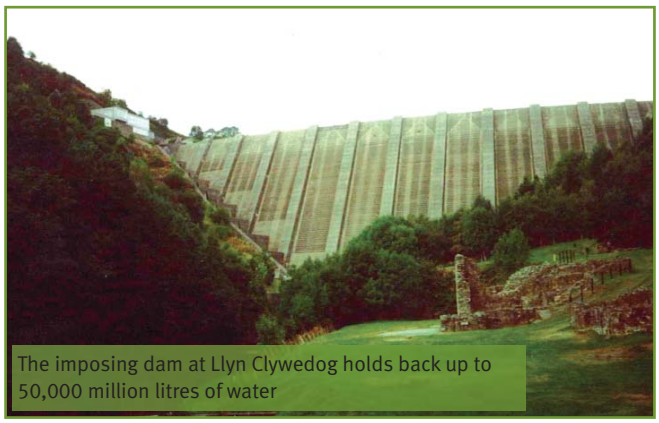
RIVER SEVERN

Regulation fact sheet 2

Environment Agency

Llyn Clywedog & Lake Vyrnwy

Llyn Clywedog and Lake Vyrnwy are artificial reservoirs built on tributaries of the River Severn. Clywedog was built specifically for River Severn Regulation use to support demands for use of river water. Vyrnwy is mainly a water supply reservoir used by United Utilities to supply water to Liverpool, with some water available for river regulation. Both are owned by Severn Trent Water Ltd. The water released from the reservoirs into the River Severn is managed by the Environment Agency working with the water company.



The imposing dam at Llyn Clywedog holds back up to 50,000 million litres of water

Llyn Clywedog

The dam across the River Clywedog near Bryntail is one of Britain's tallest concrete buttress dams. It was built specifically to hold water to be used for River Severn Regulation as a result of an Act of Parliament in 1963. The Act was based on a survey that stated the amount of water that would be needed to support river flows and the most suitable location for the reservoir to store that water.

The location was chosen to take advantage of the high rainfall in the Welsh Hills. It is not uncommon for nearly 2000 millimetres of rain to fall here in a year. This rainfall is stored and released from the reservoir to support the River Severn when required. This is usually during dry weather when the demand for water is high and natural river flows are low.

The dam took three years to build, starting in April 1964. The reservoir began to fill in December 1966 and was full by 1968. It is situated five kilometres upstream from the confluence of the River Clywedog with the River Severn.

Whilst the building work took place, the river was diverted away from the site so that the foundations could be kept dry. Water is released from the reservoir using a number of valves of different sizes. These valves allow accurate control of the output. They are powered using hydro-electric power generated at the dam and are operated from a control building next to the dam. If additional electricity is produced by the discharges of water, it can be sold.

During the winter months, the reservoir is drawn down sufficiently to allow for winter rainfall to be stored. But, if rainfall amounts are high, the reservoir will overspill. This storage can lessen the impacts of flooding on the River Clywedog but has a negligible effect on flooding on the River Severn. This is because many other tributaries join the River Severn in its upstream reaches so the influence of the River Clywedog is minor at high flows.

	Clywedog	Vyrnwy
Area	250 hectares	454 hectares
Length	9.5 kilometres	7.6 kilometres
Capacity	50,000 million litres	59,666 million litres
Dam height	72 metres	43.9 metres
Max. depth	66 metres	25.6 metres

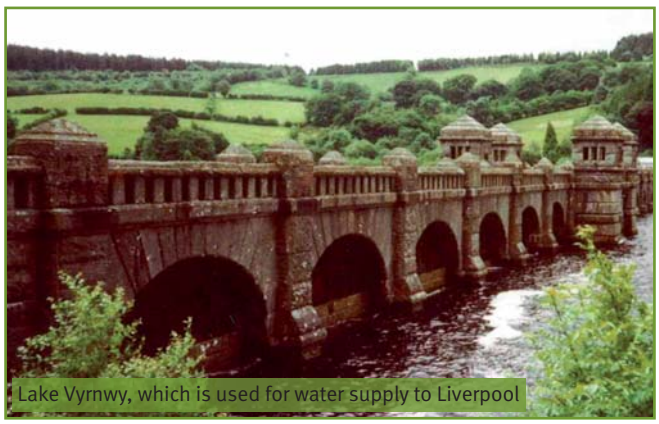
This table compares some of the main details of Llyn Clywedog & Lake Vyrnwy

The reservoir is managed to ensure that it is full in time for summer. A small release is made throughout the year to prevent the River Clywedog from drying up. Larger releases are then made for river regulation or flood drawdown. Much use is made of the reservoir for recreation, with a sailing club and an angling club leasing rights to use the lake. The area is now an important wildlife habitat and a scenic trail is signposted along with other footpaths in the area.

Environment Agency

Lake Vyrnwy

Lake Vyrnwy was created by building a dam near the headwaters of the River Vyrnwy. The River Vyrnwy joins the Severn at Melverley. An Act of Parliament passed in 1880 allowed the reservoir to be created to provide a water supply to Liverpool. When the reservoir was formed, a village in the valley was flooded and the villagers were provided with new housing nearby. It was the first large masonry dam to be built in Britain and at the time it created the largest artificial reservoir in Europe. The dam was built between 1881 and 1888 and had been filled with water by 1889.



Lake Vyrnwy, which is used for water supply to Liverpool

Like Llyn Clywedog, the location for Lake Vyrnwy was chosen because of the high rainfall in the area. The main purpose for the creation of Lake Vyrnwy was to provide a plentiful, clean water supply to Liverpool. An aqueduct takes the water from the lake to treatment plants in the north west. A minor proportion of the water stored in Lake Vyrnwy can be used to support River Severn Regulation.

Since the creation of the lake, most of the surrounding area has now been forested and is an important wildlife reserve. While recreational use of the reservoir is restricted to preserve the quality of the drinking water supply, bird hides and wildlife trails attract many visitors to the lake.

Other sources of water

In the 1970s, it was realised that the combined output of Llyn Clywedog and Lake Vyrnwy alone would not be sufficient to support the River Severn in dry weather. This was because of increased demands for water use from the River Severn and a number of extremely dry summers, for example, the severe drought of 1976. The search for an additional supply of water began and an alternative to another surface water reservoir was promoted. The Shropshire Groundwater Scheme was developed. A number of boreholes were drilled and the water pumped from them can be piped into the River Severn if required. More information about the Shropshire Groundwater Scheme can be found on the 'Introduction to the Shropshire Groundwater Scheme' factsheet in this series. This scheme is managed in conjunction with Llyn Clywedog and Lake Vyrnwy to ensure that flows on the River Severn are maintained.

Fact box 2

Reservoirs: These are formed when either a dam is built across a river or the flow is diverted into a storage area. They are a means by which water can be stored for future use.

River flow: This is the movement of water draining from the land out to the sea in river channels. The flow is made up of rainfall draining into the channel baseflow, which is supported in many cases by groundwater and releases of waste water.

Aqueducts: These are like pipelines because they are used to transport water from one place to another. Aqueducts are built above ground, often like bridges, and carry water in a channel rather than a pipe.

Groundwater: This is water that is found below the ground in cracks and spaces in the rocks and soil. Groundwater could be seen as a naturally occurring, underground reservoir.