

# Hydrogeology of Wales: Quaternary aquifers - Whiteford Sands

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[Jump to navigation](#) [Jump to search](#)

**This page is part of a category of pages that provides an updated review of the occurrence of groundwater throughout Wales.**

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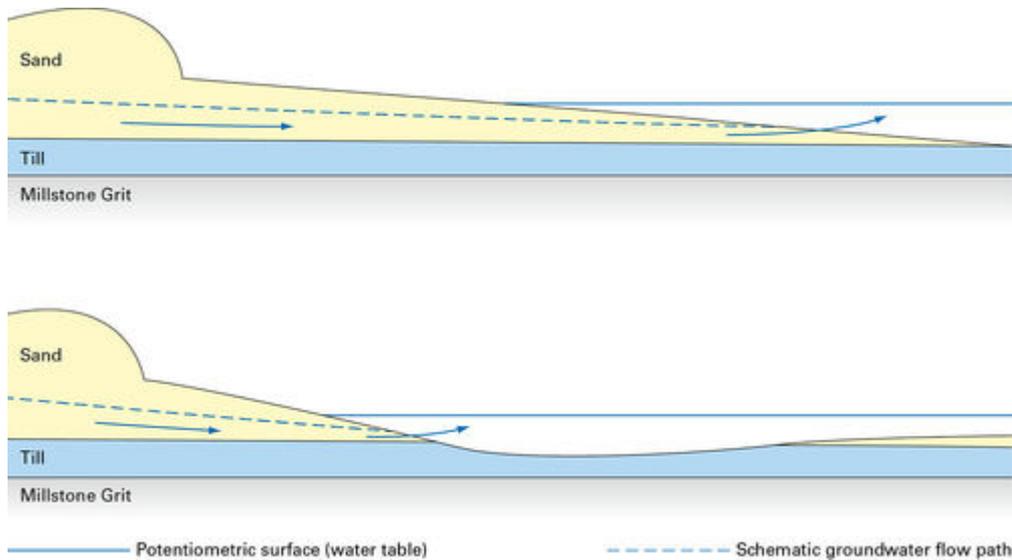


Groundwater discharge along the foreshore beneath Whiteford Burrows on the Gower Peninsula. P802434.

Whiteford Sands is a blown sand spit over glacial till (**Plate P802434**). The fore-dunes give way to beach sands and the back of the dunes to the east, to clays and silts of tidal flat deposits. The sand rests on till deposited beneath a Quaternary ice sheet. Steep northerly dipping Carboniferous Limestone strata abut the sand at the landward (southern) edge, although the Millstone Grit succession underlies the majority of the burrows area. It is unlikely that groundwater in the Carboniferous Limestone can ingress the sands due to the steep bedding of the limestone, in which dilated bedding plains will tend to drain to the base of the upstanding outcrop.

The sand acts as a small unconfined aquifer perched over impermeable till. Water contained in the sand derives solely from direct rainfall recharge. The groundwater stored in the sands discharges naturally to the foreshore while a small amount discharges to the salt marshes behind the dunes. There are no external contributions to the water balance although standing water on the shore side of the burrows does enhance evaporative losses from this area.

The groundwater flow regime at Whiteford comprises a groundwater dome created by direct rainfall recharge with discharge to the foreshore. However, it has been heavily impacted by change when storm ingress and erosion of the foreshore took place in 1996 increasing the hydraulic gradient away from the dune front with a corresponding increase in discharge from the dunes ([Stratford et al., 2009](#)). The consequent lowering of the water table virtually overnight is only now slowly beginning to recover (**Figure P859285**).



Schematic cross section of the central foreshore at Whiteford Sands showing the steepening of the hydraulic gradient away from the dune front following storm damage in 1966. P859285.

## Hydrogeology of Wales - contents

[Summary](#)

[Acknowledgements](#)

[Introduction](#)

[Geology and Groundwater](#)

[Topography, climate, land use and natural resources](#)

[Groundwater regulation](#)

[Issues](#)

[Precambrian and Cambrian](#)

[Groundwater occurrence in the Precambrian and Monian Supergroup](#)

[Groundwater occurrence in the Cambrian](#)

[Ordovician and Silurian](#)

[Groundwater occurrences](#)

[Groundwater studies](#)

[Groundwater chemistry](#)

[The Old Red Sandstone](#)

[Groundwater occurrences](#)

[Groundwater chemistry](#)

[Carboniferous](#)

[Carboniferous Limestone](#)

[Marros Group](#)

[Modelling the South Wales Coalfield](#)

[Coal Measures facies](#)

[Groundwater quality in the South Wales Coalfield](#)

[Permo-Triassic and Jurassic](#)

[Vale of Clwyd](#)

[Cheshire Basin, Dee catchment](#)

[South Wales](#)

[Quaternary aquifers](#)

[Groundwater occurrences](#)

[Afon Teifi](#)

[Upper Lugg catchment](#)

[Afon Cynffig coastal plain](#)

[Whiteford Sands](#)

[Newborough Warren](#)

[Management and regulation of groundwater](#)

[Groundwater abstraction](#)

[Need for management](#)

[Groundwater pollution](#)

[Management tools and future issues](#)

## [References](#)

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[Category](#):

- [Hydrogeology of Wales](#)

## Navigation menu

### Personal tools

- Not logged in
- [Talk](#)
- [Contributions](#)
- [Log in](#)
- [Request account](#)

### Namespaces

- [Page](#)
- [Discussion](#)

### Variants

### Views

- [Read](#)
- [View source](#)
- [View history](#)
- [PDF Export](#)

### More

### Search

## Navigation

- [Main page](#)
- [Recent changes](#)
- [Random page](#)
- [Help about MediaWiki](#)

## Tools

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)
- [Cite this page](#)
- [Browse properties](#)

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- [Privacy policy](#)
- [About Earthwise](#)
- [Disclaimers](#)

