South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Cwmynyscoy Quarries West	**File Number:** RAW_JRD_32
RIGS Number: 610	**Surveyed by:** R A Waters and J R Davies
Grid Reference: ST 2820 9950	**Date of Visit:** 20th October 2010
RIGS Category: Scientific, educational	**Date Registered:**
Earth Science Category: Stratigraphical, sedimentological	**Owner:** Torfaen CBC/CCW/Hanson **Planning Authority:** Torfaen County Borough Council
Site Nature: Part disused quarry/local nature reserve, small part is a mothballed quarry	**Documentation prepared by**: R A Waters
Unitary Authority: Torfaen County Borough Council	**Documentation last revised:** 2nd February 2011
OS 1:50,000 Sheet: 171	**Photographic Record:** Attached
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: E249	

RIGS Statement of Interest: Cwmynyscoy Quarries West forms part of a network of sites on the east crop of the South Wales Coalfield that demonstrate the stratigraphy and geological history of the Carboniferous Limestone. It has been proposed as a RIGS as it is an easily accessible site that provides a good section through most of the Clydach Valley Subgroup, which forms the upper part of the Carboniferous Limestone succession in this area. The site is also part of a local nature reserve which is open to the public.

It shows a nearly 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 a key site for understanding the stratigraphy and sedimentology of the Clydach Valley Subgroup on the east crop. To date, the succession in the area is poorly known, being shown as undivided on British Geological Survey maps.

The Cwmynyscoy Quarries West site thus provides a critical section for researchers to study the completely dolomitised Clydach Valley Subgroup. It is also a good section for scientific research on the early dolomitisation of limestones, as a wide range of original limestone types are present.

Geological setting/context:

Cwmynyscoy Quarries West offers a nearly continuous section through the upper part of the Carboniferous Limestone on the northern part of the east crop of the South Wales Coalfield. In detail it exposes most of the Courceyan Clydach Valley Subgroup (Barclay, 1989). Some 50 m of dolomites punctuated by four units of dolomitised oolitic limestone are exposed. Squirrell and Downing (1969) described the quarry but only recorded the lowest oolite.

The lowest part of the succession is seen in a small upper quarry at the south end of the main face. The lowest beds exposed are calculated to be approximately 10 m above the top of the underlying Cwmyniscoy Mudstone at the top of the Avon Group. At the base, the Sychnant Dolomite Formation comprises finely laminated dolomite, siltstone and mudstone with local wave ripple cross-lamination and bioturbation. Packets of sheeted, dolomitised bioclastic packstone/grainstone punctuate the formation. Squirrell and Downing (1969) record a varied brachiopod fauna from these beds. The overlying Pwll-y-Cwm Oolite (5.5 m thick) has a sharp base and top and comprises locally dolomitised ooid grainstone. About 2 m of the overlying Panydarren Formation is seen above and comprises dolomite siltstones and mudstones with replacive chert nodules.

The main (lower) quarry exposes the remaining part of the Panydarren Formation but there is an exposure gap of around 2m between the two quarries. The formation comprises variably bioturbated fine-grained dolomite with planar, wave cross-lamination and possibly hummocky cross-stratification. Scattered lags of coarse crinoidal/oolitic dolomite, commonly replaced by chert are present throughout, increasing in abundance upwards into the overlying Blaen Onnen Oolite. The latter is approximately 9 m thick and comprises cross bedded dolomitised ooid grainstone.

Above a sharp top to the Blaen Onnen Oolite are 3.5 m of fine-grained dolomites with scattered crinoid debris and cherts passing up into a 4.5 m thick oolitic unit. The latter is capped by coarse dolomite overlain by an undulatory palaeokarst and green clay palaeosol. Above the palaeosol are more crioidal fine-grained dolomites punctuated by a 1.5 m dolomitised ooid grainstone.

The oolitic units above the Blaen Onnen Oolite are not like the Gilwern Oolite, the youngest of the oolites in the Clydach Valley Subgroup, as neither have erosive bases or are thick enough. They therefore predate the Gilwern Oolite and are at present unnamed, as are the intervening dolomites. The top of the Clydach Valley Group is probably not seen in the area of the quarry due to overstep at the base of the Namurian, which occurs just to west of the quarry.

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 above the third oolite. The dolomite units with tractional structures were deposited in a back barrier shelf lagoon, subject to storm events as manifested by the crinoidal/oolitic lags. Considerable more work is needed to understand the sedimentology of the dolomite units.

The dolomitisation of the back barrier sediments and the ooid grainstones probably reflects the movement of a mixing zone of fresh and marine waters through the host sediment (Hird et al., 1987). The position of the mixing zone would have fluctuated with sea level movements and temporal variations in climate. Such dolomitisation is thought to have occurred early during diagenesis.

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).

SQUIRRELL, H C, and DOWNING, R A. 1969. Geology of the South Wales Coalfield, Part I, the country around Newport (Mon). 3rd edition. *Memoir of the Geological Survey of Great Britain, Sheet 249 (England and Wales).*

SECTION B

PRACTICAL CONSIDERATIONS:
Please score Accessibility and Safety Red Amber or Green

Accessibility:			X
Comment: Site is a nature reserve open to the public. However, faces are commonly obscured by trees and bushes. A small part at the northern end is a fenced and mothballed quarry with plant.			
Safety:		X	
Comment: Quarry faces need examining for stability. Some faces can only be accessed via a steep scree/debris slope			

Conservation status:

Most of quarry is within the Cwmynyscoy Local Nature Reserve

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Nature reserve -Torfaen CBC and CCW. Mothballed quarry – Hanson Ltd

Planning Authority: Torfaen County Borough Council

Planning status/constraints/opportunities:

Site is currently part of Cwmynyscoy Local Nature Reserve. Mothballed quarry with plant may have permission for some industrial activity.

CONDITION, USE & MANAGEMENT:

Present use: Local Nature Reserve with small part as mothballed quarry with plant.

Site condition: Central part of quarry has been backfilled and landscaped prior to making it a nature reserve. Trees and bushes have grown in a belt adjacent to the main quarry face making access difficult for much of the section.

Potential threats: Increasing vegetation

Site Management: Selected parts of the quarry faces should be cleared of vegetation.

SITE DEVELOPMENT:

Potential use (general):

Potential use (educational): Key site for the scientific study of the stratigraphy and sedimentology of the dolomitised Clydach Valley Subgroup.

Other comments:

Photographic Record

Upper quarry: Thick bedded Pwll-y-Cwm Oolite overlain by thin to medium bedded dolomites of the Pantydarren Formation

General view of main (lower) quarry