



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Welsh (Glangwenlais) Quarry	File Number: Site_RAW_JRD_50
RIGS Number: 623	Surveyed by: R A Waters and J R Davies
Grid Reference: 6035 1655	Date of Visit: 21 st October 2010
RIGS Category: Scientific and educational	Date Registered:
Earth Science Category: stratigraphical, structural, sedimentological	Owner: Countryside Council for Wales Planning Authority: Carmarthenshire County Council
Site Nature: Quarry which is part of Carmel Nature Reserve	Documentation prepared by: R A Waters
Unitary Authority: Carmarthenshire County Council	Documentation last revised: 1 st February 2011
OS 1:50,000 Sheet: 159	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: 178	
BGS 1:50,000 Sheet: E230	
<p>RIGS Statement of Interest:</p> <p>The site is part of a network of early Carboniferous sites (RIGS and GCR) in south Wales that, collectively, allow the regional stratigraphy and carbonate sedimentology to be studied. The site forms part of the sub-network of sites for the Dinantian limestone crop that occurs north of the South Wales Coalfield, the so called 'north crop'.</p> <p>The Welsh quarry has been proposed as a RIGS as it offers an excellent, very accessible section through two thirds of the Carboniferous Limestone sequence that characterises the western part of the north crop of the S Wales Coalfield. In detail it provides good sections in the Dowlais Limestone, Honeycombed Sandstone and Penderyn Oolite. Contacts between the units are exposed and accessible. The quarry forms part of the Carmel Nature Reserve and is open to the public. All lifts of the quarry can be accessed by tracks.</p> <p>The site will be of interest to schools and universities for teaching purposes because of its wealth of features embracing the geology of limestones, but more importantly because of its accessibility and safety. The accessibility and excellent condition of the faces also make it an important site for researchers studying the stratigraphy, sedimentology and structural history of the Carboniferous Limestone of the region.</p>	

Geological setting/context:

Welsh quarry, now called Glangwenlais quarry on the OS 10k map, exposes the lower two thirds of the Pembroke Limestone Group succession of the western part of the north crop of the Carboniferous Limestone. Modern geological descriptions and interpretations are lacking in this area, the latest regional account being George (1927). The succession dips 25-30° toward the south and comprises:

Oxwich Head Limestone Formation:

Penderyn Oolite Member c.15m seen

Honeycombed Sandstone Member 6.5 m

Dowlais Limestone Formation c.80 m seen

The Dowlais Limestone comprises thin to thick bedded, dark grey, foetid, skeletal, argillaceous wackestones; paler, foetid, peloidal/skeletal packstones and medium grey ooid/skeletal grainstones, locally exhibiting cross bedding. Shaley partings are common. Fossils include coquinas of the brachiopod *Davidsonia carbonaria* in the grainstones, as well as gastropods and fragmentary corals. The lithologies can be examined in fallen blocks below the north face of the quarry. The formation is Holkerian in age and rests unconformably on the early Courceyan Avon Group that crops out just north of the quarry boundary (IGS, 1977). It represents the deposits of a shelf lagoon, the oolitic grainstones recording shoals or tidal deltas.

The rest of the succession is best examined on the first lift on the western side of the quarry. Here, the top of the Dowlais Limestone is defined by a palaeokarstic surface developed above skeletal/peloidal grainstones. The latter exhibit a rubbly profile resulting from associated pedogenesis. The Honeycombed Sandstone Member represents the first two minor cycles of the overlying Oxwich Head Limestone of Asbian age. The characteristic, brown-rimmed carious weathering is well developed and is best examined in large blocks at the edge of the lift roadway. The basal part of the first cycle comprises 1.5 m of dark grey mudstone with thin beds of planar and cross-laminated sandy limestone. Productid brachiopods are common as are vertical, *Skolithos* type burrows. These transgressive deposits record the initial marine flooding of the underlying subaerial surface and the reworking of fluvial sands. They are overlain by 3 m of medium bedded, fine-grained, calcareous sandstones and sandy limestones with planar and cross-lamination, and brachiopod and gastropod coquinas. A rubbly horizon at the top probably represents a palaeokarst. The second minor cycle is c. 6 m thick and comprises skeletal/ooid grainstone which becomes increasingly sandy, and planar and cross-laminated upwards. It is capped a palaeokarstic surface. The overlying Penderyn Oolite is a pale weathering, sand-free, massive ooid grainstone. The top is not seen in the quarry. It represents minor cycle shoal facies and may represent more than one cycle.







The north face of the quarry exhibits an excellent example of a graben. It is defined by two N/S trending, steeply dipping reverse faults. The throw of the faults is around 2m. The quarry itself is situated in a larger graben defined by a NNW/SSE fault following the col to the east of the quarry and a N/S fault in another col just to the west of the quarry (IGS, 1977). Such faults form part of the S Wales Coalfield cross-fault system.

References:

George, T N. 1927. The Carboniferous Limestone (Avonian) succession of a portion of the north crop of the South Wales Coalfield. *Quarterly Journal of the Geological Society of London*, 83, 38-95.

INSTITUTE OF GEOLOGICAL SCIENCES. 1977. Ammanford. England and Wales. Sheet 230, Solid Geology. 1:50 000. (Ordnance Survey, Southampton for the Institute of Geological Sciences).

SECTION B

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X 
Comment: Quarry floor and all lifts accessible			
Safety:			X 
Comment: Quarry faces need to be examined for stability			
Conservation status: CCW Nature reserve			

OWNERSHIP/PLANNING CONTROL: Owner/tenant: Countryside Council for Wales Planning Authority: Carmarthenshire County Council Planning status/constraints/opportunities: Unknown

CONDITION, USE & MANAGEMENT: Present use: Abandoned quarry used as a nature reserve with open access to the public. Site condition: Quarry faces and floor are fairly free from vegetation. Potential threats: Increasing vegetation could obscure faces. Site Management: Vegetation needs management even though it is part of a nature reserve.

SITE DEVELOPMENT: Potential use (general): Potential use (educational): This is a good site for geological interpretation. Display boards explaining the geology in simple terms could be helpful to non geologist visitors to the nature reserve.
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Other comments:

Photographic Record



Photograph 1. General view of the north face of quarry showing Dowlais Limestone. A graben bounded by two reverse faults is present in the centre of the view.



Photograph 2. First lift on west side of quarry. Thick bedded Dowlais Limestone capped by a palaeokarstic surface, which is overlain by thinner bedded Honeycombed Sandstone.



Photograph 3. Block of Honeycombed Sandstone showing distinctive carious weathering of calcareous sandstone