South Wales RIGS Group Site Record
RIGS Description

SECTION A

General	South Wales
Site Name: Cefn Onn Quarry 2 and 3	**File Number:** Site_RAW_JRD_35
RIGS Number: 612	**Surveyed by:** R A Waters and J R Davies
Grid Reference: ST 1730 8532	**Date of Visit:** 19th October 2010
RIGS Category: Scientific, educational	**Date Registered:**
Earth Science Category: Stratigraphic, sedimentological,	**Owner:** Unknown **Planning Authority:** Caerphilly County Borough Council
Site Nature: two adjacent disused quarries	**Documentation prepared by:** R A Waters
Unitary Authority: Caerphilly County Borough Council	**Documentation last revised:** 22nd February 2012
OS 1:50,000 Sheet: 171	**Photographic Record:** Attached
OS 1:25,000 Explorer Sheet: 151	
BGS 1:50,000 Sheet: 249	

RIGS Statement of Interest:

Cefn Onn Quarry 2 and 3 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 on the east crop of the South Wales Coalfield. It has been proposed as a RIGS as it is an accessible site that provides an excellent exposure for those interested in the stratigraphy, sedimentology and dolomitisation of the middle part of the Pembroke Limestone Group.

In particular it shows one of the few remaining examples of thick Llanelly Formation on the east crop of the South Wales Coalfield, the main exposure, the GCR site at Danygraig (ST 234 908) (Adams et al. 2004), near Risca, having been partly filled in and now completely overgrown. The thick development of Llanelly Formation in Quarry 2 contrasts with the much thinner development on the north crop of the Coalfield in that it lacks the paleosols and paleokarsts. Furthermore, it is one of the formations in this area that has not been studied in detail, yet the quarry provides a key piece of evidence in establishing the geological history of the east crop of the Coalfield during the Arundian stage.

Not only does it offer an excellent locality for those interested in scientific research on the stratigraphy, sedimentology and dolomitisation of the middle part of the Pembroke Limestone Group, it also offers a good site for students to study dolomitised peritidal deposits with relict textures and dolomitised ooltic shoal deposits.

Geological setting/context:

The site comprises two adjacent disused quarries that expose the middle part of the dolomitised Pembroke Limestone Group on the east crop of the Coalfield. It is very accessible being situated adjacent to a public footpath and some 400 m from a Council road. The southern quarry (Quarry 2) exposes the Llanelly Formation which is of Arundian age, while the northern quarry (Quarry 3) exposes the basal part of the overlying Hunts Bay Oolite Subgroup, which is Arundian to Holkerian in age.

Quarry 2

This quarry exposes the upper 20 m of the Llanelly Formation. It was described by Dixey and Sibley (!918) who referred these strata to their lower *Modiola (*or lagoon*)* phase which they recognised as being c. 75 m thick in the Cefn Onn area. Squirrell and Downing (1969) also described the quarry but added little new information as they did not divide the Pembroke Limestone Group (Main Limestone).

In the quarry, the Llanelly Formation comprises interbedded thin to medium bedded grey and grey/green dolomite mudstones and very fine to fine-grained dolomites. The dolomite mudstones are locally shaly and argillaceous and in places finely laminated suggesting they are partly cryptalgal in origin. One bed with vermetid gastropods is present. The very fine to fine-grained dolomites are laminated to cross-laminated and represent dolomitised skeletal and pelloidal wackstones and packstones. The quarry succession is punctuated by several thick beds up to a metre thick of fine to medium-grained dolomite. These have sharp erosive bases, are sparsely crinoidal, locally oolitic and represent dolomitised skeletal/pellodal/oollitic packstones and grainstones.

The Llanelly Formation here is rather different from that on the north crop of the Coalfield in that it is much thicker and paleosols are not abundant. However, it still represents a peritidal, back barrier environment with a restricted fauna that developed behind a major barrier situated some 3 km to the south. The barrier comprises the high energy deposits of the High Tor Limestone seen in the Cardiff area and the thick beds of dolomitised skeletal/pellodal/oollitic packstones and grainstones present in the quarry probably represent washovers and tidal channel deposits. The considerable thickness of the Llanelly Formation in this area is probably the result of continued aggradation during the Arundian stage.

The dolomitisation of the Llanelly Formation perititidal deposits was probably pene - contemporaneous in a tidal flat environment subject to evaporation and/or an influx of fresh water from the land (Hird et al 1987).

Quarry 3

This quarry exposes the basal 14 m of the Hunts Bay Oolite Subgroup overlying the top metre of the Llanelly Formation. The Hunts Bay Oolite Subgroup comprises thick bedded, locally reddened, pale grey coarse-grained dolomite with relict oolitic texture. Crinoid and shelly debris is present in the uppermost beds of the quarry. The basal bed has an erosional base on the underlying dolomite mudstones of the Llanelly Formation and contains intraclasts of dolomite mudstone in the basal few cms. The basal 4 m contains large cavities up to a metre diameter lined with calcite and barytes.

The oolitic dolomites represent high energy shoal deposits and probably records the

basal Holkerian transgression, when a barrier resided between Risca and Pontypool for most of the Holkerian stage.

The coarse-grained dolomites of the Hunts Bay Oolite Subgroup are thought to be the result of late stage 'burial' processes where the dolomitising fluids moved through joints and fissures (Hird et al 1987).

References:

ADAMS, A, WRIGHT, V P and COSSEY, P J. 2004. South Wales – Mendip shelf. 393- 476 *in* British Lower Carboniferous Stratigraphy. Cossey, P J, Adams, A E, Purnell, M A, Whiteley, M J, Whyte, MA, and Wright, V P. (editors). *Geological Conservation Review Series,* No 29. (Peterborough: Joint Nature Conservation Committee).

DIXEY, F and SIBLY, T F. 1918. The Carboniferous Limestone Series on the south-eastern margin of the South Wales coalfield. *Quarterly Journal of the Geological Society of London*, 73, 111-164

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), Memoir IGS sheet 249 (third edition)

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

Accessibility:			X
Comment: Public footpath passes by entrances to both quarries			
Safety:			X
Comment: Quarry 2 is on a gentle slope locally strewn with building rubble and care is needed when accessing faces. In Quarry 3 the faces need examining for stability.			

Conservation status:

Unknown

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Unknown

Planning Authority: Caerphilly County Borough Council

Planning status/constraints/opportunities:

Not known

CONDITION, USE & MANAGEMENT:

Present use: None; disused quarries

Site condition: Quarry 2 is in a wood with some young trees and bushes locally adjacent to faces. Although the floor of Quarry 3 is relatively clear, small trees and bushes have locally obscured some of the faces.

Potential threats: Increasing vegetation obscuring faces.

Site Management: Suggest selected parts of the sites are cleared of vegetation every few years.

SITE DEVELOPMENT:

Potential use (general):

Potential use (educational): Good site for those interested in scientific research on the stratigraphy, sedimentology and dolomitisation of the middle part of the Pembroke Limestone Group. Also good for students to study dolomitised peritidal deposits and dolomitised oolitic shoal deposits.

Other comments:

Photographic Record

General view of Quarry 2 showing Llanelly Formation

Quarry 2. Llanelly Formation: Medium bedded blocky dolomite mudstones with shaly partings

Quarry 3: Thick bedded coarse-grained dolomites of the Hunts Bay Oolite Subgroup