



South Wales RIGS Group Site Record

RIGS Description

SECTION A

General	South Wales
Site Name: Llandaff Weir	File Number: SITE_SWGA_CCC_358
RIGS Number: 658	Surveyed by: South Wales Geologists' Association
Grid Reference: ST 1525 7845	Date of Visit: 30 th March 2009
RIGS Category: Scientific, Educational	Date Registered:
Earth Science Category: Sedimentological, Stratigraphical	Owner: Cardiff County Council Planning Authority: Cardiff County Council
Site Nature: River bank exposure	Documentation prepared by: Rhian Kendall
Unitary Authority: Cardiff County Council	Documentation last revised: 3 rd June 2009
OS 1:50,000 Sheet: 171	Photographic Record: Attached
OS 1:25,000 Explorer Sheet: 151	
BGS 1:50,000 Sheet: 263	
RIGS Statement of Interest: Llandaff Weir has been suggested as a RIGS because it forms part of a network of sites across Cardiff that show the variations in the Triassic Mercia Mudstone group. At this site, the conglomeratic marginal rocks grade to red mud stones, the other rock type of this age in the area. The red rocks representing an arid landscape with flooding rivers depositing fine grained sediments on its flood plains. The conglomerates show the inundation of this landscape by the sea that was flooding the land at this time. This site also, potentially exposes an unconformity between the Triassic rocks above and Silurian aged, Old Red Sandstone mudstones beneath. This is previously unrecorded at this site This site is especially useful as it is very accessible for study both by schools and by researchers.	

Geological setting/context:

The Llandaff Weir site exposes Silurian aged mudstones in periods of drought, overlain with unconformity by Triassic Breccias of the Mercia Mudstone Group Marginal Facies. The site also shows a modern river gravel/overbank deposit of the River Taff.

In the district of Cardiff, the Lower Old Red Sandstone (possibly Raglan Mudstone) is up to 300m thick and is made up of red mudstones with calcretes and subordinate sandstones. It outcrops to the north of the Cardiff but is only poorly exposed in the south, making this locality important to understanding this group in the southern part of the county where it is only known in boreholes. These sediments are interpreted as alluvial flood plain deposits.

Triassic sedimentation in the Cardiff district was governed by Triassic landscape which was dominated by the effects of the erosion of the Cardiff-Cowbridge Anticline. The Carboniferous limestone and Upper Old Red Sandstone units on the two limbs of the fold formed major ridges with the softer Lower Old Red Sandstone being easily eroded along its axis to form a south eastward trending basin which connected with the main Triassic Basin.

Only Late Triassic deposits are preserved in the Cardiff District. These are made up of up to 200m of lacustrine and continental deposits, comprising the Mercia Mudstone Group which progressively onlap the irregular Triassic topography. Towards the end of the Triassic, there was a change to marine conditions, continuing the onlap. This marine sequence is up to 12m thick and is known as the Penarth Group and is made up of mudstones with thin limestones.

The thickest accumulations of the Mercia Mudstone Group are to be found in Cardiff where it includes an argillaceous facies and a contrasting heterogeneous marginal facies. The argillaceous facies is made up of red mudstones, representing a lake or inland sea deposit. The marginal facies is made up of breccias, conglomerates, sandstones, siltstones, mudstones, evaporites, calcretes, limestones and dolomites. These rocks represent continental and shoreline or continental scree and alluvial fans and plains deposits.

Ref: Waters and Lawrence 1987

The Llandaff Weir proposed RIGS is an area of river bank, exposed in the North bank of the River Taff, adjacent to the weir at Llandaff North.

This site exposes rocks, mainly of Triassic (Mercia Mudstone Group) age with Silurian (Raglan Mudstone Group) aged rocks visible at the base of the section. This is especially apparent in time of low water and is previously unknown from this locality however, BGS in their 1:10,000 maps acknowledge Raglan Group deposits, seen in the past at low water from the centre of the River. This area is now under gravel banks.

There are approximately 3m of rock exposed, capped by 1.5m of river cobbles and approx 6m of soil and vegetation.

The lowest unit, of approx 1m thickness comprises Lower Old Red Sandstone rocks. These are red mudstones, with green reduction lines, The mudstone contains abundant calcrete nodules. There are possibly two distinct layers of nodules where nodules are more common. The nodules are randomly orientated at up to approx 15cm in diameter. Variably coloured in fresh surface: mottles cream, purple and dark brown or greens and reds of the rest of the formation. One example contained tiny spheres.

Overlying the Lower Old Red Sandstone rocks are Triassic aged sediments of the Mercia Mudstone Group (Marginal Facies). The lowermost 0.7m is comprised of red conglomerate in a fining upwards sequence. The conglomerate contains clasts of Carboniferous Limestone that are predominantly Grey-red in colour and sub-rounded and they vary in size from 1mm up to 10cm.

Overlying the conglomerate beds are approximately 1m of more finely bedded sandstones. These are red-brown in colour, fining upwards (Clasts are up to 2m in the lower parts of this unit). Some beds are finely laminated.

Modern sediments complete the sequence with approx 0.6m of brown muds, containing well rounded clasts at towards the top, overlain by predominantly loose well rounded cobbles ranging in size from approximately 40 cm to almost 1m in places. Approx 6m of soil with tree roots completes the sequence.

In contrast to other locations in Cardiff that expose Mercia Mudstone Group, this location shows a greater variety of lithologies within a small area.

Strata dips approx 10° N

References:

WATERS, R A and LAWRANCE, DJD. 1987. Geology of the South Wales Coalfield, Part III, the country around Cardiff. BGS

SECTION B

PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

Accessibility:



Comment: Easy parking and access via Gabalfa Rd or River View. Wellies are recommended

Safety:



Access can be a little slippery in wet weather and site is in bank of river so access could be more difficult in wet weather. Also, youngsters should be supervised because of the proximity to the water.

Conservation status:

There are no known conservation designations of this RIGS.

OWNERSHIP/PLANNING CONTROL:

Owner/tenant: Cardiff County Council

Planning Authority: Cardiff County Council

Planning status/constraints/opportunities:

There are no known planning constraints or opportunities

CONDITION, USE & MANAGEMENT:

Present use: None. "Natural" (modified in places as river defences) River bank

Site condition: Good.

Potential threats: Improvements in river defences could remove the interest in this site

Site Management: Suggest that site is kept clear of little deposited by river.

SITE DEVELOPMENT:

Potential use (general): Site is useful to illustrate the variability in lithologies within the Mercia Mudstone Group, Marginal Facies. It is also a good example of an unconformity.

Potential use (educational): Site is easily accessible and safe given precautions that should be taken near water. It would make a good teaching site as it displays a range of characteristics of the Mercia Mudstone Group.

Other comments:

Photographic Record



General View of site. North Bank of River Taff looking east



View of succession



Raglan Group Mudstones Showing calcrete nodules and palaeosol development



Raglan Group Mudstones showing irregular calcrete nodules close to the unconformity with the Triassic Mercia Mudstone (Marginal Facies)



Unconformity between Raglan Group Mudstones and Triassic Mercia Conglomerates base of hammer is at the unconformity. Head of hammer at top of coarser conglomeratic beds described in the text.



Unconformity between Raglan Group Mudstones and Triassic conglomerates.



River worn pebbles in bank.