# South Wales RIGS Group Site Record
## RIGS Description

**SECTION A**

| General | South Wales |
|---|---|
| **Site Name:** Penarth-Lavernock RIGS | **File Number:** Site_RS_9 |
| **RIGS Number:** 672 | **Surveyed by:** Helen Kerby |
| **Grid Reference:** ST 1880 6999 | **Date of Visit:** 2009 |
| **RIGS Category:** Scientific, educational | **Date Registered:**<br><br>**Owner:** Unknown |
| **Earth Science Category:** Mineral | **Planning Authority:** Vale of Glamorgan Council |
| **Site Nature:** Foreshore and cliffs | **Documentation prepared by:** Helen Kerby |
| **Unitary Authority:** Vale of Glamorgan Council | **Documentation last revised:** 28th February 2012 |
| **OS 1:50,000 Sheet:** 171 | **Photographic Record:** Attached |
| **OS 1:25,000 Explorer Sheet:** 151 | |
| **BGS 1:50,000 Sheet:** E263 | |

**RIGS Statement of Interest**:
This area of coastline is proposed as a RIGS as it contains one of the few known areas of Strontianite mineralisation in South Wales (and the best known in Wales) and blue celestine crystals from this area are the finest in Wales. The Strontium, Copper, and possible Uranium mineralogy of the area have many features that are of interest to those researching the mineralization of the region.

The coastline has excellent exposure and is easily accessible. Along with the other sedimentological and geomorphological features such as faulting it provides an excellent educational location to introduce the transgression from Triassic to Jurassic rocks, not available elsewhere in South Wales. Any site visit can cover a broad range of topics from mineralogy and sedimentology to structural geology, stratigraphy and industry.

The striking pink and white alabaster has been used historically for several buildings in South Wales, and the cliffs have featured in many paintings and pictures and though subject to constant erosion could be said to have some iconic status.

**Geological setting/context**:

The coast exposes a series of sedimentary rocks from the Triassic to the Lower Jurassic. Triassic Mercia Mudstones lie at the lowest point in the sequence and alternate between green and red mudstones. They transition into alternating limestones, thin phosphatic sandstones ('bone beds') and black pyritic paper-shales of Rheatic age. These in turn are overlain by Lower Lias strata, consisting of alternating mudstones and impure limestones. The sequence is flat-lying or gently dipping, although it is locally disturbed by faulting.

Mineralisation ranges from copper-bearing evaporites in the mudstones, through vein celestine and strontianite deposits in the Rhaetic nodular limestones to celestine occurring within Liassic fossils. The strontium mineralisation, which is probably related to the Bristol Sr orefield, is of regional significance and has produced occasional fine blue celestine samples.

The strontianite can be found in a dark nodular limestone, in particular in loose boulders on the beach in front of the cliff at ST18677027. The source bed is thought to be a dark nodular Rheatic limestone visible in the cliff above. Much of the bed is covered by debris due to the concrete sea defences, but where it is exposed more strontianite-rich nodules can be found on the shore . Celestine also occurs in the nodules, though the deep blue crystals known to have been found here may only be found again if new rock falls expose them. The strontianite filled nautiloid fossil in the National Museum of Wales from Lavernock point contains a larger amount of the mineral, though less crystalline, than found so far in the nodular specimens. Better specimens may be found at this location in the future.

The gypsum occurs as nodular bands in several horizons in the Mercia Mudstones. The striking pink colour (due to iron) of much of it has lead to it being used for monumental purposes, though it is of very low quality compared to gypsum deposits in England. Of more interest mineralogicaly is the presence of the copper bearing mineral malachite, usually as small crusts on the gypsum. The source of the copper has never been investigated, and along with recent finds of Cu minerals on Sully Island, is an area worthy of more research.

**References**:

BEVINS, R E & MASON, J S. 2000. Welsh Metallophyte and metallogenic evaluation project: Results of a Minesite Survey of Glamorgan and Gwent. National Museums & Galleries of Wales, Cardiff

Welsh Stone Forum. 2004. Newsletter 2 at www.museumwales.ac.uk/en/welshstoneforum/newletters/

BGS Memoir 263. 1912.Geology of the South Wales Coalfield, Vol. III Cardiff

http://www.museumwales.ac.uk/en/mineralogy_of_wales/

**SECTION B**

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

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|---|---|---|---|
| **Accessibility**: | | | X |
| Comment: Easily accessible from several locations via public paths | | | |
| **Safety**: | | X | |
| Comment: Constant cliff falls, and danger of stranding at high tide. | | | |

**Conservation status**:

There are no known conservation designations of this RIGS

**OWNERSHIP/PLANNING CONTROL**:

**Owner/tenant**: Unknown

**Planning Authority**: Vale of Glamorgan Council

**Planning status/constraints/opportunities**:

There are no known planning constraints or opportunities

**CONDITION, USE & MANAGEMENT**:

**Present use**:

**Site condition**: Much of the area exposed by constant erosion from the sea.

There is a build up of debris in some locations, particularly where sea defences exist. however, the site is constantly changing.

**Potential threats**: More sea defences will alter the erosion and may expose or cover up features.

**Site Management**:

**SITE DEVELOPMENT**:

**Potential use (general)**:

An excellent site for researching the origins of strontium in South Wales.

**Potential use (educational)**: Excellent site for an introduction to many geological features, especially the Triassic to Jurassic transgression. The best site in Wales for studying strontium-bearing minerals.

**Other comments**:

**Photographic Record**

Location of Strontianite nodules at end of sea defences at ST18677027

and second exposure above the wall at ST18677027

Typical dark grey nodules.

Typical small strontianite clusters. Scale bar division is 10mm

An example of interesting intergrowths not yet researched- celestine (blue) and gypsum (pink)