - a brief explanation of the geological map. Sheet explanation of the British Geological Survey. 1:50 000 Sheet 213 Brecon (England and Wales).* (Keyworth, Nottingham: British Geological Survey).

POTTER, J F, and PRICE, J H. 1965. Comparative sections through rocks of Ludlovian-Downtonian age in the Llandovery and Llandeilo districts. *Proceedings of the Geologists Association*, Vol. 76, 379-402.

PRICE, J H. 1957. The geology of an area to the east of Llandovery, with special reference to the fauna and facies of the Ludlovian. Unpublished PhD thesis, University of Manchester.

SCHOFIELD, D I, DAVIES, J R, JONES, N S, LESLIE, A B, WATERS, R A, WILLIAMS, M, WILSON, D, VENUS, J, HILLIER, R D. 2009. Geology of the Llandovery district – a brief explanation of the geological map. *Sheet explanation of the British Geological Survey. 1:50 000 Sheet 212 Llandovery (England and Wales).*

SECTION B

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X 
Comment: Access via track from Pwll-calc farm			
Safety:			X 
Comment: quarried faces are less than 3 m high and risk of falling blocks is negligible			
Conservation status: Unknown			

OWNERSHIP/PLANNING CONTROL: Owner/tenant: owner/tenant of Pwll-calc farm Planning Authority: Carmarthenshire County Council and Brecon Beacons National Park Planning status/constraints/opportunities: Unknown. The crags and small quarry are too small to be commercially viable.
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CONDITION, USE & MANAGEMENT: Present use: Fenced woodland on a steep slope with crags. Site condition: Faces are locally covered with moss; small saplings locally adjacent to faces. Slope is uneven with scattered boulders. Potential threats: Increasing vegetation. Site Management: faces could be cleared of moss and saplings close to faces cleared.
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SITE DEVELOPMENT: Potential use (general): Potential use (educational): Good site for those researchers interested in the stratigraphy, palaeontology and sedimentology of the latest Wenlock rise in sea level. It also provides an excellent locality for researchers to study fossil bryozoan reefs. The site is not suitable for students as it has not been elucidated in detail yet.

Other comments:

Photographic Record



General view of quarried crags.



Brown, coarse-grained dolomite replacing matrix of brozoan packstone to give chicken wire fabric.



Bryozoan packstone.