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# Penllergaer Railway Cutting

## Highlights

This is the best available exposure of the Grovesend Formation in South Wales, representing a time of reduced sediment input in this part of the coalfield (Figure 4.25).

## Introduction

The Grovesend Formation in South Wales consists mainly of argillaceous rocks and is consequently poorly exposed. One of the few available outcrops is in this railway cutting on the Port Talbot–Llanelli loop-line, about 1.5 km north-east of Penllergaer, near Swansea, West Glamorgan, Wales [SS 619 999]–[SS 624 997]. It has been briefly described by Archer *in* Owen (1971d).

## Description

### Lithostratigraphy

Exposed here are 22 m of mainly grey mudstones and siltstones. Also present are two coals, the Little Loughor Seam (0.5 m thick) and Penyscallen Seam (0.4 m thick). A few centimetres above each coal is a thin lacustrine mudstone with abundant non-marine bivalves and estheriids. This is typical of the Grovesend Formation in central part of the coalfield, except for the absence of red beds.

### Biostratigraphy

This site yields very little biostratigraphical data. The non-marine bivalves appear to belong to the *Anthraconauta tenuis* Zone, but this only indicates a position anywhere between the upper Bolsovian and Cantabrian. However, shales above the Penyscallen Seam, exposed in a colliery at nearby Gorseinon, have yielded a diverse assemblage of plant fossils, which clearly belongs to the *Lobatopteris vestita* Zone (Cleal, 1978). This is an index for the upper Westphalian D in South Wales.

## Interpretation

The Grovesend Formation, as exemplified by the Penllergaer sequence, is a set of flood-plain deposits, which contrast with the underlying Pennant Formation deposits that are mainly arenaceous, fluvial deposits (Kelling, 1974). These finer-grained deposits were formed at a time of reduced sediment-input from the southerly lying landmass (Sabrina *sensu* Kelling, 1974), allowing more stable flood-plain conditions to develop. The presence of estheriid bands suggests that there were periodic intervals when lacustrine conditions prevailed.

This contrasts with the situation in the southeastern part of the coalfield, where arenaceous, fluvial deposits persist through to the top of the Westphalian D, in the form of the Forest of Dean Pennant Formation (Cleal, 1992). These sediments were derived from a different source, probably lying somewhere to the south-east, which seems to have remained active for some time after the Sabrina source.

Similar flood-plain deposits to the Grovesend Formation occur elsewhere in the upper part of the Coal Measures in southern Britain (i.e. south of the Wales–Brabant Barrier). In the Forest of Dean, they are known as the Suprapennant Formation (see Chapter 5), while in the Bristol–Somerset Coalfield they are known locally as the Farrington, Barren Red, Radstock and Publow formations (Kellaway, 1970). They also occur in the concealed Severn Coalfield (Cleal, 1986a). However, they almost certainly represent relatively localized deposits, and are not lateral equivalents in anything other than facies development. For this reason, they are given separate formational designations.

## Conclusions

Penllergaer Railway Cutting is the best exposure of the upper beds in the South Wales Coalfield, known as the Grovesend Formation, about 300 million years old. They consist mainly of mudstones and shales, and are quite different from the beds lower in the sequence, which are mainly coarse sandstones of the South Wales Pennant Formation. It marks the end of the input of large quantities of sandy sediment into this part of the coalfield, probably reflecting reduced erosion in the hinterland areas to the south.

## [References](#)



*(Figure 4.25) Penllergaer Railway Cutting exposing part of the Grovesend Formation. (Photo: C.J. Cleal.)*