

TECHNICAL NOTE

JBA Project Code
Contract
Client
Day, Date and Time
Author
Reviewer / Sign-off
Subject

2021s0335
Cymric House FCA
Victor Johnson
11/05/2021
L Archer-Lock
J Essex
Review of 2017 hydrology

JBA
consulting

1 Review of hydrology for Cymric House FCA

A review of the 2017 hydrology, used in the 2017 NRW modelling of Port Talbot which was provided to JBA Consulting by NRW for the Cymric House FCA, has been undertaken to consider whether the peak flows used in the modelling remain fit for purpose. Modest changes in flood flow estimates are common as standard methods and technical guidance changes. However, flow estimates are commonly revisited if calculations are older than 5 years, key datasets/guidance has changed or expected increases are greater than 10%.

The 2017 hydrology used the FEH Statistical method to estimate flows. Since the hydrology was completed in 2017, the BFIHOST19 descriptor has become available. The value for the study catchment (0.388), is lower than the BFIHOST value (0.456), which therefore increases the FEH Statistical estimate of QMED.

Station 58012 (Afan @ Macroft Weir) was used as a donor to adjust QMED in the 2017 study, and is still the most suitable donor sitting only 2km upstream of the site of interest. The donor adjustment factor has been checked, taking into account the latest QMED value from the NFRA dataset, and also the BFIHOST19 value for this station (0.383). Once the BFIHOST19 descriptor is used for the donor as well, this brings the QMED_{CD} value pretty much in line with the QMED_{AM} value. The lower BFIHOST19 value reduces the adjustment factor from 1.18 to 1.00.

Therefore, although BFIHOST19 increases the QMED_{CD} estimate by ~20%, this is balanced out by the donor adjustment now essentially being zero instead of ~17%, and only gives an overall 2% increase in QMED between 2017 and 2021.

A new pooling group has also been generated using the latest NFRA peak flows dataset (V9). This has been done using WINFAP V4, using an urban threshold of 0.03 (rural pooling group) and 0.3 (urban pooling group) as in the NRW guidance. The biggest difference to flows since 2017 is the pooling group and growth factors. The 100yr growth factor is now 2.08 (if using the urban pooling group) compared to 1.94 in 2017. As the URBEXT value for the study site is 0.03, then the rural pooling group, which generates slightly lower flows, may be preferable, but there is little difference to flows between the urban and rural pooling groups.

The ReFH2 0.1%/1% AEP ratio remains virtually the same as in 2017.

Table 1-1: Comparison of peak flows

	2% AEP	1% AEP	0.1% AEP (with ReFH2 ratio)
FEH Statistical 2017 flows (m ³ /s)	98	189	313
FEH Statistical 2021 rural pooling group) (m ³ /s)	100 (+1.9%)	204 (+7.7%)	334 (+6.8%)
FEH Statistical 2021 (urban pooling group) (m ³ /s)	100 (+1.9%)	208 (+9.6%)	340 (+8.6%)

As Table 1-1 shows, there may be a small increase in peak flows compared to the 2017 hydrology, but there is less than a 10% change in the peak flow estimates for the 1%

TECHNICAL NOTE

JBA Project Code
Contract
Client
Day, Date and Time
Author
Reviewer / Sign-off
Subject

2021s0335
Cymric House FCA
Victor Johnson
11/05/2021
L Archer-Lock
J Essex
Review of 2017 hydrology

JBA
consulting

and 0.1% AEP events using the urban pooling group, and less than 8% using the rural pooling group. It is also important to consider the uncertainty associated with peak flow estimates for less frequent events in the context of the difference we are seeing between the 2017 and 2021 estimates. Therefore, it is concluded that it is not necessary to update the hydrology and re-run the model for the purposes of the FCA.

Furthermore, the Flood Consequence Assessment prepared for Cymric House shows the relative insensitivity of the model results to changes in flow. This is shown by the modest 0.11m change in water level at the site between the 1% AEP plus climate change event and the 0.1% AEP event - an increase in flow of 27%.