



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Craig Cynfyn Quarry	File Number: Site_RAW_JRD_31
RIGS Number: 609	Surveyed by: R A Waters and J R Davies
Grid Reference: SO 2716 0302	Date of Visit: 20 th October 2010
RIGS Category: Scientific	Date Registered: Owner: Unknown
Earth Science Category: Stratigraphical, sedimentological	Planning Authority: Torfaen County Borough Council
Site Nature: Disused quarry	Documentation prepared by: R A Waters
Unitary Authority: Torfaen County Borough Council	Documentation last revised: DIS 31 st January 2011
OS 1:50,000 Sheet: 171	Photographic Record: Embedded in text
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: E232	
<p>RIGS Statement of Interest:</p> <p>Craig Cynfyn Quarry forms part of a network of sites that demonstrates the stratigraphy and geological history of the Carboniferous Limestone on the east crop of the South Wales Coalfield. It has been proposed as a RIGS as it a very accessible site that provides an excellent section through the middle part of the Clydach Valley Subgroup that forms the upper part of the Carboniferous Limestone succession on the northern part of the east crop.</p> <p>It exposes a continuous section that is somewhat overgrown in places. However, it is a very important site as the succession is completely dolomitised and shows three previously unrecognised oolitic units. It is therefore key to the understanding of the stratigraphy of the Clydach Valley Subgroup on the east crop. To date the succession in the area is poorly known and little understood, being shown as undivided on British Geological Survey maps.</p> <p>It therefore provides a critical section for researchers to study the completely dolomitised Clydach Valley Subgroup. Furthermore, it is a good section for scientific research on the early dolomitisation of limestones, as a wide range of original limestone types are present. It is not considered suitable for students as some of the faces are too vegetated and the dolomite geology is not easy to demonstrate.</p>	

Geological setting/context:

Craig Cynfyn quarry comprises a northern and a southern bay, separated by a buttress. It offers a continuous section through the lower part of the Carboniferous Limestone on the northern part of the east crop of the South Wales Coalfield. In detail it exposes the middle part of the Couceyan Clydach Valley Subgroup, which is entirely dolomitised in this area (Barclay, 1989). Some 30 m of dolomites punctuated by three units of dolomitised oolitic limestone are exposed.

The lowest beds are only visible in the southern bay of the quarry. The lower 8.5 m comprise thin to medium bedded, fine-grained, medium to dark grey dolomites. Lamination and low amplitude, wave cross-lamination is common, while burrows are locally present. Crinoid ossicles are variably common, either scattered or more rarely as thin lags. Some of the lags have been silicified to give distinctive beds of lenticular chert that weather out of the face; three such beds are seen.

The dolomites are overlain by c. 9 m of dolomitised ooid grainstone and oolitic dolomites. The basal contact is slightly gradational with the underlying dolomites. Some of the ooid cortices are reddened and crinoid debris is locally common.

The top of the dolomitised oolite unit is sharp. Above is c 1.5 m of fine-grained dolomite followed by a metre-thick, distinctive coarsening-upwards unit of medium-grained, oolitic, shelly crinoidal dolomite. A bed of lenticular chert is present at the base. Above the oolite is a fining-upwards sequence, comprising 2.5 m of fine- to very fine-grained dolomites capped by a dolomite mudstone, that forms the first lift of the quarry. Possible cryptalgal lamination is present.

The succession above the first lift is not well exposed now due to vegetation but comprises 3.5 m of fine grained dolomites with *Syringopora* coral colonies and crinoid and shell debris passing up into c 3m of dolomitised oolite. The upper part of the oolite is rubbly and resembles that beneath a palaeokarst.

The lower dolomitised oolite is considered to be the Blaen Onnen Oolite and the underlying dolomite the Pantydarren Formation. Although Barclay (1989) did not recognise oolitic textures he suggested that the crinoidal rich dolomites between the two chert horizons equated with the Blaen Onnen Oolite. Above the Blaen Onnen Oolite, the two further dolomitised oolites that are exposed show features which are dissimilar to the Gilwern Oolite, the youngest of the oolites in the Clydach Valley Subgroup, as neither have erosive bases or are thick enough. Furthermore, the Gilwern Oolite has been mapped to the east of the quarry (Barclay 1989). These oolitic units therefore predate the Gilwern Oolite and are at present unnamed.

Each oolitic unit of the Clydach Valley Subgroup represents a barrier shoal deposit behind which a dolomite unit accumulated. Thus each dolomite/oolite couplet represents a transgressive - progradational (regressive) cycle. Each transgression began with back barrier deposits, followed by deposition of ooid grainstones in a barrier setting. At the high point of the transgression the barrier began to prograde back south, leaving an emergent land surface behind it. Evidence for subaerial exposure is only seen in the quarry in the highest oolite. The shelly, crinoidal dolomite units with tractional structures were deposited in a shelf lagoon subject to storm events as manifested by the crinoidal/shelly lags. The thin unit of dolomite mudstones and very fine-grained dolomites between the two uppermost oolites may be peritidal in origin. Considerably more work is needed to understand the sedimentology of the

dolomite units.

The dolomitisation of the peritidal deposits was probably penecontemporaneous in a tidal flat environment subject to evaporation and/or an influx of fresh water from the land. The remaining dolomites are pervasive and stratabound. They probably reflect the movement of a mixing zone of fresh and marine waters through the host sediment (Hird et al., 1987) to give early dolomitisation of the sediments. The position of the mixing zone would have fluctuated with sea level movements and temporal variations in climate.

References:

BARCLAY, W J. 1989. *Geology of the South Wales Coalfield, Part II, the country around Abergavenny* (Third edition). Memoir of the British Geological Survey, Sheet 232 (England and Wales). (London: HMSO.).

HIRD, K, TUCKER, M E and WATERS R A. 1987. Petrography, geochemistry and origin of Dinantian dolomites from South-east Wales. 359-77 in *European Dinantian environments*. MILLER, J, ADAMS, A E and WRIGHT, V P. (editors). *Geological Journal Special Issue No 12*. (Chichester: John Wiley).

SECTION B

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:			X
Comment: Footpaths lead from B4246 road all round quarry, including top lift.			
Safety:		X	
Comment: Scrambling up scree and buttress necessary to see complete succession.			
Conservation status: Unknown			

OWNERSHIP/PLANNING CONTROL:
Owner/tenant: Unknown
Planning Authority: Torfaen County Borough Council
Planning status/constraints/opportunities: Unknown, but unlikely quarrying will ever recommence

CONDITION, USE & MANAGEMENT:
Present use: Disused quarry with public access via footpaths
Site condition: Quarry floor now extensively covered by small trees and saplings making access to faces difficult in places.
Potential threats: Tree growth may eventually make access to faces locally impossible in places if not checked.
Site Management: Suggest selected parts of site adjacent to faces are cleared of vegetation periodically.

SITE DEVELOPMENT:
Potential use (general):
Potential use (educational): Key site for researchers investigating the stratigraphy and sedimentology of the Clydach Valley Subgroup in the dolomitised east crop of the South Wales Coalfield. Also good site for researching dolomitisation processes.

Other comments

Photographic Record



General view of northern bay of quarry



Northern bay, showing first lift defined by dolomite mudstone and heavily vegetated upper face