



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Llanhilleth (Tirpentwys)	File Number: Site_BIGC_11
RIGS Number: 589	Surveyed by: Rhian Kendall, David Roberts
Grid Reference: SO 2340 0140	Date of Visit: 30 th September 2010
RIGS Category: Scientific	Date Registered:
Earth Science Category: Stratigraphic, sedimentological	Owner: Unknown Planning Authority: Torfaen County Borough Council and Caerphilly County Borough Council
Site Nature: Disused Quarry	Documentation prepared by: Rhian Kendall
Unitary Authority: Torfaen County Borough Council and Caerphilly County Borough Council	Documentation last revised: 24 th March 2012
OS 1:50,000 Sheet: 171	Photographic Record: Embedded in text
OS 1:25,000 Explorer Sheet: 152	
BGS 1:50,000 Sheet: 232/249	
RIGS Statement of Interest:	
<p>This site has been proposed as a RIGS as it is a good example of the Grovesend Formation of the Warwickshire Group in South Wales. It provides over 1km of exposure between the Mynnydd Islwyn and Small Rider Coals, providing opportunity to study this formation and the sedimentology of sediments deposited on alluvial floodplains in overbank lake environments. This site would also be of interest to engineering geology students.</p> <p>This site is however dangerous to access at present due to loose overhanging faces and work would need to be done to make the site safe before any studies could be made.</p>	

Geological setting/context:

The Grovesend Formation is the youngest of the Carboniferous units exposed in the South Wales Coalfield. The Formation is typically argillaceous, being made up of Mudstones and siltstones with lithic sandstone layers of Pennant Sandstone type, which can be locally thick. This formation does contain coals although they are not typically thick or economically important in the past. (Waters et al 2009) "The Grovesend Formation was deposited on alluvial floodplains in an overbank lacustrine environment." (Waters et al 2007)

The distribution of the Grovesend Formation is restricted to small areas within the coalfield where it is preserved in faulted blocks and the cores of synclines

The Llanhilleth disused opencast site exposed the Grovesend Formation between the Mynnydd Islwyn and Small Rider Coal seams. BGS, in 1969, described a section of Small Rider Measures:

- 1.2m Mudstone with plants
- 1.95m Sandstone
- 0.42m Rashings, inferior Coal in the Middle
- 0.47m Seat Earth
- 1.45m Silty sandstone with roots
- 1.44m Mudstones with plants seat earth above
- 0.16m Coal
- >1.52m Seat Earth

The following section was described near the central road that runs north south through the site:

Continuous exposure in opencast backwall:

- 8m Sandstone, erosive base
- 0.3m Rashings
- 2.33m Seat-earth, silty below
- 1.85m Silty Mudstones
- 0.28m Sandstone, fissile
- 0.02m Clay
- 0.39m Coal
- 0.46m Seat Earth
- 4.2m gap
- 19m Well bedded sandstone
- 0-0.75m Mudstone
- 0.36m Grey shales containing Leacia
- 1.83m Barren mudstone
- 0.09m Grey shales containing Leacia
- 0.38m Mudstones with macerated plants
- >0.98m Coal

This section thought the Grovesend Formation is thought to be the longest continuous exposure of rocks of this in this part of the South Wales coalfield, at over 1km long. It is also important as other good outcrops of this formation are in the South of the

coalfield. The Grovesend Beds at this site are dominantly sandstones and are well bedded and with strong cross beds, all of which is heavily cut by systematic sub vertical joint sets. The rock splits easily along the bedding and is micaceous. The dip is not easy to determine but remote generalised measurements suggest a dip of about 10 degrees on a bearing of 240 degrees. This is out of the rock face which will add to the degree of instability. At the eastern end of the site the base of the sandstones is seen to overly a black fissile shale where the dip can be determined on a highly uneven sandstone base as about horizontal. The large cross beds give an impression that the dip is into the rock face. It would be dangerous to collect data or samples from the rock face in its present condition. The main danger is from toppling failure of the rock face especially where sub vertical joints which dip steeply into the rock face have opened and large blocks are now in a very unstable condition.

This site is extremely dangerous with many overhanging, unstable faces and should only be accessed by professional geologists and ground engineers who would need to evaluate how to make the faces safe if any studies are to be made in it. All investigations of the faces should be undertaken remotely with the use of binoculars.

The pool at the base of the face is deep enough to drown in and the edges are treacherous with loose, moss covered rocks and a very soft base. A narrow path across the old tip area makes easier access though the site but this too has its potential dangers because loose sandstone blocks are becoming liberated from the more easily eroded shale. Above the tip area to the south is a mature pine forest which screens the site from the road. These trees are gradually colonising the rest of the site as well as a variety of deciduous species many of which are rooted in joints on the rock face.

Before any research work is undertaken at this locality it must be made safe.

Development of this site for aggregate extraction could provide an opportunity, in consultation with operators for a safer environment to which examine the Grovesend Formation. Operators should be encouraged, in their plans to make good after extraction, to leave safe faces for further study.

References:

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)

WATERS, C N, WATERS, R A, BARCLAY, W J, and DAVIES, J R. 2009. A lithostratigraphical framework for the Carboniferous successions of southern Great Britain (Onshore). British Geological Survey Research Report, RR/09/01.

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.

PRACTICAL CONSIDERATIONS: Please score Accessibility and Safety Red Amber or Green			
Accessibility:	x		
Comment: See site description			
Safety:	x		
Comment: See site description			
Conservation status: There are no known conservation designations of this RIGS			

OWNERSHIP/PLANNING CONTROL: Owner/tenant: Unknown Planning Authority: Torfaen County Borough Council and Caerphilly County Borough Council Planning status/constraints/opportunities: It is understood that this has been an application to extract aggregate at this site at the time of writing.
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CONDITION, USE & MANAGEMENT: Present use: Site condition: Disused quarry Potential threats: The site is presently dangerous and may be filled in Site Management: This site is dangerous at present to access and so it is recommended that faces be made safe and kept clear of vegetation to allow safe access to the faces. It is also advised that any extraction of aggregate from this site be done so with a mind to leave some faces that maintain access to the interest in this quarry, ie the Grovesend Formation.
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SITE DEVELOPMENT: Potential use (general): Potential use (educational): The site could be used by geology students, studying the Grovesend Formation and/or sedimentology.

Other comments:

Photographic Record



View from access. Photograph by David Roberts



Bedded sandstone, joints and debris at west end. Photograph by David Roberts



Bedded sandstone with many joints at west end. Photograph by David Roberts



Toppling in Sandstone. Photograph by David Roberts



View of site from west showing lake, trees, the difficult access and working conditions. Photograph by David Roberts



Base of sandstone overlying shales. Photograph by David Roberts



Unstable face with suspended block (E side). Photograph by David Roberts



East end of face showing very poor stability of vertical faces, strong master joints, a higher level bench which is not accessible safely and wrecked cars on the floor. Photograph by David Roberts



Poor face stability and toppling. Photograph by David Roberts



View to west showing base of sandstone. Photograph by David Roberts



Sandstones at east showing dangerous faces. Photograph by David Roberts



Sandstones at east showing dangerous faces. Photograph by David Roberts



Unstable east end of site showing loose blocks and evidence of recent collapse.
Photograph by David Roberts



View of lake to east. Photograph by David Roberts



View of water to west. Photograph by David Roberts



Sandstone in tip. Photograph by David Roberts



Sandstone at west end of site. Photograph by David Roberts