



## South Wales RIGS Group Site Record RIGS Description

### SECTION A

General	South Wales
<b>Site Name:</b> Cefn Garw Quarry	<b>File Number:</b> Site_CCC_85
<b>RIGS Number:</b> 635	<b>Surveyed by:</b> South Wales Geologists' Association
<b>Grid Reference:</b> ST 1380 8288	<b>Date of Visit:</b> 4 <sup>th</sup> August 2007
<b>RIGS Category:</b> Scientific, educational	<b>Date Registered:</b> <b>Owner:</b> Unknown <b>Planning Authority:</b> Cardiff County Council
<b>Earth Science Category:</b> Stratigraphical, structural	
<b>Site Nature:</b> Disused Quarry	<b>Documentation prepared by:</b> South Wales Geologists' Association
Unitary Authority: Cardiff County Council	<b>Documentation last revised:</b> DIS 2 <sup>nd</sup> February 2011
<b>OS 1:50,000 Sheet:</b> 171	<b>Photographic Record:</b> Embedded in text
<b>OS 1:25,000 Explorer Sheet:</b> 151	
<b>BGS 1:50,000 Sheet:</b> 249	
<p><b>RIGS Statement of Interest:</b></p> <p>The Cefn Garw Quarry has been proposed as a RIGS on account of its potential as an readily accessible educational site, both for the general public and for students of all abilities.</p> <p>In particular, the exposures demonstrate excellent structures, including a steep anticline on the north side, overthrusting of the Avon Group by thick limestones from the main Pembroke Limestone sequence, a number of other thrusts, and an overturned monocline. The site also preserves changing lithologies, a number of fossiliferous beds, and the potential for student mapping.</p> <p>In addition, the Cwmyniscoy Mudstone Formation (uppermost Avon Group), which only rarely crops out, is well exposed at this site.</p>	

**Geological setting/context:**

This is a large disused quarry with good exposure in the quarry faces. These terraced faces are about 20m high. The Avon Group and the lower part of the overlying Pembroke Limestone Group are exposed (lower part of the Dinantian succession). The overlying Pembroke Limestone Group (formerly the Main Limestone, commonly referred to as the main part of the Carboniferous Limestone) is well exposed in the area. It demonstrates a range of marine carbonate lithologies.

The Carboniferous-Devonian boundary in South Wales is one of dominantly marine Avon Group Limestones and shales overlying continental upper Old Red Sandstone deposits. The marine transgression responsible for this change records a northwards migration of the shoreline onto "St Georges Land" the ancient landmass that occupied most of Wales at the end of the Devonian, prior to this transgression, the southern part of this landmass was drained by southward flowing rivers which deposited mainly sandy alluvium. Detailed sedimentological analysis of these sediments has shown that this early Carboniferous transgression was "pulsed with episodes of rapid sea level rise, punctuated by periods of slower sea-level rise or periods in which barriers prograded and there was periodic emergence" (Davies et al., 1991). Evidence for this transgression is found in the Avon Group and Pembroke Limestone Group, some of which are exposed in Cefn Garw Quarry.

At least two of the three formations in the Avon Group are recognised in the quarry, the Castell Coch Limestone Formation and the Cwmyniscoy Mudstone Formation. The Castell Coch Limestone Formation is described under the Castell Coch Quarry RIGS report. The overlying Cwmyniscoy Mudstone Formation comprises dark grey (marine) mudstones with subordinate thin bioclastic limestones and calcareous siltstones, limestones becoming dominant in the top few metres. It is generally poorly exposed in the area. Its thickness varies from 40m to 60m. The limestones are locally affected by late-stage epigenetic dolomitisation. (Waters and Lawrence 1987).

In Cefn Garw quarry, some excellent structures are exposed in the quarry faces, including a steep anticline on the north side, overthrusting of the Avon Group by thick limestones from the main Pembroke Limestone sequence, a number of other thrusts, and an overturned monocline.

Gayer et al. (1973) provide the following description of structures preserved in the quarry: "Within the quarry, the Cefn Garw Anticline plunges  $17^{\circ}$  to  $262^{\circ}$  and is developed 100m to the north of the Cefn Garw Syncline which plunges  $15^{\circ}$  to  $261^{\circ}$ . In addition, two thrusts are exposed in the quarry; one of these is planar and dips to the north at  $25^{\circ}$  overthrusting massive mineralised dolomitic limestone across the Cefn Garw Anticline and postdating the development of the fold. The thrust itself is truncated by another thrust zone dipping south and over thrusting calcareous shales of Avon Group northwards over banded dolomitic limestones. The second thrust is up to 15m wide and is a combination of several thrust surfaces associated with tight recumbent

folds. The thrust zone is folded and plunges at 15° W and outcrops in each of the working faces of the quarry.”

A number of the beds in the Avon Group are quite fossiliferous. Dolomitization and calcite veining have been reported. Iron staining is also noted.

**References:**

SQUIRELL, H C and DOWNING, R A. 1969. *Geology of the South Wales Coalfield, Part I, the country around Newport (Mon)*, (Third edition). Memoir of the Institute of Geological Sciences Sheet 249 (England and Wales).(London: HMSO)

WATERS, C N, BROWNE, M A E, DEAN, M T and POWELL, J H. 2007. *Lithostratigraphical framework for Carboniferous successions of Great Britain (Onshore)*. British Geological Survey Research Report RR/07/01.

WATERS, R A and LAWRENCE, D J D. 1987. *Geology of the South Wales Coalfield, Part III, the country around Cardiff*, (Third edition), Memoir of the British Geological Survey Sheet 263 (England and Wales). (London:HMSO).

GAYER, R A, ALLEN, K C, BASSETT, M G and EDWARDS, D. 1973. The Structure of the Taff Gorge are, Glamorgan, and the stratigraphy of the Old Red Sandstone – Carboniferous Limestone transition. *Geological Journal*, Vol. 8, 345-374.

DAVIES, J R, MCNESTRY, A, WATESR, R A. 1991 Palaeoenvironments and Palynofacies of a pulsed transgression: the late Devonian and early Dinantian (Lower Carboniferous) rocks of South East Wales. *Geological Journal*, Vol. 128, 355-380.

## SECTION B

### PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

#### Accessibility:



Comment: Probably good access through adjacent works. Permission needs to be sought.

#### Safety:



Comment: Faces need to be examined for stability but likely to be fairly stable.

#### Conservation status:

There are no known conservation designations of this RIGS.

### OWNERSHIP/PLANNING CONTROL:

**Owner/tenant:** Unknown

**Planning Authority:** Cardiff County Council

#### Planning status/constraints/opportunities:

Likely to be standing planning for aggregate extraction. Need to be checked

### CONDITION, USE & MANAGEMENT:

**Present use:** None disused quarry

**Site condition:** Some scrub in quarry bottom and on parts of quarry faces.

**Potential threats:** Quarry could become active again or completely overgrown

**Site Management:** Suggested that parts of this quarry could be cleared of vegetation and rubbish every few years. Former quarry roadways could be enhanced to assist access around this site.

#### Other comments:

### SITE DEVELOPMENT:

**Potential use (general):** Excellent potential for a guided walk around the site for the general public, possibly with sign boards, to introduce them to and demonstrate a range of geological features.

**Potential use (educational):** An excellent resource for educational use, for students of all abilities, to study structures, thrusting, changing lithologies and sedimentary features, fossils, and to undertake mapping exercises. Potential for good parking, access and safety.

## Photographic Record



Cefn Garw quarry, panorama of north side, Avon and Pembroke Limestone Groups



Cefn Garw quarry, panorama of east end



Closer view of structures and lithologies