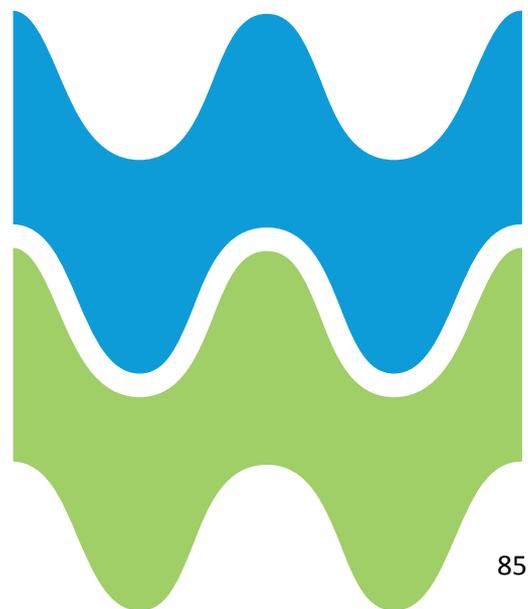


Draft

Drought Plan 2020:

Annex 1j – South  
Meirionnydd WRZ

March 2019



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# 1. South Meirionydd – WRZ Reference no. 8036

## 1.1. South Meirionydd Water Resources Overview

The South Meirionydd Water Resource Zone stretches from the coastal town of Tywyn and the Dysynni estuary, north-westwards to Dolgellau and the western fringes of Lake Vyrnwy, see **Error! Reference source not found.**



Figure 1 - Map of the South Meirionydd WRZ

The water resources within the zone consist of one impounding reservoir (Llyn Cynwch), three river abstractions (Afon Gwriil, Afon Calettwr and Afon Wnion) and three spring sources (Abergynolwyn, Dinas Mawddwy and Llanymawddwy). A list of our raw water sources for the zone is presented in Table 1.

Site Name	Licence No.	Source Type	Status
Llyn Cynwch	23/64/04/0065	Impounding Reservoir	Operational
Afon Gwriil	23/64/14/0003	River Intake	Operational
Afon Calettwr	23/64/14/0002	River Intake	Standby
Afon Wnion	23/64/4/0068	River Intake	Standby
Abergynolwyn	23/64/13/0030	Spring Source	Operational
Brynlllys Spring, Dinas Mawddwy	23/64/6/0022	Spring Source	Operational

Llanymawddwy	26/64/6/018	Spring Source	Operational
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Table 1 - Licensed sources in the South Meirionnydd WRZ

There is only one reservoir in the zone, Llyn Cynwch, which feeds Penycefn water treatment works. The catchment area is relatively small compared with the storage volume and so it is slow to refill. For example, in the aftermath of the 1995 dry summer Llyn Cynwch did not spill until April 1999. To overcome this risk we have installed a pump refill scheme from the Afon Wnion.

We have two river abstractions; Afon Gwriol and Afon Calettwr which feed Garreglwyd water treatment works, and three small spring sources with their own associated works supplying the local communities of Abergynolwyn, Llanymawddwy and Brynlllys (Dinas Mawddwy).

Water transfers include an export to Hafren Dyfrdwy to supply a small number of domestic properties where it is operationally challenging for them to meet the demand. There is a corresponding and slightly larger import of water from Hafren Dyfrdwy where it is operationally difficult for us to supply customers.

## 1.2.Drought Triggers

The drought status of the zone is assessed by the reservoir storage position at any time in relation to the Drought Action Zones (DAZs) defined for Llyn Cynwch, as shown in Figure 2. The use of the DAZs are described in more detail in Section 2 of the main report.

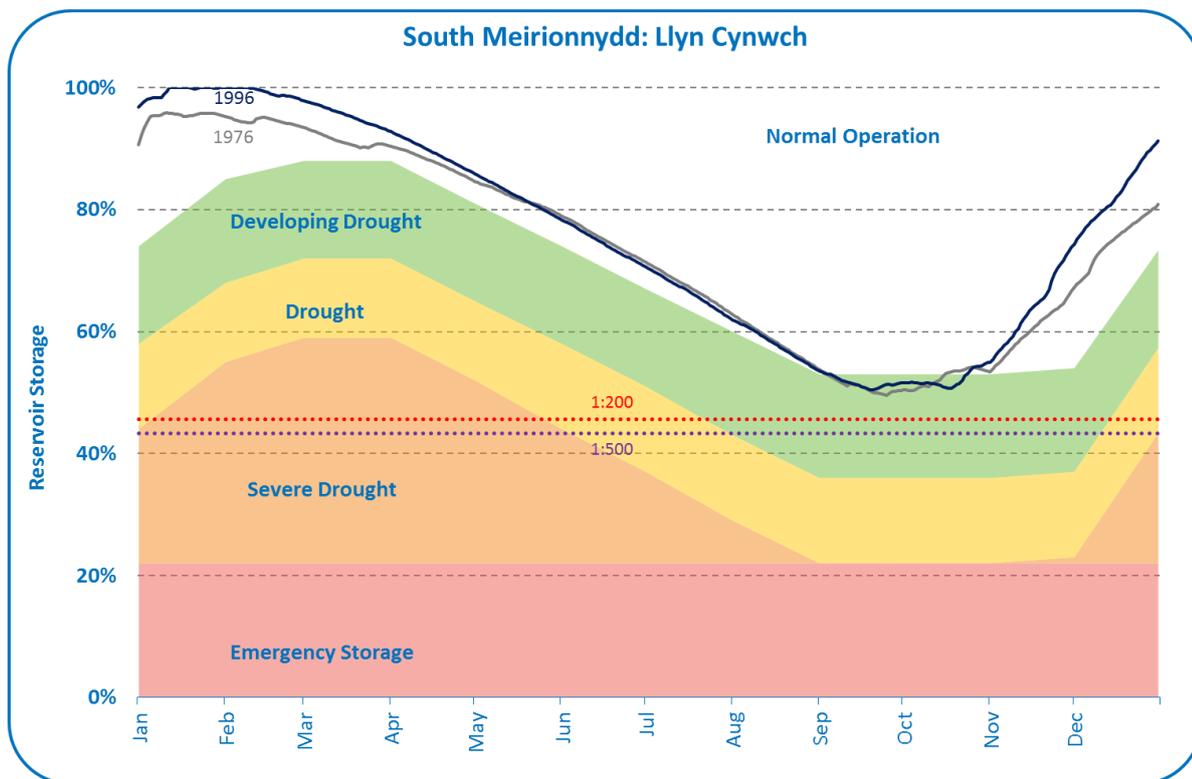


Figure 2 - Llyn Cynwch Reservoir Drought Action Zones showing the results of scenario testing

### 1.3. Assessment of Drought Risk

For our 2019 Water Resource Management Plan we tested our ability to maintain supplies of water to our customers in the South Meirionydd zone using the period 1958 – 2015, which encompasses the known drought events of 1959, 1976, 1984, 1989 and 1995. The reported supply demand balance at WRMP19 shows the zone to be in a healthy position with a forecast 0.5 MI/d surplus at 2024/25, increasing to 0.88 MI/d by 2049/50. The WRZ was therefore classified as being at low risk of significant drought impact.

Figure 2 shows the results of our scenario testing. The worst historic droughts, when simulated in our water resource models, do not cause reservoir storage to fall lower than our Developing Drought action zone. However, as the historic drought events were less severe than those of a return period of 1:200, for WRMP19 we used Extreme Value Analysis to provide an estimation of the level of drawdown we could see at Llyn Cynwch under a 1:200 and 1:500 year drought return period scenario, as represented on the chart by the red and purple lines respectively.

Our analysis indicates that, under both a 1:200 and 1:500 year drought event, Llyn Cynwch would likely not fall further than the Developing Drought Action zone (assuming minimum drawdown would be in the late summer). This is shown by the red and purple lines in Figure 2 respectively.

Overall, our scenario testing tells us that the risk of needing to implement extreme supply side measures e.g. widespread pressure management or water rationing is negligible but that during these severe drought events, we need to ensure careful management of our water resources as the reservoir storage may fall to very low levels.

### 1.4. Drought Management of the WRZ

As the identified drought risk in the zone is low then our management philosophy is to ensure we operate our water resources in line with our control curves and take all necessary actions in good time, in order to maintain this high level of drought resilience.

The following sections describe the operation of the zone as we move into a drought period and the actions that we will take to ensure that we minimise the impact on customers.

#### 1.4.1. Normal Action Zone

During normal weather conditions we abstract from each source to feed its local water treatment works. At Gwastadgoed we normally abstract from the Afon Gwrl unless the river levels are low, in which case we will commence abstraction from the Afon Calettwr as well.

Llyn Cynwch only has a very small catchment area above it and so is slow to refill in the winter. If reservoir levels are still low we are able to use the Wnion pump refill scheme between mid-October and mid-March to increase the levels. The operational control rule specifies when this should be used.

The Brynllys spring can run dry, so as part of our routine dry weather operation we will tanker treated water from Penycefn works to maintain supplies. We will also tanker water to Abergynolwyn and Llanymawddwy when required as these sources begin to deplete.

#### 1.4.2. Developing Drought/ Drought/ Severe Drought Action Zone

Although Llyn Cynwch is slow to refill, the storage in the reservoir is large compared with the abstraction demand (even if we are required to tanker to the spring sources during dry weather). By using the Afon Wnion pump refill scheme we can ensure that stocks in Llyn Cynwch are high enough to support the whole summer demand. As a result it is extremely unlikely that the WRZ will be constrained by a lack of resource availability during a drought.

#### 1.5. Supply-side drought management action

Given the high drought resilience of the zone, it is not considered necessary to develop further supply-side options. Therefore for the South Meirionnydd zone we have not produced any Environmental Assessment Reports (EARs) nor populated Appendix G of NRW's Water Company Drought Plan Technical Guideline (Dec 2017).