

Ffos-y-Fran, Merthyr Tydfil

Catchment and Flow Analysis

March 2026

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Introduction

Waterco has been instructed to prepare a Catchment Assessment and Flow Analysis in respect of the former opencast mine at Ffos-y-Fran, Merthyr Tydfil, CF48 4AH (the site). This study includes analysis of the whole site, excluding the western extent of the site which drains to the Nant Morlais catchment. A separate assessment of the areas draining to the Nant Morlais catchment has been undertaken (see Waterco report 15840- Hydrology Assessment - Morlais – 01).

The purpose of this report is to:

- Derive the on-site sub-catchment areas.
- Derive the peak flow from the site sub-catchment areas.
- Derive the capacity of the culverts draining the site to downstream watercourses, determining whether they have sufficient capacity to accommodate flow from the site in storm conditions.
- Derive the capacity of the receiving watercourses, determining whether they have sufficient capacity to accommodate flow from the site in storm conditions.
- Determine whether any on-site attenuation storage is required.

Existing Conditions

The Ffos-y-Fran site covers an area of approximately 400 hectares (ha) and is centred at National Grid Reference (NGR): 307512, 206905. A location plan is included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed March 2026) shows that the site currently comprises an opencast coal mine, with operations having ceased in November 2023. Part of the site has been restored, including the western extent of the site which drains into the Nant Morlais Catchment. The southern extent of the site comprises overburden mound 3 (OB3) which is currently used as a motocross track (known as Monster Mountain). The eastern extent of the site comprises overburden mounds 1 and 2 (OB1 and OB2). The quarry void, containing a permanent waterbody is located centrally within the site.

Local Topography

Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution NRW composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). The LiDAR data shows that the overburden mounds form localised high points. The quarry void forms a low point with a base level of approximately 250.8m AOD. A LiDAR Extract is provided as Appendix B.

Existing Drainage Arrangement

The site contains a number of drainage features including contour grips installed on slopes to intercept

rainfall runoff, watercourses and a number of culverts directing flows beneath access tracks and roads. There are also a series of existing settlement lagoons and ponds which will be retained following restoration. The location of the contour grips, culverts and watercourses, in context to the sub-catchment areas, are shown on the Watercourses Draft Plan in Appendix C.

A summary of the on-site drainage sub-catchments (excluding the Nant Morlais catchment) is provided below. The catchment areas are identified on the location plan in Appendix A. All culverts referenced in this study are also shown on the location plan in Appendix A.

Quarry Void Catchment Area

The quarry void catchment contains all areas which drain rainfall runoff into the quarry void. The water level of the quarry void is linked to the local groundwater level and rises and falls seasonally. The total quarry void catchment covers an area of approximately 111.35ha.

The quarry void catchment includes a number of contour grips and watercourses west of the void. Restoration proposals show 3no. culverts associated with separate watercourses which cross beneath the former railway corridor (now a byeway open to all traffic (BOAT)). The culverts are referred to as BOAT Culvert 1, BOAT Culvert 2 and BOAT culvert 3.

BOAT Culvert 1 (installed) has an upstream catchment area of 16.435ha. BOAT Culvert 2 (proposed) has an upstream catchment area of 12.472ha. BOAT Culvert 3 (proposed) has an upstream catchment area of 53.417ha.

OB1 Northern Catchment

Rainfall runoff from the northern extent of Overburden Mound 1 (OB1) is collected by contour grips and drains to an existing watercourse north of OB1. The watercourse flows north-west and spreads, discharging informally to a watercourse south of the A4060 via a 600mm pipe (culvert A). The watercourse south of the A4060 is culverted beneath the A4060 in a 1500mm pipe, known as the Cae Harris culvert. The OB1 Northern Catchment covers an area of approximately 10.05ha.

A new section of watercourse (Blockstone watercourse) is proposed to formalise connectivity between the watercourse north of OB1 and the 600mm culvert which discharges off-site.

Bargoed Taff North-East Catchment

The Bargoed Taff North-East Catchment includes part of OB1 and OB2 and is served by a number of contour grips. Rainfall runoff is directed south towards 4no. sediment lagoons. A new watercourse (Blockstone watercourse) is proposed to formalise the flow of runoff from the southern extent of OB1.

Rainfall runoff from the Bargoed Taff North-East Catchment drains via a 600mm culvert (culvert F) (downstream of the sediment ponds) to a central ecological area. From the central ecological area, flows are directed south via a 900mm culvert (culvert I) and into Bargoed Taff watercourse which flows around the western edge of OB3.

The Bargoed Taff North-East Catchment covers an area of 40.8ha.

OB2 Nant Gyrawd Catchment

Rainfall runoff from the eastern extent of Overburden Mound 2 (OB2) drains to an existing watercourse on the eastern extent of OB2. The watercourse flows south, is culverted beneath an internal access road and Bogey Road (in a 550mm pipe) (culvert G) and enters the Nant Gyrawd downstream. The OB2 Nant Gyrawd Catchment covers an area of 11.71ha.

Nant Cwmbblacs Catchment

The Nant Cwmbblacs catchment area is served by an existing watercourse which flows west, enters 2no. lagoons and discharges off site via a 1200mm pipe (culvert K) to Nant Cwmbblacs. The easternmost lagoon contains a separate outlet to Nant Cwmbblacs in the form of twin 450mm pipes (culvert M). The Nant Cwmbblacs Catchment covers an area of 23.84ha.

OB3 Bargoed Taff Catchment

The Overburden Mound 3 (OB3) Bargoed Taff catchment includes the majority of OB3 and drains to Bargoed Taff which flows south along the western edge of OB3. The OB3 Bargoed Taff catchment receives inflow from the Bargoed Taff North-East Catchment and the central ecological area. Flows from the Bargoed Taff North-East Catchment and the central ecological area enter the OB3 Bargoed Taff catchment via a 900mm culvert (culvert I).

The OB3 Bargoed Taff catchment covers an area of 132.81ha (inclusive of the 40.8ha Bargoed Taff North-East Catchment and the 17.5ha central ecological area).

Bargoed Taff flows south from the site and immediately crosses beneath an access road at NGR 308023, 205351 via twin 600mm culverts (culvert Q).

OB3 Bargoed Taff Tributary 1 Catchment

The OB3 Bargoed Taff Tributary 1 Catchment includes a small catchment area south-east of OB3. The catchment receives runoff from the south-eastern slope of OB3 and drains off site via 4no settlement lagoons to a tributary of Bargoed Taff. The catchment area covers 10.5ha.

OB3 Bargoed Taff Tributary 2 Catchment

The OB3 Bargoed Taff Tributary 2 Catchment includes the south-eastern extent of the plateau of OB3 and drains south via a watercourse into Bargoed Taff to the south of the site. The catchment area covers 23.22ha.

OB3 Nant Gyrawd Catchment

The OB3 Nant Gyrawd Catchment serves the eastern slope of OB3 and drains to Nant Gyrawd east of the site. A large extent of the catchment drains via a pond and 2no settlement lagoons. The catchment area covers 15.87ha.

Catchment Analysis

The following catchment analysis details the peak rainfall runoff rates from the individual sub-catchment areas; the capacity of the receiving culverts (where applicable) and the capacity of the receiving watercourses.

Methodology

Peak Rainfall Runoff Analysis

The peak runoff rate from each catchment has been derived using ReFH2 software. Rainfall data has been obtained from the Flood Estimation Handbook (FEH) web service (point data). ReFH2 outputs are included in Appendix D.

Culvert Capacity Assessment

The full bore discharge capacity of the culverts has been estimated using the Colebrook White equation. The majority of culverts are concrete pipes and as such a roughness coefficient value (K_s – mm) of 0.15 has been applied. The roughness coefficient represents concrete pipes in ‘normal condition’ and is derived from the HR Wallingford ‘Tables for the hydraulic design of pipes and sewers – 4th Edition’. The individual pipe sizes, lengths and gradients are detailed in the following report sections. A roughness coefficient of 0.06 has been applied to HDPE pipes (the BOAT 1 culvert).

The upstream and downstream invert levels of the culverts have been obtained from topographical survey, Client measurements and LiDAR data.

The culvert capacity calculations are provided as Appendix E.

Watercourse Capacity Assessment

The flow capacity of the receiving watercourses has been estimated using the Mannings Formula. A Mannings “n” value of 0.035 has been applied for straight natural channels with weeds and stones. A Mannings “n” value of 0.016 has been applied for block stone channels.

The cross-sectional areas of the receiving watercourses have been obtained from topographical survey and LiDAR data.

The watercourse channel capacity calculations are included as Appendix F.

Results

Quarry Void Catchment Area

Peak Runoff

Based on a catchment area of 111.35ha, a peak runoff rate of 6,359.1 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 6,254.2l/s has been estimated for the 1 in 1000 year event.

Further peak flow analysis has been undertaken for the catchment areas upstream of the culverts (existing and proposed) beneath the BOAT.

BOAT Culvert 1 (installed) has an upstream catchment area of 16.435ha. A peak runoff rate of 954.8 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 939 l/s has been estimated for the 1 in 1000 year event.

BOAT Culvert 2 (proposed) has an upstream catchment area of 12.472ha. A peak runoff rate of 725.8 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 713.8 l/s has been estimated for the 1 in 1000 year event.

BOAT Culvert 3 (proposed) has an upstream catchment area of 53.417ha. A peak runoff rate of 3,075 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 3,024.3 l/s has been estimated for the 1 in 1000 year event.

Culvert Capacity

BOAT Culvert 1

BOAT Culvert 1 comprises of a twin 600mm culvert beneath the BOAT. The twin culverts have similar inlet and outlet invert level (both inlet inverts are within 35mm of each other). The culvert capacity has been based on an invert level of 363.27m AOD at the inlet and 361.89m AOD at the outlet. The culvert is 14m long and has a hydraulic gradient of 1 in 10.14.

The full-bore culvert capacity of a single 600mm culvert is 2,743 l/s. The capacity would be doubled to 5,486 l/s when both culverts are considered. The culverts are therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC (954.8 l/s) and 1 in 1000 year (939 l/s) events.

BOAT Culvert 2

BOAT culvert 2 will be installed as part of the restoration work. Based on the estimated inflow, and assuming the hydraulic gradient would be similar to that of BOAT Culvert 1, a single 600mm culvert laid at a gradient of 1 in 10 (capacity of 2,743 l/s) would be sufficient to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC (725.8 l/s) and 1 in 1000 year (713.8 l/s) events.

Boat Culvert 3

BOAT culvert 3 will be installed as part of the restoration work. Based on the estimated inflow (3,075 l/s during the 1 in 100 year plus 40% CC event), twin 600mm culverts (as per the BOAT 1 culverts) laid at a gradient of 1 in 10 (capacity of 5,486 l/s) would be sufficient to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

OB1 Northern Catchment

Peak Runoff

Based on a catchment area of 10.05ha, a peak runoff rate of 585.5 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 575.8 l/s has been estimated for the 1 in 1000 year event.

Culvert Capacity

The catchment drains off site via a 600mm culvert (culvert A). An approximate invert level of 352.8m AOD is

recorded at the inlet and an invert level of 349.5m AOD is recorded at the outlet. The culvert is 31m long and has a hydraulic gradient of 1 in 9.4.

The full-bore culvert capacity is 2,622 l/s. The culvert is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

Watercourse Channel Capacity

A new section of watercourse (Blockstone watercourse) is proposed to formalise connectivity between the watercourse north of OB1 and the 600mm culvert which discharges off-site.

The watercourse will cover a distance of approximately 286m and will fall from an upstream level of approximately 411m AOD to a downstream level of approximately 358m AOD. The average fall across the watercourse length is 1 in 5.4. Based on the steep gradient, the watercourse will be formed with a series of cascades designed to limit erosion and slow flow velocities.

Watercourse channel capacity calculations (Appendix F) have been based on a conservative longitudinal fall of 1 in 20. Based on a longitudinal fall of a 1 in 20, a 0.5m deep x 1m wide channel (with vertical stone sides) would be sufficient to accommodate the 1 in 100 year plus 40% CC and 1 in 1000 year events. Based on the aforementioned dimensions, the watercourse could accommodate a flow of up to 2,773.1 l/s (2.773m³/s).

Bargoed Taff North-East Catchment

Peak Runoff

The catchment drains via a 600mm culvert (culvert F) to a central ecological area. From the central ecological area flows are directed south via a 900mm pipe (culvert I) and into Bargoed Taff which flows around the western edge of OB3.

Based on a catchment area of 40.8ha, upstream of the 600mm culvert, a peak runoff rate of 2,354.5 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 2,315.6 l/s has been estimated for the 1 in 1000 year event.

Based on a catchment area of 58.3ha, upstream of the 900mm culvert (including for the central ecological area) a peak runoff rate of 3,353.3 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 3,297.9 l/s has been estimated for the 1 in 1000 year event.

Culvert Capacity

The 600mm culvert (culvert F) has an approximate invert level of 378.11m AOD at the inlet and an invert level of 376.28m AOD at the outlet. The culvert is 29m long and has a hydraulic gradient of 1 in 15.84.

The full-bore culvert capacity is 2,016.3 l/s. The culvert is therefore of sufficient capacity to accommodate the peak runoff rate during the 1 in 100 year and 1 in 200 year events. The capacity is exceeded during the 1 in 100 year plus 40% climate change and 1 in 1000 year events. The culvert discharges from a series of lagoons which would provide attenuation storage upstream of the culvert. An attenuation storage estimate is provided in the following report sections.

The 900mm culvert (culvert I) has an approximate invert level of 368.56m AOD at the inlet and 365.61m AOD

at the outlet. The culvert is 40m long and has a hydraulic gradient of 1 in 13.56.

The full-bore culvert capacity is 6,272 l/s. The culvert is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC (3,353.3 l/s) and 1 in 1000 year (3,297.9 l/s) events.

Watercourse Channel Capacity

A new section of watercourse (Blockstone watercourse) is proposed to formalise flow from the southern side of OB1 into Bargoed Taff.

The watercourse will cover a distance of approximately 418m and will fall from an upstream level of approximately 475m AOD to a downstream level of approximately 394m AOD. The average fall across the watercourse length is 1 in 5.16. Based on the steep gradient, the watercourse will be formed with a series of cascades designed to limit erosion and slow flow velocities.

Watercourse channel capacity calculations (Appendix F) have been based on a conservative longitudinal fall of 1 in 20. Based on a longitudinal fall of a 1 in 20, a 0.5m deep x 1m wide channel (with vertical stone sides) would be sufficient to accommodate the 1 in 100 year plus 40% CC and 1 in 1000 year events. Based on the aforementioned dimensions, the watercourse could accommodate a flow of up to 2,773.1 l/s (2.773m³/s).

OB2 Nant Gyrawd Catchment

Peak Runoff

Based on a catchment area of 11.71ha, a peak runoff rate of 681.7 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 670.4 l/s has been estimated for the 1 in 1000 year event.

Culvert Capacity

The catchment drains off site via a 550mm culvert (culvert G). An approximate invert level of 381.5m AOD is recorded at the inlet and 378.56m AOD is recorded at the outlet. The culvert is 52m long and has a hydraulic gradient of 1 in 17.68.

The full-bore culvert capacity is 1,520 l/s. The culvert is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

Nant Cwmbblacs Catchment

Peak Runoff

Based on a catchment area of 23.84ha, a peak runoff rate of 1,381.6 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 1,358.7 l/s has been estimated for the 1 in 1000 year event.

Culvert Capacity

The catchment drains off site via a 1200mm culvert (culvert K). An approximate invert level of 296.4m AOD is recorded at the inlet and 274.5m AOD is recorded at the outlet. The culvert is 124m long and has a hydraulic

gradient of 1 in 5.66.

The full-bore culvert capacity is 20,559 l/s. The culvert is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

OB3 Bargoed Taff Catchment

Peak Runoff

Based on a catchment area of 132.81ha (inclusive of the 40.8ha Bargoed Taff North-East Catchment and the 17.5ha central ecological area), a peak runoff rate of 7,567.7 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 7,442.9 l/s has been estimated for the 1 in 1000 year event.

Watercourse Capacity

The catchment drains into Bargoed Taff which flows in a relatively steep sided valley. The watercourse near to its discharge point off site (at NGR 308003, 205397) has a channel bed width of 2.3m, a depth of approximately 0.5m and a top channel width of 3.83m. The watercourse cross sectional area is 1.533m². The longitudinal fall is 1 in 8.62. A section through the watercourse is shown in Figure 1.

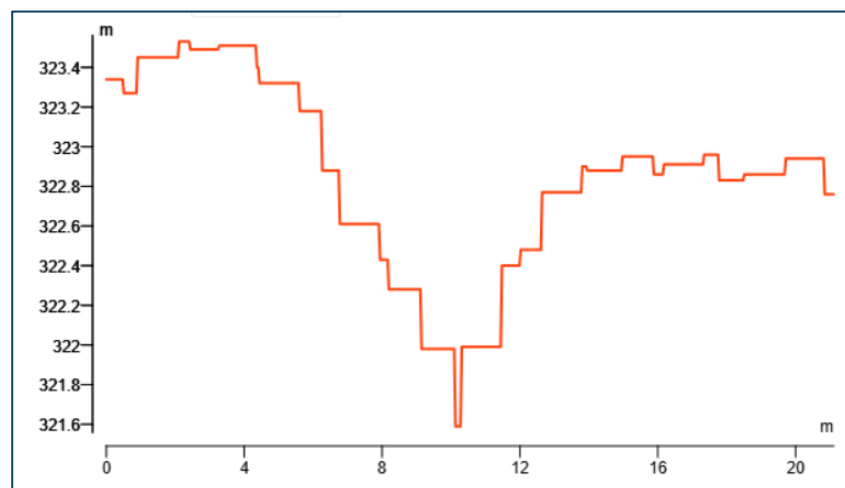


Figure 1: Bargoed Taff Channel Profile at NGR 308003, 205397

Based on the Mannings Formula, the watercourse has a flow capacity of 16,851 l/s (16.851m³/s). The watercourse is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

Culvert Capacity

Bargoed Taff flows south from the site and immediately crosses beneath an access road at NGR 308023, 205351. The culvert is a twin 600mm culvert (culvert Q). An approximate invert level of 320.12m AOD is recorded at the inlet and an invert level of 319.54m AOD is recorded at the outlet. The culvert is 11m long and has a hydraulic gradient of 1 in 18.96.

The full-bore culvert capacity of a single 600mm culvert is 1,841.6 l/s. The capacity would be doubled to 3,683.2 l/s when both culverts are considered. The culverts are of sufficient capacity to accommodate the

peak runoff rate from the receiving catchment during a 1 in 10 year event. During more extreme events, flow would overtop onto the access road and enter the channel immediately downstream. The culverts provide a throttle to flow and would store water upstream in the watercourse.

OB3 Bargoed Taff Tributary 1 Catchment

Peak Runoff

Based on a catchment area of 10.5ha, a peak runoff rate of 611.6 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 601.5 l/s has been estimated for the 1 in 1000 year event.

Watercourse Capacity

The catchment drains into a tributary of Bargoed Taff in the south-eastern extent of the catchment. The watercourse near to its discharge point off site (at NGR 308555, 204991) has a channel bed width of 3.9m, a depth of approximately 0.27m and a top channel width of 4.11m. The watercourse cross sectional area is 1.082m². The longitudinal fall is 1 in 7.59. A section through the watercourse is shown in Figure 2.

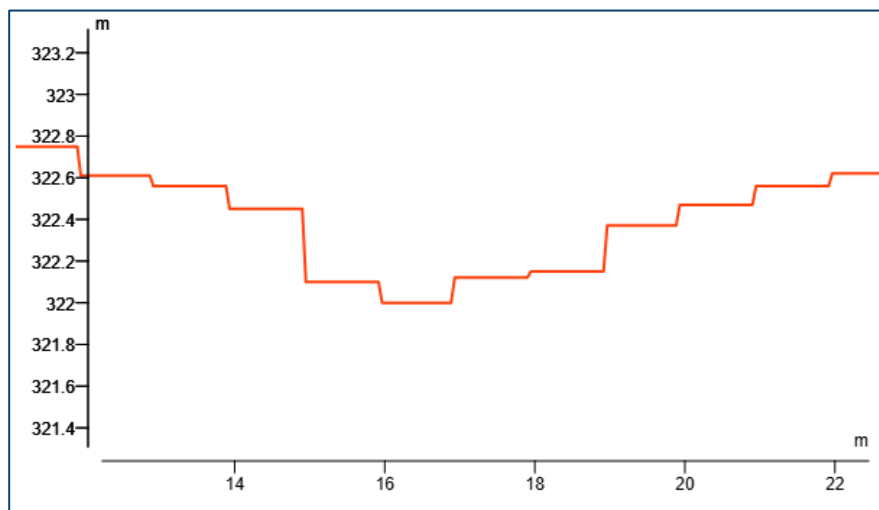


Figure 2: Bargoed Taff Tributary Channel Profile at NGR 308555, 204991

Based on the Mannings Formula, the watercourse has a flow capacity of 4,351.9 l/s. The watercourse is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

OB3 Bargoed Taff Tributary 2 Catchment

Peak Runoff

Based on a catchment area of 23.22ha, a peak runoff rate of 1,345.9 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 1,323.6 l/s has been estimated for the 1 in 1000 year event.

Watercourse Capacity

The catchment drains into a tributary of Bargoed Taff in the south-eastern extent of the catchment. The

watercourse near to its discharge point off site (at NGR 308393, 205087) has a channel bed width of 1.96m, a depth of approximately 1.37m and a top channel width of 5.97m. The watercourse cross sectional area is 5.435m². The longitudinal fall is 1 in 8.89. A section through the watercourse is shown in Figure 3.

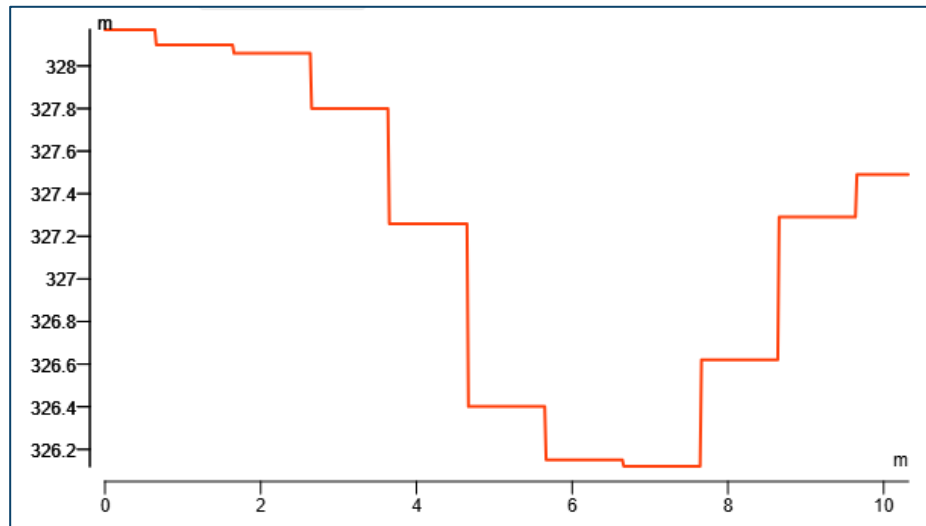


Figure 3: Bargoed Taff Tributary Channel Profile at NGR 308393, 205087

Based on the Mannings Formula, the watercourse has a flow capacity of 44,764 l/s. The watercourse is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

OB3 Nant Gyrawd Catchment

Peak Runoff

Based on a catchment area of 15.87ha, a peak runoff rate of 922.2 l/s has been estimated for the 1 in 100 year plus 40% climate change event. A peak runoff rate of 906.9 l/s has been estimated for the 1 in 1000 year event.

Watercourse Capacity

The catchment drains into a tributary of Nant Gyrawd. The watercourse immediately downstream of the site at NGR 308815, 205418 has a channel bed width of 1.25m, a depth of approximately 0.25m and a top channel width of 1.72m. The watercourse cross sectional area is 0.371m². The longitudinal fall is 1 in 10.63. A section through the watercourse is shown in Figure 4.

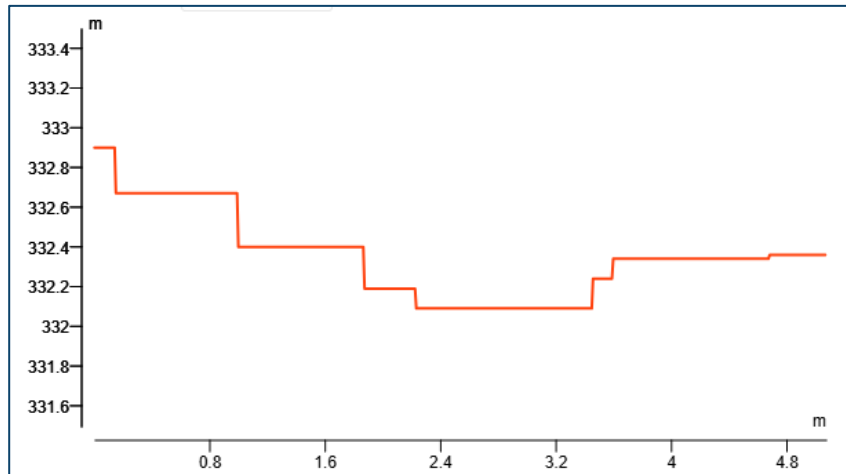


Figure 4: Nant Gyrawd Tributary at NGR 308815, 205418

Based on the Mannings Formula, the watercourse has a flow capacity of 1,081 l/s. The watercourse is therefore of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during the 1 in 100 year plus 40% CC and 1 in 1000 year events.

Attenuation Storage

The catchment assessment has identified that a 600mm culvert (culvert F serving the Bargoed Taff North East Catchment is not of sufficient capacity to accommodate unattenuated flows during the 1 in 100 year plus 40% climate change event. The 600mm culvert forms an outlet from existing lagoons.

4no. existing lagoons are present upstream of the 600mm Bargoed Taff North East Catchment culvert. The lagoons are staggered in height (from a high in the east, to low in the west near the outfall to the 600mm pipe) and cover a combined surface area of approximately 12,446m². Flows from the upstream catchment enter the easternmost and highest lagoon. The lagoons are linked by pipework with flows discharging from the highest lagoon in the east to the lowest lagoon in the west.

An attenuation storage estimated has been undertaken using MicroDrainage software to determine the storage requirement during a 1 in 100 year plus 40% CC event. The limited discharge rate has been set to 2,016 l/s (equivalent to the 600mm pipe capacity). The contributing catchment area is 40.8ha. The MicroDrainage outputs are included in Appendix G.

The MicroDrainage outputs show that a storage volume of 25,804m³ is required to accommodate the 1 in 100 year plus 40% CC event. It is noted that based on the 600mm pipe outflow and design head, the MicroDrainage has estimated an outflow capacity of 1,000 l/s.

LiDAR data and topographical survey show that based on the top bank height of the lagoons, all lagoons are a minimum of 3m deep. Based on the existing lagoon areas (12,446m²) and minimum 3m lagoon depths, the lagoons would provide a storage volume of 37,338m³. It can therefore be concluded that additional attenuation storage would not be required as the existing lagoons provide sufficient storage to accommodate

the 1 in 100 year plus 40% CC event.

Conclusions

The purpose of this study is to:

- Derive the on-site sub-catchment areas.
- Derive the peak flow from the site sub-catchment areas.
- Derive the capacity of the culverts draining the site to downstream watercourses, determining whether they have sufficient capacity to accommodate flow from the site in storm conditions.
- Derive the capacity of the receiving watercourses, determining whether they have sufficient capacity to accommodate flow from the site in storm conditions.
- Determine whether any on-site attenuation storage is required.

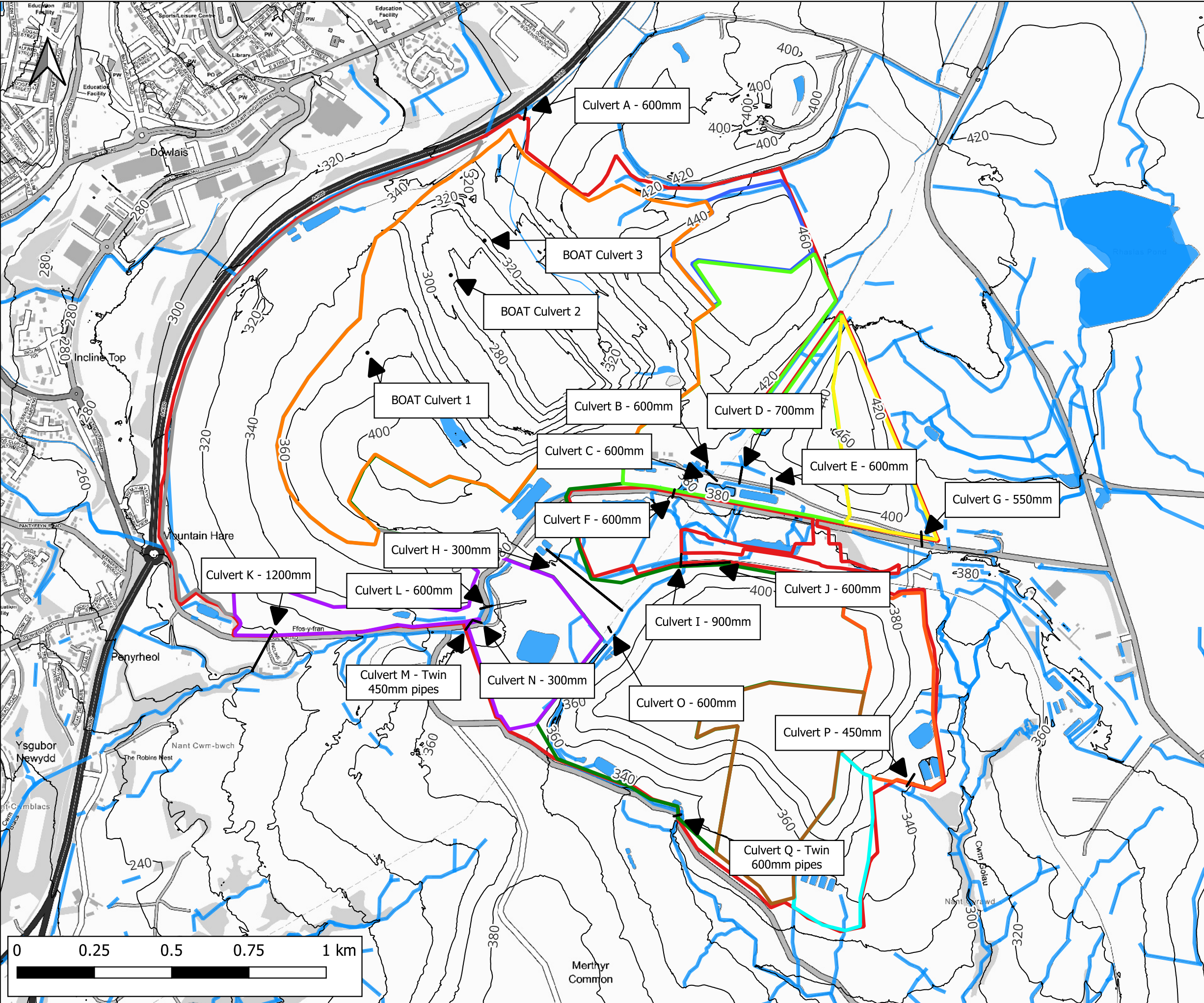
Based on the analysis of peak flows, culvert capacities and capacities of receiving watercourses, it can be concluded that the majority of culverts and watercourses which drain the on-site sub-catchment areas are of sufficient capacity to accommodate the 1 in 100 year plus 40% climate change event and the 1 in 1000 year event.

An existing 600mm culvert draining the Bargoed Taff North East Catchment (culvert F) is not of sufficient capacity to accommodate unattenuated flow during the 1 in 100 year plus 40% CC event. 4no. existing lagoons are present upstream of the 600mm Bargoed Taff North East Catchment culvert. The lagoons are staggered in height (from a high in the east, to low in the west near the outfall to the 600mm pipe) and cover a combined surface area of approximately 12,446m². Flows from the upstream catchment enter the easternmost and highest lagoon. The lagoons are linked by pipework with flows discharging from the highest lagoon in the east to the lowest lagoon in the west.

Attenuation storage calculations show that based on the outflow capacity of the 600mm culvert, a storage volume of 25,804m³ is required upstream of the culvert to accommodate the 1 in 100 year plus 40% CC event. Based on the existing lagoon areas (12,446m²) and minimum 3m lagoon depths, the lagoons would provide a storage volume of 37,338m³. It can therefore be concluded that additional attenuation storage would not be required as the existing lagoons provide sufficient storage to accommodate the 1 in 100 year plus 40% CC event.

Bargoed Taff flows south from the site and immediately crosses beneath an access road at NGR 308023, 205351. The culvert is a twin 600mm culvert (culvert Q). The culverts are of sufficient capacity to accommodate the peak runoff rate from the receiving catchment during a 1 in 10 year event. During more extreme events, flow would overtop onto the access road and enter the channel immediately downstream. The culverts provide a throttle to flow and would store water upstream in the watercourse. Upsizing of the culverts is not proposed as to not increase the flow rate through the culverts to the downstream catchment.

Appendix A Catchment Plan



Notes:
 1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies
- Culvert
- BOAT Culvert
- Quarry Void Catchment
- OB3 Nant Gyrawd Catchment
- OB3 Bargoed Taff Catchment
- OB2 Nant Gyrawd Catchment
- OB1 Northern Catchment
- Nant Morlais Catchment
- Nant Cwmblass Catchment
- Bargoed Taff North-East Catchment
- OB3 Bargoed Taff Tributary 1
- OB3 Bargoed Taff Tributary 2

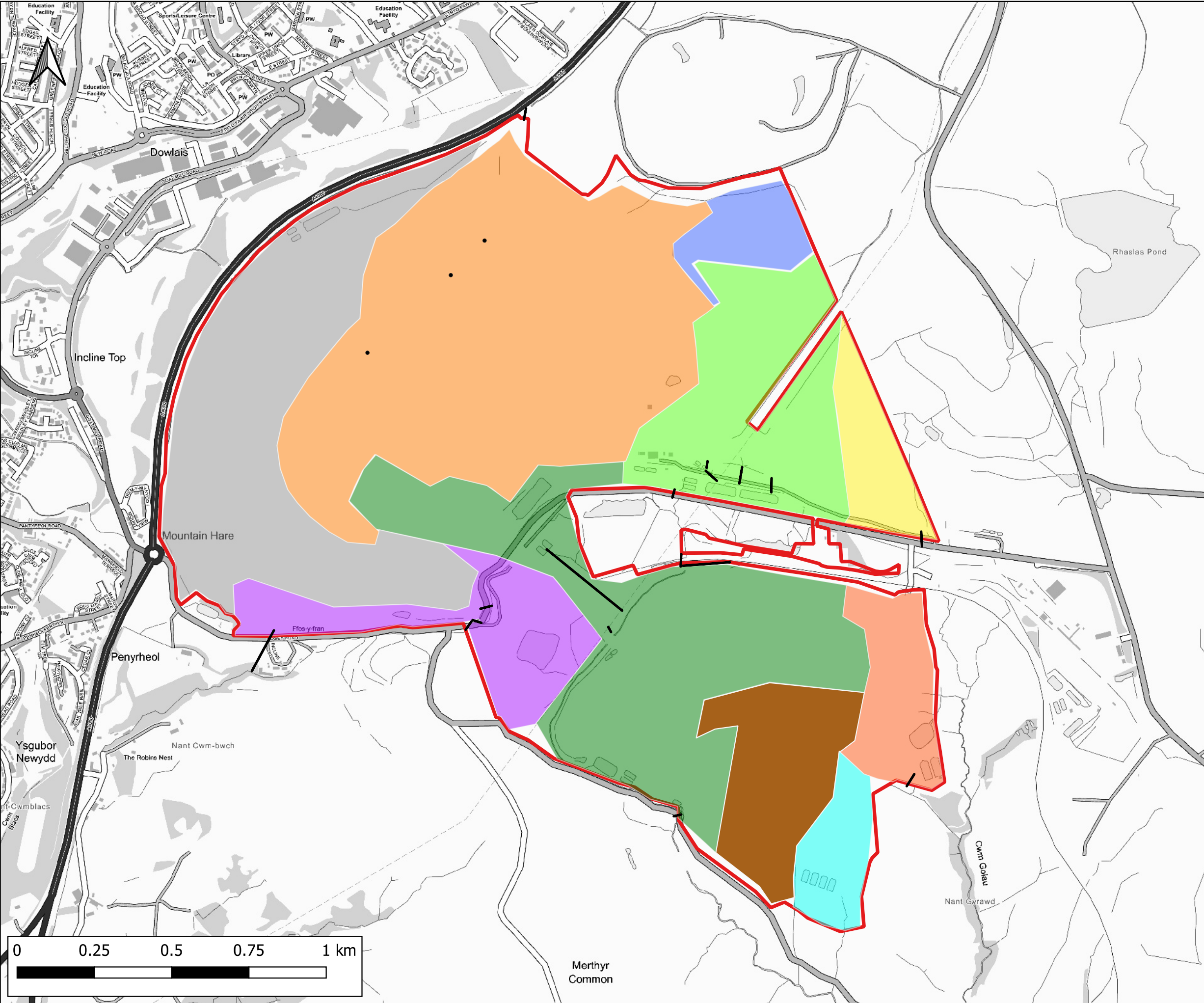
CLIENT:
 Merthyr (South Wales) Ltd

waterco
 www.waterco.co.uk

SCHEME:
 Ffos-y-Fran, Merthyr Tydfil

PLOT TITLE:
 Location Plan

PLOT STATUS: FINAL		DATE: 19-03-2026	
DRAWN: MJW	CHECKED: AW	APPROVED: MW	PLOT SCALE AT A3: 1:12000
PLOT NAME: 15840_Location_Plan			REVISION: -



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies
- Culvert
- BOAT Culvert
- Quarry Void Catchment
- OB3 Nant Gyrawd Catchment
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- Bargoed Taff North-East Catchment
- OB3 Bargoed Taff Tributary 1
- OB3 Bargoed Taff Tributary 2

CLIENT:

Merthyr (South Wales) Ltd

www.waterco.co.uk

SCHEME:

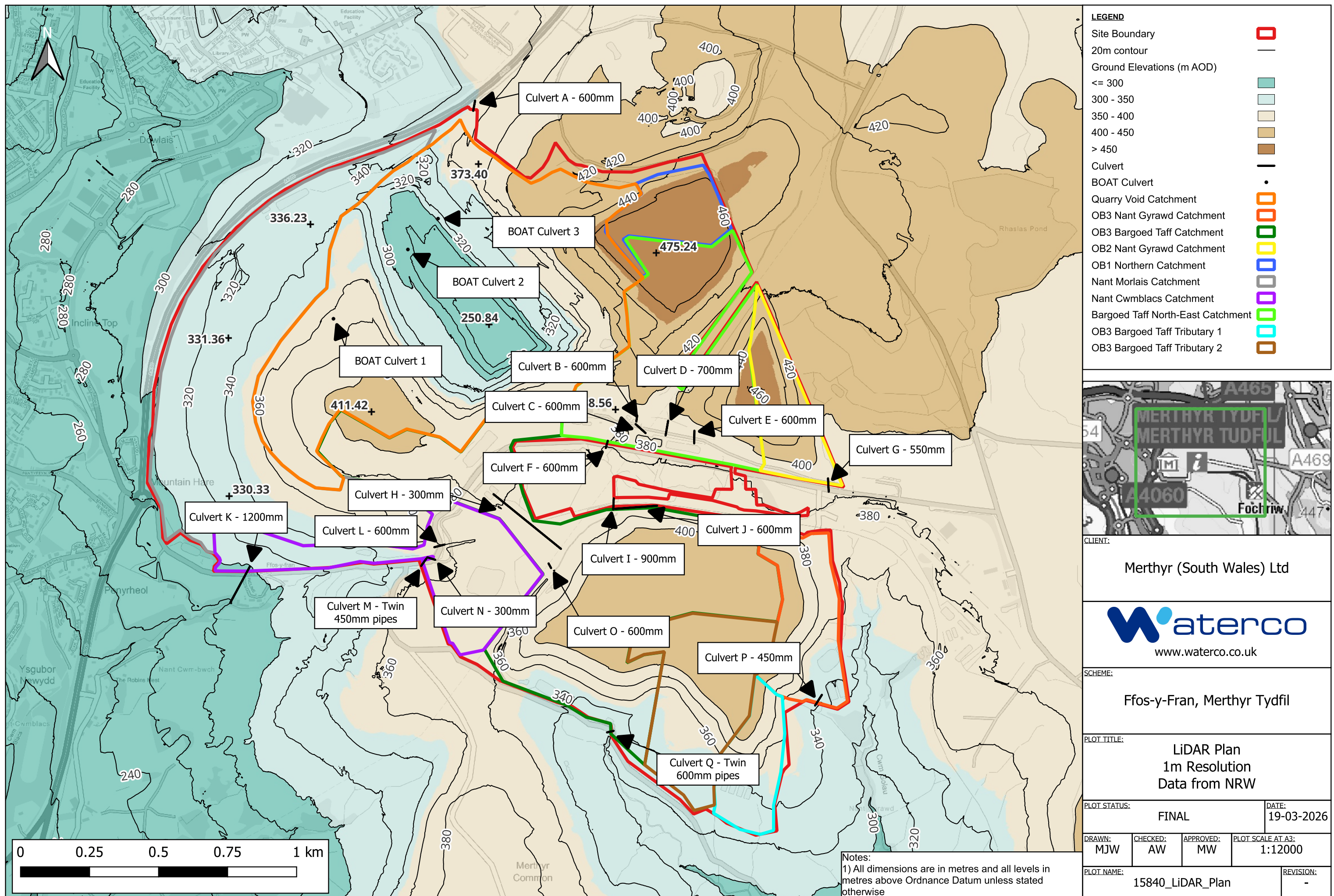
Ffos-y-Fran, Merthyr Tydfil

PLOT TITLE:

Location Plan

PLOT STATUS:		FINAL		DATE:	19-03-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:		
MJW	AW	MW	1:12000		
PLOT NAME:				REVISION:	
15840_Location_Plan				-	

Appendix B LiDAR Extract



LEGEND

1 Site Boundary

20m contour

Ground Elevations (m AOD)

≤ 300

300 - 350

350 - 400

400 - 450

> 450

Culvert

BOAT Culvert

Quarry Void Catchment

OB3 Nant Gyrawd Catchment

OB3 Bargoed Taff Catchment

OB2 Nant Gyrawd Catchment

OB1 Northern Catchment

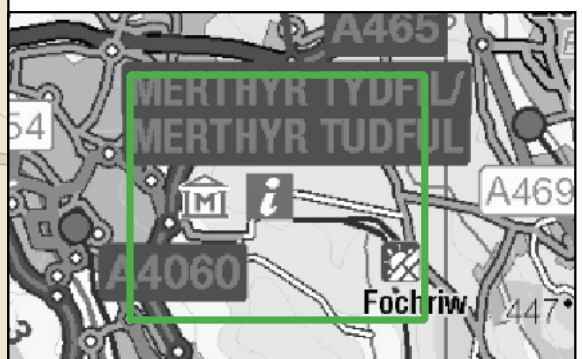
Nant Morlais Catchment

Nant Cwmbblacs Catchment

Bargoed Taff North-East Catchment

OB3 Bargoed Taff Tributary 1

OB3 Bargoed Taff Tributary 2



CLIENT:

Merthyr (South Wales) Ltd



SCHEME:

Ffos-y-Fran, Merthyr Tydfil

PLOT TITLE:

LiDAR Plan
1m Resolution
Data from NRW

PLOT STATUS:

FINAL

DATE:

DATE:
19-03-2026

DRAWN:

DRAWN:
MJW

CHECKED:

CHECKED.
AW

APPROVED:

APPROVED:
MW

	PLOT SCALE AT A3:
--	-------------------

1:12000

PLOT NAME:

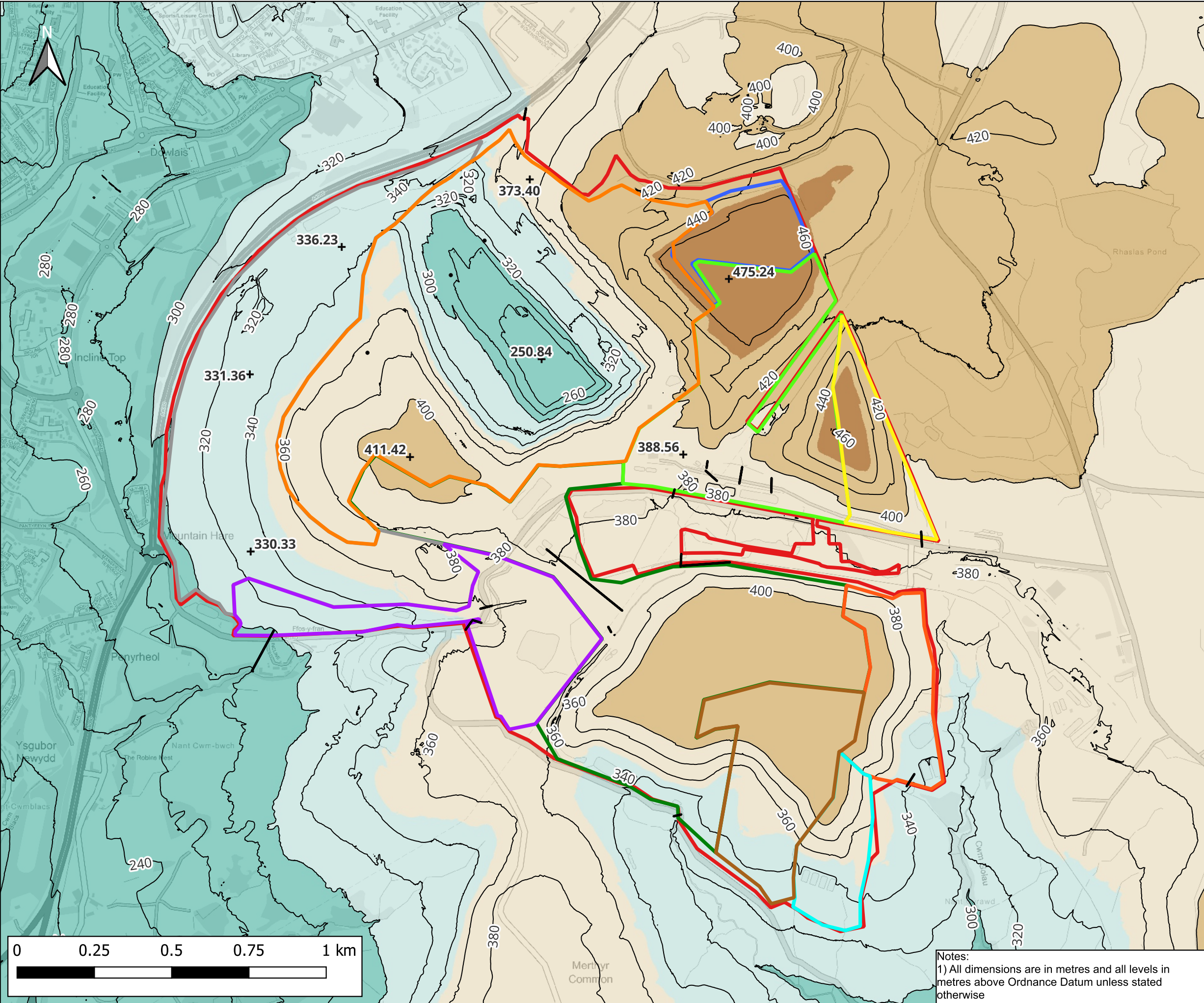
15840_LiDAR_Plan

REVISION:

REVISION:

Notes:

1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise



LEGEND

- Site Boundary
- 20m contour
- Ground Elevations (m AOD)
 - <= 300
 - 300 - 350
 - 350 - 400
 - 400 - 450
 - > 450
- Culvert
- BOAT Culvert
- Quarry Void Catchment
- OB3 Nant Gyrawd Catchment
- OB3 Bargoed Taff Catchment
- OB2 Nant Gyrawd Catchment
- OB1 Northern Catchment
- Nant Morlais Catchment
- Nant Cwmlacs Catchment
- Bargoed Taff North-East Catchment
- OB3 Bargoed Taff Tributary 1
- OB3 Bargoed Taff Tributary 2

CLIENT:

Merthyr (South Wales) Ltd

waterco

www.waterco.co.uk

SCHEME:

Ffos-y-Fran, Merthyr Tydfil

PLOT TITLE:

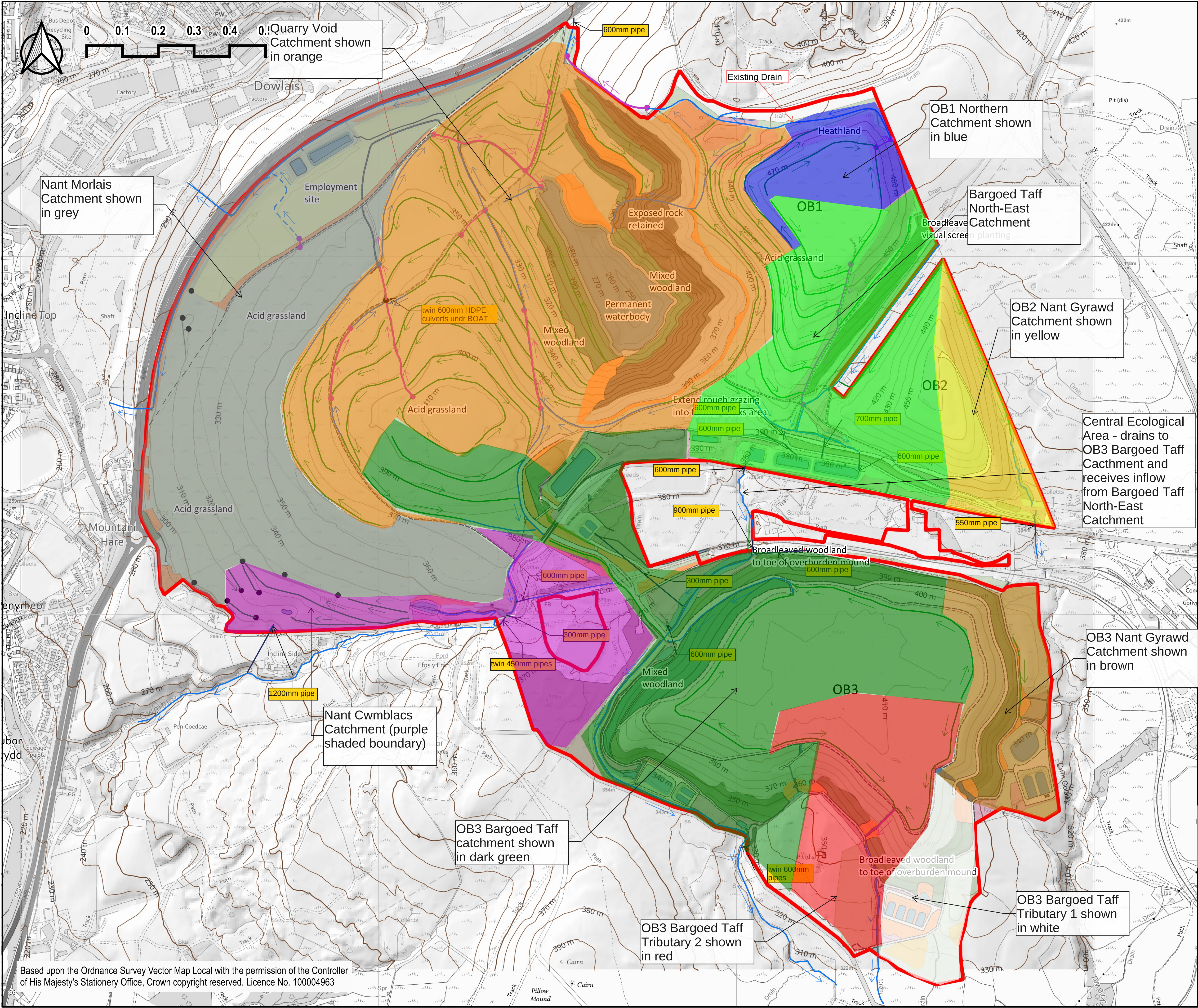
LiDAR Plan
1m Resolution
Data from NRW

PLOT STATUS:		FINAL		DATE:	19-03-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:		
MJW	AW	MW	1:12000		
PLOT NAME:				REVISION:	
15840_LiDAR_Plan				-	

Notes:

1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

Appendix C Site Watercourse / Drainage Plan



Cleient / Client:

**MERTHYR
(SOUTH WALES)
LIMITED**

Enw project / Project name:

FFOS-Y-FRAN FINAL RESTORATION

Teitl lluniad / Drawing title:

Restoration and Aftercare

Eglurhad / Key:

Application boundary

Proposed contour (10 m interval)

Improved grass

Unimproved grass

Mixed woodland

Broad-leaved woodland

Native shrub / Hedgerows

Heathland

Bog

Inland rock and scree (natural regeneration)

Standing water

Running water

Freshwater marsh

Other built structure

Metalled roadway

Pathway

Unimproved grass (allocated employment site)

Bare surface

Watercourses

Proposed Blockstone Watercourses

Direction of Flow

Contour Grips

Direction of Flow

PLAN 4 - PROPOSED
WATERCOURSES
(PHASE 2B)

Graddfa / Scale (A1):
1:5,000 @ A1

Dyddiad / Date:
MAY 2025

Durymwyd gan:
RhE

Gwilydd gan:
JS

Rhif lluniad / Drawing number:
3274-RML-DR-L-54

Cyfrifir
Revision:
01

MERTHYR (SOUTH WALES) LIMITED

Appendix D RefH2 Outputs

Quarry Void Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Quarry Void
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – Quarry Void*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	1416.526
2	1627.953
5	2302.184
10	2765.488
30	3491.438
50	3837.294
75	4120.211
100	4325.905
100 + 40% CC	6359.112
200	4839.057
1000	6254.199

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 111.35ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:07:54 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 07E3-2C6A

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 1.11 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	47.36
Total Rainfall (mm):	60.94	Total flow (ML):	67.83
Peak Rainfall (mm):	6.37	Peak flow (m ³ /s):	6.36

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.97	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.09	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.505	0.000	0.284	0.000	0.095	0.095
00:06:00	0.634	0.000	0.358	0.003	0.094	0.097
00:12:00	0.796	0.000	0.452	0.012	0.094	0.106
00:18:00	0.998	0.000	0.571	0.030	0.093	0.123
00:24:00	1.251	0.000	0.721	0.057	0.093	0.150
00:30:00	1.565	0.000	0.913	0.098	0.093	0.191
00:36:00	1.956	0.000	1.156	0.155	0.092	0.248
00:42:00	2.440	0.000	1.467	0.233	0.092	0.325
00:48:00	3.038	0.000	1.863	0.337	0.093	0.430
00:54:00	3.769	0.000	2.369	0.475	0.093	0.568
01:00:00	4.653	0.000	3.013	0.655	0.094	0.749
01:06:00	5.678	0.000	3.809	0.885	0.095	0.980
01:12:00	6.374	0.000	4.449	1.174	0.097	1.271
01:18:00	5.678	0.000	4.117	1.532	0.100	1.632
01:24:00	4.653	0.000	3.482	1.960	0.103	2.063
01:30:00	3.769	0.000	2.892	2.444	0.108	2.552
01:36:00	3.038	0.000	2.377	2.966	0.113	3.080
01:42:00	2.440	0.000	1.940	3.508	0.120	3.629
01:48:00	1.956	0.000	1.574	4.052	0.129	4.180
01:54:00	1.565	0.000	1.272	4.578	0.138	4.716
02:00:00	1.251	0.000	1.024	5.065	0.149	5.213
02:06:00	0.998	0.000	0.823	5.490	0.160	5.650
02:12:00	0.796	0.000	0.659	5.827	0.172	6.000
02:18:00	0.634	0.000	0.527	6.050	0.185	6.236
02:24:00	0.505	0.000	0.421	6.152	0.199	6.351
02:30:00	0.000	0.000	0.000	6.147	0.212	6.359
02:36:00	0.000	0.000	0.000	6.050	0.225	6.275
02:42:00	0.000	0.000	0.000	5.875	0.238	6.113
02:48:00	0.000	0.000	0.000	5.640	0.250	5.890
02:54:00	0.000	0.000	0.000	5.361	0.261	5.622
03:00:00	0.000	0.000	0.000	5.049	0.272	5.321
03:06:00	0.000	0.000	0.000	4.719	0.282	5.001
03:12:00	0.000	0.000	0.000	4.381	0.291	4.673
03:18:00	0.000	0.000	0.000	4.047	0.300	4.347

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	3.722	0.307	4.029
03:30:00	0.000	0.000	0.000	3.407	0.314	3.721
03:36:00	0.000	0.000	0.000	3.106	0.320	3.425
03:42:00	0.000	0.000	0.000	2.823	0.325	3.148
03:48:00	0.000	0.000	0.000	2.555	0.329	2.885
03:54:00	0.000	0.000	0.000	2.302	0.333	2.635
04:00:00	0.000	0.000	0.000	2.060	0.337	2.397
04:06:00	0.000	0.000	0.000	1.829	0.339	2.169
04:12:00	0.000	0.000	0.000	1.609	0.341	1.950
04:18:00	0.000	0.000	0.000	1.399	0.343	1.742
04:24:00	0.000	0.000	0.000	1.199	0.344	1.544
04:30:00	0.000	0.000	0.000	1.012	0.345	1.357
04:36:00	0.000	0.000	0.000	0.837	0.345	1.183
04:42:00	0.000	0.000	0.000	0.676	0.345	1.022
04:48:00	0.000	0.000	0.000	0.534	0.345	0.879
04:54:00	0.000	0.000	0.000	0.413	0.344	0.757
05:00:00	0.000	0.000	0.000	0.314	0.343	0.657
05:06:00	0.000	0.000	0.000	0.235	0.342	0.577
05:12:00	0.000	0.000	0.000	0.173	0.340	0.513
05:18:00	0.000	0.000	0.000	0.124	0.339	0.463
05:24:00	0.000	0.000	0.000	0.086	0.337	0.424
05:30:00	0.000	0.000	0.000	0.058	0.336	0.393
05:36:00	0.000	0.000	0.000	0.037	0.334	0.371
05:42:00	0.000	0.000	0.000	0.021	0.332	0.354
05:48:00	0.000	0.000	0.000	0.011	0.331	0.342
05:54:00	0.000	0.000	0.000	0.004	0.329	0.333
06:00:00	0.000	0.000	0.000	0.001	0.327	0.328
06:06:00	0.000	0.000	0.000	0.000	0.325	0.325
06:12:00	0.000	0.000	0.000	0.000	0.323	0.323
06:18:00	0.000	0.000	0.000	0.000	0.322	0.322
06:24:00	0.000	0.000	0.000	0.000	0.320	0.320
06:30:00	0.000	0.000	0.000	0.000	0.318	0.318
06:36:00	0.000	0.000	0.000	0.000	0.317	0.317
06:42:00	0.000	0.000	0.000	0.000	0.315	0.315
06:48:00	0.000	0.000	0.000	0.000	0.313	0.313

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.311	0.311
07:00:00	0.000	0.000	0.000	0.000	0.310	0.310
07:06:00	0.000	0.000	0.000	0.000	0.308	0.308
07:12:00	0.000	0.000	0.000	0.000	0.306	0.306
07:18:00	0.000	0.000	0.000	0.000	0.305	0.305
07:24:00	0.000	0.000	0.000	0.000	0.303	0.303
07:30:00	0.000	0.000	0.000	0.000	0.301	0.301
07:36:00	0.000	0.000	0.000	0.000	0.300	0.300
07:42:00	0.000	0.000	0.000	0.000	0.298	0.298
07:48:00	0.000	0.000	0.000	0.000	0.297	0.297
07:54:00	0.000	0.000	0.000	0.000	0.295	0.295
08:00:00	0.000	0.000	0.000	0.000	0.293	0.293
08:06:00	0.000	0.000	0.000	0.000	0.292	0.292
08:12:00	0.000	0.000	0.000	0.000	0.290	0.290
08:18:00	0.000	0.000	0.000	0.000	0.289	0.289
08:24:00	0.000	0.000	0.000	0.000	0.287	0.287
08:30:00	0.000	0.000	0.000	0.000	0.286	0.286
08:36:00	0.000	0.000	0.000	0.000	0.284	0.284
08:42:00	0.000	0.000	0.000	0.000	0.283	0.283
08:48:00	0.000	0.000	0.000	0.000	0.281	0.281
08:54:00	0.000	0.000	0.000	0.000	0.279	0.279
09:00:00	0.000	0.000	0.000	0.000	0.278	0.278
09:06:00	0.000	0.000	0.000	0.000	0.276	0.276
09:12:00	0.000	0.000	0.000	0.000	0.275	0.275
09:18:00	0.000	0.000	0.000	0.000	0.273	0.273
09:24:00	0.000	0.000	0.000	0.000	0.272	0.272
09:30:00	0.000	0.000	0.000	0.000	0.271	0.271
09:36:00	0.000	0.000	0.000	0.000	0.269	0.269
09:42:00	0.000	0.000	0.000	0.000	0.268	0.268
09:48:00	0.000	0.000	0.000	0.000	0.266	0.266
09:54:00	0.000	0.000	0.000	0.000	0.265	0.265
10:00:00	0.000	0.000	0.000	0.000	0.263	0.263
10:06:00	0.000	0.000	0.000	0.000	0.262	0.262
10:12:00	0.000	0.000	0.000	0.000	0.260	0.260
10:18:00	0.000	0.000	0.000	0.000	0.259	0.259

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.258	0.258
10:30:00	0.000	0.000	0.000	0.000	0.256	0.256
10:36:00	0.000	0.000	0.000	0.000	0.255	0.255
10:42:00	0.000	0.000	0.000	0.000	0.253	0.253
10:48:00	0.000	0.000	0.000	0.000	0.252	0.252
10:54:00	0.000	0.000	0.000	0.000	0.251	0.251
11:00:00	0.000	0.000	0.000	0.000	0.249	0.249
11:06:00	0.000	0.000	0.000	0.000	0.248	0.248
11:12:00	0.000	0.000	0.000	0.000	0.247	0.247
11:18:00	0.000	0.000	0.000	0.000	0.245	0.245
11:24:00	0.000	0.000	0.000	0.000	0.244	0.244
11:30:00	0.000	0.000	0.000	0.000	0.243	0.243
11:36:00	0.000	0.000	0.000	0.000	0.241	0.241
11:42:00	0.000	0.000	0.000	0.000	0.240	0.240
11:48:00	0.000	0.000	0.000	0.000	0.239	0.239
11:54:00	0.000	0.000	0.000	0.000	0.238	0.238
12:00:00	0.000	0.000	0.000	0.000	0.236	0.236
12:06:00	0.000	0.000	0.000	0.000	0.235	0.235
12:12:00	0.000	0.000	0.000	0.000	0.234	0.234
12:18:00	0.000	0.000	0.000	0.000	0.232	0.232
12:24:00	0.000	0.000	0.000	0.000	0.231	0.231
12:30:00	0.000	0.000	0.000	0.000	0.230	0.230
12:36:00	0.000	0.000	0.000	0.000	0.229	0.229
12:42:00	0.000	0.000	0.000	0.000	0.227	0.227
12:48:00	0.000	0.000	0.000	0.000	0.226	0.226
12:54:00	0.000	0.000	0.000	0.000	0.225	0.225
13:00:00	0.000	0.000	0.000	0.000	0.224	0.224
13:06:00	0.000	0.000	0.000	0.000	0.223	0.223
13:12:00	0.000	0.000	0.000	0.000	0.221	0.221
13:18:00	0.000	0.000	0.000	0.000	0.220	0.220
13:24:00	0.000	0.000	0.000	0.000	0.219	0.219
13:30:00	0.000	0.000	0.000	0.000	0.218	0.218
13:36:00	0.000	0.000	0.000	0.000	0.217	0.217
13:42:00	0.000	0.000	0.000	0.000	0.215	0.215
13:48:00	0.000	0.000	0.000	0.000	0.214	0.214

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.213	0.213
14:00:00	0.000	0.000	0.000	0.000	0.212	0.212
14:06:00	0.000	0.000	0.000	0.000	0.211	0.211
14:12:00	0.000	0.000	0.000	0.000	0.210	0.210
14:18:00	0.000	0.000	0.000	0.000	0.209	0.209
14:24:00	0.000	0.000	0.000	0.000	0.207	0.207
14:30:00	0.000	0.000	0.000	0.000	0.206	0.206
14:36:00	0.000	0.000	0.000	0.000	0.205	0.205
14:42:00	0.000	0.000	0.000	0.000	0.204	0.204
14:48:00	0.000	0.000	0.000	0.000	0.203	0.203
14:54:00	0.000	0.000	0.000	0.000	0.202	0.202
15:00:00	0.000	0.000	0.000	0.000	0.201	0.201
15:06:00	0.000	0.000	0.000	0.000	0.200	0.200
15:12:00	0.000	0.000	0.000	0.000	0.199	0.199
15:18:00	0.000	0.000	0.000	0.000	0.198	0.198
15:24:00	0.000	0.000	0.000	0.000	0.197	0.197
15:30:00	0.000	0.000	0.000	0.000	0.195	0.195
15:36:00	0.000	0.000	0.000	0.000	0.194	0.194
15:42:00	0.000	0.000	0.000	0.000	0.193	0.193
15:48:00	0.000	0.000	0.000	0.000	0.192	0.192
15:54:00	0.000	0.000	0.000	0.000	0.191	0.191
16:00:00	0.000	0.000	0.000	0.000	0.190	0.190
16:06:00	0.000	0.000	0.000	0.000	0.189	0.189
16:12:00	0.000	0.000	0.000	0.000	0.188	0.188
16:18:00	0.000	0.000	0.000	0.000	0.187	0.187
16:24:00	0.000	0.000	0.000	0.000	0.186	0.186
16:30:00	0.000	0.000	0.000	0.000	0.185	0.185
16:36:00	0.000	0.000	0.000	0.000	0.184	0.184
16:42:00	0.000	0.000	0.000	0.000	0.183	0.183
16:48:00	0.000	0.000	0.000	0.000	0.182	0.182
16:54:00	0.000	0.000	0.000	0.000	0.181	0.181
17:00:00	0.000	0.000	0.000	0.000	0.180	0.180
17:06:00	0.000	0.000	0.000	0.000	0.179	0.179
17:12:00	0.000	0.000	0.000	0.000	0.178	0.178
17:18:00	0.000	0.000	0.000	0.000	0.177	0.177

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.176	0.176
17:30:00	0.000	0.000	0.000	0.000	0.175	0.175
17:36:00	0.000	0.000	0.000	0.000	0.174	0.174
17:42:00	0.000	0.000	0.000	0.000	0.173	0.173
17:48:00	0.000	0.000	0.000	0.000	0.173	0.173
17:54:00	0.000	0.000	0.000	0.000	0.172	0.172
18:00:00	0.000	0.000	0.000	0.000	0.171	0.171
18:06:00	0.000	0.000	0.000	0.000	0.170	0.170
18:12:00	0.000	0.000	0.000	0.000	0.169	0.169
18:18:00	0.000	0.000	0.000	0.000	0.168	0.168
18:24:00	0.000	0.000	0.000	0.000	0.167	0.167
18:30:00	0.000	0.000	0.000	0.000	0.166	0.166
18:36:00	0.000	0.000	0.000	0.000	0.165	0.165
18:42:00	0.000	0.000	0.000	0.000	0.164	0.164
18:48:00	0.000	0.000	0.000	0.000	0.163	0.163
18:54:00	0.000	0.000	0.000	0.000	0.163	0.163
19:00:00	0.000	0.000	0.000	0.000	0.162	0.162
19:06:00	0.000	0.000	0.000	0.000	0.161	0.161
19:12:00	0.000	0.000	0.000	0.000	0.160	0.160
19:18:00	0.000	0.000	0.000	0.000	0.159	0.159
19:24:00	0.000	0.000	0.000	0.000	0.158	0.158
19:30:00	0.000	0.000	0.000	0.000	0.157	0.157
19:36:00	0.000	0.000	0.000	0.000	0.157	0.157
19:42:00	0.000	0.000	0.000	0.000	0.156	0.156
19:48:00	0.000	0.000	0.000	0.000	0.155	0.155
19:54:00	0.000	0.000	0.000	0.000	0.154	0.154
20:00:00	0.000	0.000	0.000	0.000	0.153	0.153
20:06:00	0.000	0.000	0.000	0.000	0.152	0.152
20:12:00	0.000	0.000	0.000	0.000	0.152	0.152
20:18:00	0.000	0.000	0.000	0.000	0.151	0.151
20:24:00	0.000	0.000	0.000	0.000	0.150	0.150
20:30:00	0.000	0.000	0.000	0.000	0.149	0.149
20:36:00	0.000	0.000	0.000	0.000	0.148	0.148
20:42:00	0.000	0.000	0.000	0.000	0.147	0.147
20:48:00	0.000	0.000	0.000	0.000	0.147	0.147

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.146	0.146
21:00:00	0.000	0.000	0.000	0.000	0.145	0.145
21:06:00	0.000	0.000	0.000	0.000	0.144	0.144
21:12:00	0.000	0.000	0.000	0.000	0.144	0.144
21:18:00	0.000	0.000	0.000	0.000	0.143	0.143
21:24:00	0.000	0.000	0.000	0.000	0.142	0.142
21:30:00	0.000	0.000	0.000	0.000	0.141	0.141
21:36:00	0.000	0.000	0.000	0.000	0.140	0.140
21:42:00	0.000	0.000	0.000	0.000	0.140	0.140
21:48:00	0.000	0.000	0.000	0.000	0.139	0.139
21:54:00	0.000	0.000	0.000	0.000	0.138	0.138
22:00:00	0.000	0.000	0.000	0.000	0.137	0.137
22:06:00	0.000	0.000	0.000	0.000	0.137	0.137
22:12:00	0.000	0.000	0.000	0.000	0.136	0.136
22:18:00	0.000	0.000	0.000	0.000	0.135	0.135
22:24:00	0.000	0.000	0.000	0.000	0.134	0.134
22:30:00	0.000	0.000	0.000	0.000	0.134	0.134
22:36:00	0.000	0.000	0.000	0.000	0.133	0.133
22:42:00	0.000	0.000	0.000	0.000	0.132	0.132
22:48:00	0.000	0.000	0.000	0.000	0.132	0.132
22:54:00	0.000	0.000	0.000	0.000	0.131	0.131
23:00:00	0.000	0.000	0.000	0.000	0.130	0.130
23:06:00	0.000	0.000	0.000	0.000	0.129	0.129
23:12:00	0.000	0.000	0.000	0.000	0.129	0.129
23:18:00	0.000	0.000	0.000	0.000	0.128	0.128
23:24:00	0.000	0.000	0.000	0.000	0.127	0.127
23:30:00	0.000	0.000	0.000	0.000	0.127	0.127
23:36:00	0.000	0.000	0.000	0.000	0.126	0.126
23:42:00	0.000	0.000	0.000	0.000	0.125	0.125
23:48:00	0.000	0.000	0.000	0.000	0.125	0.125
23:54:00	0.000	0.000	0.000	0.000	0.124	0.124
24:00:00	0.000	0.000	0.000	0.000	0.123	0.123
24:06:00	0.000	0.000	0.000	0.000	0.123	0.123
24:12:00	0.000	0.000	0.000	0.000	0.122	0.122
24:18:00	0.000	0.000	0.000	0.000	0.121	0.121

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.121	0.121
24:30:00	0.000	0.000	0.000	0.000	0.120	0.120
24:36:00	0.000	0.000	0.000	0.000	0.119	0.119
24:42:00	0.000	0.000	0.000	0.000	0.119	0.119
24:48:00	0.000	0.000	0.000	0.000	0.118	0.118
24:54:00	0.000	0.000	0.000	0.000	0.117	0.117
25:00:00	0.000	0.000	0.000	0.000	0.117	0.117
25:06:00	0.000	0.000	0.000	0.000	0.116	0.116
25:12:00	0.000	0.000	0.000	0.000	0.116	0.116
25:18:00	0.000	0.000	0.000	0.000	0.115	0.115
25:24:00	0.000	0.000	0.000	0.000	0.114	0.114
25:30:00	0.000	0.000	0.000	0.000	0.114	0.114
25:36:00	0.000	0.000	0.000	0.000	0.113	0.113
25:42:00	0.000	0.000	0.000	0.000	0.112	0.112
25:48:00	0.000	0.000	0.000	0.000	0.112	0.112
25:54:00	0.000	0.000	0.000	0.000	0.111	0.111
26:00:00	0.000	0.000	0.000	0.000	0.111	0.111
26:06:00	0.000	0.000	0.000	0.000	0.110	0.110
26:12:00	0.000	0.000	0.000	0.000	0.109	0.109
26:18:00	0.000	0.000	0.000	0.000	0.109	0.109
26:24:00	0.000	0.000	0.000	0.000	0.108	0.108
26:30:00	0.000	0.000	0.000	0.000	0.108	0.108
26:36:00	0.000	0.000	0.000	0.000	0.107	0.107
26:42:00	0.000	0.000	0.000	0.000	0.107	0.107
26:48:00	0.000	0.000	0.000	0.000	0.106	0.106
26:54:00	0.000	0.000	0.000	0.000	0.105	0.105
27:00:00	0.000	0.000	0.000	0.000	0.105	0.105
27:06:00	0.000	0.000	0.000	0.000	0.104	0.104
27:12:00	0.000	0.000	0.000	0.000	0.104	0.104
27:18:00	0.000	0.000	0.000	0.000	0.103	0.103
27:24:00	0.000	0.000	0.000	0.000	0.103	0.103
27:30:00	0.000	0.000	0.000	0.000	0.102	0.102
27:36:00	0.000	0.000	0.000	0.000	0.101	0.101
27:42:00	0.000	0.000	0.000	0.000	0.101	0.101
27:48:00	0.000	0.000	0.000	0.000	0.100	0.100

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.100	0.100
28:00:00	0.000	0.000	0.000	0.000	0.099	0.099
28:06:00	0.000	0.000	0.000	0.000	0.099	0.099
28:12:00	0.000	0.000	0.000	0.000	0.098	0.098
28:18:00	0.000	0.000	0.000	0.000	0.098	0.098
28:24:00	0.000	0.000	0.000	0.000	0.097	0.097
28:30:00	0.000	0.000	0.000	0.000	0.097	0.097
28:36:00	0.000	0.000	0.000	0.000	0.096	0.096
28:42:00	0.000	0.000	0.000	0.000	0.096	0.096

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	1.11 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Quarry Void BOAT 1 Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Quarry Void – BOAT Culvert 1
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – BOAT Culvert 1*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	212.1202
2	243.834
5	345.0072
10	414.561
30	523.5911
50	575.5533
75	618.0674
100	648.9817
100 + 40% CC	954.8089
200	726.1699
1000	939.0232

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 16.435ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:10:26 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site detailsChecksum: DE47-6CAB

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.16 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description:None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	7.11
Total Rainfall (mm):	61.83	Total flow (ML):	10.16
Peak Rainfall (mm):	6.47	Peak flow (m³/s):	0.95

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.
* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
00:00:00	0.512	0.000	0.288	0.000	0.014	0.014
00:06:00	0.643	0.000	0.363	0.000	0.014	0.014
00:12:00	0.807	0.000	0.458	0.002	0.014	0.016
00:18:00	1.013	0.000	0.579	0.004	0.014	0.018
00:24:00	1.269	0.000	0.732	0.009	0.014	0.022
00:30:00	1.588	0.000	0.927	0.015	0.014	0.028
00:36:00	1.985	0.000	1.174	0.023	0.014	0.037
00:42:00	2.476	0.000	1.490	0.035	0.014	0.049
00:48:00	3.082	0.000	1.893	0.051	0.014	0.064
00:54:00	3.825	0.000	2.408	0.071	0.014	0.085
01:00:00	4.721	0.000	3.063	0.098	0.014	0.112
01:06:00	5.761	0.000	3.874	0.133	0.014	0.147
01:12:00	6.468	0.000	4.527	0.176	0.014	0.190
01:18:00	5.761	0.000	4.191	0.230	0.015	0.244
01:24:00	4.721	0.000	3.546	0.294	0.015	0.309
01:30:00	3.825	0.000	2.946	0.367	0.016	0.383
01:36:00	3.082	0.000	2.422	0.445	0.017	0.462
01:42:00	2.476	0.000	1.977	0.526	0.018	0.544
01:48:00	1.985	0.000	1.605	0.608	0.019	0.627
01:54:00	1.588	0.000	1.297	0.687	0.020	0.708
02:00:00	1.269	0.000	1.044	0.760	0.022	0.782
02:06:00	1.013	0.000	0.839	0.824	0.024	0.848
02:12:00	0.807	0.000	0.672	0.875	0.026	0.901
02:18:00	0.643	0.000	0.537	0.909	0.027	0.936
02:24:00	0.512	0.000	0.429	0.924	0.029	0.954
02:30:00	0.000	0.000	0.000	0.923	0.031	0.955
02:36:00	0.000	0.000	0.000	0.909	0.033	0.942
02:42:00	0.000	0.000	0.000	0.883	0.035	0.918
02:48:00	0.000	0.000	0.000	0.847	0.037	0.885
02:54:00	0.000	0.000	0.000	0.805	0.039	0.844
03:00:00	0.000	0.000	0.000	0.759	0.040	0.799
03:06:00	0.000	0.000	0.000	0.709	0.042	0.751
03:12:00	0.000	0.000	0.000	0.658	0.043	0.702
03:18:00	0.000	0.000	0.000	0.608	0.044	0.653

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.559	0.046	0.605
03:30:00	0.000	0.000	0.000	0.512	0.047	0.559
03:36:00	0.000	0.000	0.000	0.467	0.047	0.514
03:42:00	0.000	0.000	0.000	0.424	0.048	0.472
03:48:00	0.000	0.000	0.000	0.384	0.049	0.433
03:54:00	0.000	0.000	0.000	0.346	0.049	0.395
04:00:00	0.000	0.000	0.000	0.310	0.050	0.360
04:06:00	0.000	0.000	0.000	0.275	0.050	0.325
04:12:00	0.000	0.000	0.000	0.242	0.051	0.293
04:18:00	0.000	0.000	0.000	0.210	0.051	0.261
04:24:00	0.000	0.000	0.000	0.180	0.051	0.231
04:30:00	0.000	0.000	0.000	0.152	0.051	0.203
04:36:00	0.000	0.000	0.000	0.126	0.051	0.177
04:42:00	0.000	0.000	0.000	0.102	0.051	0.153
04:48:00	0.000	0.000	0.000	0.080	0.051	0.131
04:54:00	0.000	0.000	0.000	0.062	0.051	0.113
05:00:00	0.000	0.000	0.000	0.047	0.051	0.098
05:06:00	0.000	0.000	0.000	0.035	0.051	0.086
05:12:00	0.000	0.000	0.000	0.026	0.051	0.077
05:18:00	0.000	0.000	0.000	0.019	0.050	0.069
05:24:00	0.000	0.000	0.000	0.013	0.050	0.063
05:30:00	0.000	0.000	0.000	0.009	0.050	0.059
05:36:00	0.000	0.000	0.000	0.006	0.050	0.055
05:42:00	0.000	0.000	0.000	0.003	0.049	0.053
05:48:00	0.000	0.000	0.000	0.002	0.049	0.051
05:54:00	0.000	0.000	0.000	0.001	0.049	0.050
06:00:00	0.000	0.000	0.000	0.000	0.049	0.049
06:06:00	0.000	0.000	0.000	0.000	0.048	0.048
06:12:00	0.000	0.000	0.000	0.000	0.048	0.048
06:18:00	0.000	0.000	0.000	0.000	0.048	0.048
06:24:00	0.000	0.000	0.000	0.000	0.048	0.048
06:30:00	0.000	0.000	0.000	0.000	0.047	0.047
06:36:00	0.000	0.000	0.000	0.000	0.047	0.047
06:42:00	0.000	0.000	0.000	0.000	0.047	0.047
06:48:00	0.000	0.000	0.000	0.000	0.047	0.047

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.046	0.046
07:00:00	0.000	0.000	0.000	0.000	0.046	0.046
07:06:00	0.000	0.000	0.000	0.000	0.046	0.046
07:12:00	0.000	0.000	0.000	0.000	0.046	0.046
07:18:00	0.000	0.000	0.000	0.000	0.045	0.045
07:24:00	0.000	0.000	0.000	0.000	0.045	0.045
07:30:00	0.000	0.000	0.000	0.000	0.045	0.045
07:36:00	0.000	0.000	0.000	0.000	0.045	0.045
07:42:00	0.000	0.000	0.000	0.000	0.044	0.044
07:48:00	0.000	0.000	0.000	0.000	0.044	0.044
07:54:00	0.000	0.000	0.000	0.000	0.044	0.044
08:00:00	0.000	0.000	0.000	0.000	0.044	0.044
08:06:00	0.000	0.000	0.000	0.000	0.043	0.043
08:12:00	0.000	0.000	0.000	0.000	0.043	0.043
08:18:00	0.000	0.000	0.000	0.000	0.043	0.043
08:24:00	0.000	0.000	0.000	0.000	0.043	0.043
08:30:00	0.000	0.000	0.000	0.000	0.042	0.042
08:36:00	0.000	0.000	0.000	0.000	0.042	0.042
08:42:00	0.000	0.000	0.000	0.000	0.042	0.042
08:48:00	0.000	0.000	0.000	0.000	0.042	0.042
08:54:00	0.000	0.000	0.000	0.000	0.042	0.042
09:00:00	0.000	0.000	0.000	0.000	0.041	0.041
09:06:00	0.000	0.000	0.000	0.000	0.041	0.041
09:12:00	0.000	0.000	0.000	0.000	0.041	0.041
09:18:00	0.000	0.000	0.000	0.000	0.041	0.041
09:24:00	0.000	0.000	0.000	0.000	0.040	0.040
09:30:00	0.000	0.000	0.000	0.000	0.040	0.040
09:36:00	0.000	0.000	0.000	0.000	0.040	0.040
09:42:00	0.000	0.000	0.000	0.000	0.040	0.040
09:48:00	0.000	0.000	0.000	0.000	0.040	0.040
09:54:00	0.000	0.000	0.000	0.000	0.039	0.039
10:00:00	0.000	0.000	0.000	0.000	0.039	0.039
10:06:00	0.000	0.000	0.000	0.000	0.039	0.039
10:12:00	0.000	0.000	0.000	0.000	0.039	0.039
10:18:00	0.000	0.000	0.000	0.000	0.038	0.038

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.038	0.038
10:30:00	0.000	0.000	0.000	0.000	0.038	0.038
10:36:00	0.000	0.000	0.000	0.000	0.038	0.038
10:42:00	0.000	0.000	0.000	0.000	0.038	0.038
10:48:00	0.000	0.000	0.000	0.000	0.037	0.037
10:54:00	0.000	0.000	0.000	0.000	0.037	0.037
11:00:00	0.000	0.000	0.000	0.000	0.037	0.037
11:06:00	0.000	0.000	0.000	0.000	0.037	0.037
11:12:00	0.000	0.000	0.000	0.000	0.037	0.037
11:18:00	0.000	0.000	0.000	0.000	0.036	0.036
11:24:00	0.000	0.000	0.000	0.000	0.036	0.036
11:30:00	0.000	0.000	0.000	0.000	0.036	0.036
11:36:00	0.000	0.000	0.000	0.000	0.036	0.036
11:42:00	0.000	0.000	0.000	0.000	0.036	0.036
11:48:00	0.000	0.000	0.000	0.000	0.035	0.035
11:54:00	0.000	0.000	0.000	0.000	0.035	0.035
12:00:00	0.000	0.000	0.000	0.000	0.035	0.035
12:06:00	0.000	0.000	0.000	0.000	0.035	0.035
12:12:00	0.000	0.000	0.000	0.000	0.035	0.035
12:18:00	0.000	0.000	0.000	0.000	0.035	0.035
12:24:00	0.000	0.000	0.000	0.000	0.034	0.034
12:30:00	0.000	0.000	0.000	0.000	0.034	0.034
12:36:00	0.000	0.000	0.000	0.000	0.034	0.034
12:42:00	0.000	0.000	0.000	0.000	0.034	0.034
12:48:00	0.000	0.000	0.000	0.000	0.034	0.034
12:54:00	0.000	0.000	0.000	0.000	0.033	0.033
13:00:00	0.000	0.000	0.000	0.000	0.033	0.033
13:06:00	0.000	0.000	0.000	0.000	0.033	0.033
13:12:00	0.000	0.000	0.000	0.000	0.033	0.033
13:18:00	0.000	0.000	0.000	0.000	0.033	0.033
13:24:00	0.000	0.000	0.000	0.000	0.033	0.033
13:30:00	0.000	0.000	0.000	0.000	0.032	0.032
13:36:00	0.000	0.000	0.000	0.000	0.032	0.032
13:42:00	0.000	0.000	0.000	0.000	0.032	0.032
13:48:00	0.000	0.000	0.000	0.000	0.032	0.032

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.032	0.032
14:00:00	0.000	0.000	0.000	0.000	0.031	0.031
14:06:00	0.000	0.000	0.000	0.000	0.031	0.031
14:12:00	0.000	0.000	0.000	0.000	0.031	0.031
14:18:00	0.000	0.000	0.000	0.000	0.031	0.031
14:24:00	0.000	0.000	0.000	0.000	0.031	0.031
14:30:00	0.000	0.000	0.000	0.000	0.031	0.031
14:36:00	0.000	0.000	0.000	0.000	0.030	0.030
14:42:00	0.000	0.000	0.000	0.000	0.030	0.030
14:48:00	0.000	0.000	0.000	0.000	0.030	0.030
14:54:00	0.000	0.000	0.000	0.000	0.030	0.030
15:00:00	0.000	0.000	0.000	0.000	0.030	0.030
15:06:00	0.000	0.000	0.000	0.000	0.030	0.030
15:12:00	0.000	0.000	0.000	0.000	0.030	0.030
15:18:00	0.000	0.000	0.000	0.000	0.029	0.029
15:24:00	0.000	0.000	0.000	0.000	0.029	0.029
15:30:00	0.000	0.000	0.000	0.000	0.029	0.029
15:36:00	0.000	0.000	0.000	0.000	0.029	0.029
15:42:00	0.000	0.000	0.000	0.000	0.029	0.029
15:48:00	0.000	0.000	0.000	0.000	0.029	0.029
15:54:00	0.000	0.000	0.000	0.000	0.028	0.028
16:00:00	0.000	0.000	0.000	0.000	0.028	0.028
16:06:00	0.000	0.000	0.000	0.000	0.028	0.028
16:12:00	0.000	0.000	0.000	0.000	0.028	0.028
16:18:00	0.000	0.000	0.000	0.000	0.028	0.028
16:24:00	0.000	0.000	0.000	0.000	0.028	0.028
16:30:00	0.000	0.000	0.000	0.000	0.027	0.027
16:36:00	0.000	0.000	0.000	0.000	0.027	0.027
16:42:00	0.000	0.000	0.000	0.000	0.027	0.027
16:48:00	0.000	0.000	0.000	0.000	0.027	0.027
16:54:00	0.000	0.000	0.000	0.000	0.027	0.027
17:00:00	0.000	0.000	0.000	0.000	0.027	0.027
17:06:00	0.000	0.000	0.000	0.000	0.027	0.027
17:12:00	0.000	0.000	0.000	0.000	0.026	0.026
17:18:00	0.000	0.000	0.000	0.000	0.026	0.026

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.026	0.026
17:30:00	0.000	0.000	0.000	0.000	0.026	0.026
17:36:00	0.000	0.000	0.000	0.000	0.026	0.026
17:42:00	0.000	0.000	0.000	0.000	0.026	0.026
17:48:00	0.000	0.000	0.000	0.000	0.026	0.026
17:54:00	0.000	0.000	0.000	0.000	0.025	0.025
18:00:00	0.000	0.000	0.000	0.000	0.025	0.025
18:06:00	0.000	0.000	0.000	0.000	0.025	0.025
18:12:00	0.000	0.000	0.000	0.000	0.025	0.025
18:18:00	0.000	0.000	0.000	0.000	0.025	0.025
18:24:00	0.000	0.000	0.000	0.000	0.025	0.025
18:30:00	0.000	0.000	0.000	0.000	0.025	0.025
18:36:00	0.000	0.000	0.000	0.000	0.025	0.025
18:42:00	0.000	0.000	0.000	0.000	0.024	0.024
18:48:00	0.000	0.000	0.000	0.000	0.024	0.024
18:54:00	0.000	0.000	0.000	0.000	0.024	0.024
19:00:00	0.000	0.000	0.000	0.000	0.024	0.024
19:06:00	0.000	0.000	0.000	0.000	0.024	0.024
19:12:00	0.000	0.000	0.000	0.000	0.024	0.024
19:18:00	0.000	0.000	0.000	0.000	0.024	0.024
19:24:00	0.000	0.000	0.000	0.000	0.024	0.024
19:30:00	0.000	0.000	0.000	0.000	0.023	0.023
19:36:00	0.000	0.000	0.000	0.000	0.023	0.023
19:42:00	0.000	0.000	0.000	0.000	0.023	0.023
19:48:00	0.000	0.000	0.000	0.000	0.023	0.023
19:54:00	0.000	0.000	0.000	0.000	0.023	0.023
20:00:00	0.000	0.000	0.000	0.000	0.023	0.023
20:06:00	0.000	0.000	0.000	0.000	0.023	0.023
20:12:00	0.000	0.000	0.000	0.000	0.023	0.023
20:18:00	0.000	0.000	0.000	0.000	0.022	0.022
20:24:00	0.000	0.000	0.000	0.000	0.022	0.022
20:30:00	0.000	0.000	0.000	0.000	0.022	0.022
20:36:00	0.000	0.000	0.000	0.000	0.022	0.022
20:42:00	0.000	0.000	0.000	0.000	0.022	0.022
20:48:00	0.000	0.000	0.000	0.000	0.022	0.022

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.022	0.022
21:00:00	0.000	0.000	0.000	0.000	0.022	0.022
21:06:00	0.000	0.000	0.000	0.000	0.021	0.021
21:12:00	0.000	0.000	0.000	0.000	0.021	0.021
21:18:00	0.000	0.000	0.000	0.000	0.021	0.021
21:24:00	0.000	0.000	0.000	0.000	0.021	0.021
21:30:00	0.000	0.000	0.000	0.000	0.021	0.021
21:36:00	0.000	0.000	0.000	0.000	0.021	0.021
21:42:00	0.000	0.000	0.000	0.000	0.021	0.021
21:48:00	0.000	0.000	0.000	0.000	0.021	0.021
21:54:00	0.000	0.000	0.000	0.000	0.021	0.021
22:00:00	0.000	0.000	0.000	0.000	0.020	0.020
22:06:00	0.000	0.000	0.000	0.000	0.020	0.020
22:12:00	0.000	0.000	0.000	0.000	0.020	0.020
22:18:00	0.000	0.000	0.000	0.000	0.020	0.020
22:24:00	0.000	0.000	0.000	0.000	0.020	0.020
22:30:00	0.000	0.000	0.000	0.000	0.020	0.020
22:36:00	0.000	0.000	0.000	0.000	0.020	0.020
22:42:00	0.000	0.000	0.000	0.000	0.020	0.020
22:48:00	0.000	0.000	0.000	0.000	0.020	0.020
22:54:00	0.000	0.000	0.000	0.000	0.019	0.019
23:00:00	0.000	0.000	0.000	0.000	0.019	0.019
23:06:00	0.000	0.000	0.000	0.000	0.019	0.019
23:12:00	0.000	0.000	0.000	0.000	0.019	0.019
23:18:00	0.000	0.000	0.000	0.000	0.019	0.019
23:24:00	0.000	0.000	0.000	0.000	0.019	0.019
23:30:00	0.000	0.000	0.000	0.000	0.019	0.019
23:36:00	0.000	0.000	0.000	0.000	0.019	0.019
23:42:00	0.000	0.000	0.000	0.000	0.019	0.019
23:48:00	0.000	0.000	0.000	0.000	0.019	0.019
23:54:00	0.000	0.000	0.000	0.000	0.018	0.018
24:00:00	0.000	0.000	0.000	0.000	0.018	0.018
24:06:00	0.000	0.000	0.000	0.000	0.018	0.018
24:12:00	0.000	0.000	0.000	0.000	0.018	0.018
24:18:00	0.000	0.000	0.000	0.000	0.018	0.018

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.018	0.018
24:30:00	0.000	0.000	0.000	0.000	0.018	0.018
24:36:00	0.000	0.000	0.000	0.000	0.018	0.018
24:42:00	0.000	0.000	0.000	0.000	0.018	0.018
24:48:00	0.000	0.000	0.000	0.000	0.018	0.018
24:54:00	0.000	0.000	0.000	0.000	0.017	0.017
25:00:00	0.000	0.000	0.000	0.000	0.017	0.017
25:06:00	0.000	0.000	0.000	0.000	0.017	0.017
25:12:00	0.000	0.000	0.000	0.000	0.017	0.017
25:18:00	0.000	0.000	0.000	0.000	0.017	0.017
25:24:00	0.000	0.000	0.000	0.000	0.017	0.017
25:30:00	0.000	0.000	0.000	0.000	0.017	0.017
25:36:00	0.000	0.000	0.000	0.000	0.017	0.017
25:42:00	0.000	0.000	0.000	0.000	0.017	0.017
25:48:00	0.000	0.000	0.000	0.000	0.017	0.017
25:54:00	0.000	0.000	0.000	0.000	0.017	0.017
26:00:00	0.000	0.000	0.000	0.000	0.016	0.016
26:06:00	0.000	0.000	0.000	0.000	0.016	0.016
26:12:00	0.000	0.000	0.000	0.000	0.016	0.016
26:18:00	0.000	0.000	0.000	0.000	0.016	0.016
26:24:00	0.000	0.000	0.000	0.000	0.016	0.016
26:30:00	0.000	0.000	0.000	0.000	0.016	0.016
26:36:00	0.000	0.000	0.000	0.000	0.016	0.016
26:42:00	0.000	0.000	0.000	0.000	0.016	0.016
26:48:00	0.000	0.000	0.000	0.000	0.016	0.016
26:54:00	0.000	0.000	0.000	0.000	0.016	0.016
27:00:00	0.000	0.000	0.000	0.000	0.016	0.016
27:06:00	0.000	0.000	0.000	0.000	0.015	0.015
27:12:00	0.000	0.000	0.000	0.000	0.015	0.015
27:18:00	0.000	0.000	0.000	0.000	0.015	0.015
27:24:00	0.000	0.000	0.000	0.000	0.015	0.015
27:30:00	0.000	0.000	0.000	0.000	0.015	0.015
27:36:00	0.000	0.000	0.000	0.000	0.015	0.015
27:42:00	0.000	0.000	0.000	0.000	0.015	0.015
27:48:00	0.000	0.000	0.000	0.000	0.015	0.015

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.015	0.015
28:00:00	0.000	0.000	0.000	0.000	0.015	0.015
28:06:00	0.000	0.000	0.000	0.000	0.015	0.015
28:12:00	0.000	0.000	0.000	0.000	0.015	0.015
28:18:00	0.000	0.000	0.000	0.000	0.015	0.015
28:24:00	0.000	0.000	0.000	0.000	0.014	0.014
28:30:00	0.000	0.000	0.000	0.000	0.014	0.014
28:36:00	0.000	0.000	0.000	0.000	0.014	0.014
28:42:00	0.000	0.000	0.000	0.000	0.014	0.014
28:48:00	0.000	0.000	0.000	0.000	0.014	0.014

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.16 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Quarry Void BOAT 2 Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Quarry Void – BOAT Culvert 2
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
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ReFH2 RUNOFF RATES – BOAT Culvert 2*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	161.1947
2	185.2987
5	262.1976
10	315.0659
30	397.9437
50	437.4435
75	469.7617
100	493.2624
100 + 40% CC	725.7668
200	551.9447
1000	713.7654

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 12.472ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:12:27 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: AE33-1826

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.12 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	5.41
Total Rainfall (mm):	61.92	Total flow (ML):	7.72
Peak Rainfall (mm):	6.48	Peak flow (m ³ /s):	0.73

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.513	0.000	0.288	0.000	0.011	0.011
00:06:00	0.644	0.000	0.364	0.000	0.011	0.011
00:12:00	0.809	0.000	0.459	0.001	0.011	0.012
00:18:00	1.014	0.000	0.580	0.003	0.010	0.014
00:24:00	1.271	0.000	0.733	0.007	0.010	0.017
00:30:00	1.590	0.000	0.928	0.011	0.010	0.022
00:36:00	1.988	0.000	1.176	0.018	0.010	0.028
00:42:00	2.480	0.000	1.492	0.027	0.010	0.037
00:48:00	3.087	0.000	1.896	0.038	0.010	0.049
00:54:00	3.830	0.000	2.412	0.054	0.010	0.065
01:00:00	4.728	0.000	3.068	0.075	0.011	0.085
01:06:00	5.769	0.000	3.880	0.101	0.011	0.111
01:12:00	6.477	0.000	4.535	0.134	0.011	0.145
01:18:00	5.769	0.000	4.199	0.175	0.011	0.186
01:24:00	4.728	0.000	3.552	0.223	0.012	0.235
01:30:00	3.830	0.000	2.952	0.279	0.012	0.291
01:36:00	3.087	0.000	2.427	0.338	0.013	0.351
01:42:00	2.480	0.000	1.981	0.400	0.014	0.414
01:48:00	1.988	0.000	1.608	0.462	0.014	0.477
01:54:00	1.590	0.000	1.299	0.522	0.016	0.538
02:00:00	1.271	0.000	1.046	0.578	0.017	0.595
02:06:00	1.014	0.000	0.840	0.627	0.018	0.645
02:12:00	0.809	0.000	0.673	0.665	0.019	0.685
02:18:00	0.644	0.000	0.538	0.691	0.021	0.712
02:24:00	0.513	0.000	0.430	0.702	0.022	0.725
02:30:00	0.000	0.000	0.000	0.702	0.024	0.726
02:36:00	0.000	0.000	0.000	0.691	0.025	0.716
02:42:00	0.000	0.000	0.000	0.671	0.027	0.698
02:48:00	0.000	0.000	0.000	0.644	0.028	0.672
02:54:00	0.000	0.000	0.000	0.612	0.029	0.642
03:00:00	0.000	0.000	0.000	0.577	0.031	0.607
03:06:00	0.000	0.000	0.000	0.539	0.032	0.571
03:12:00	0.000	0.000	0.000	0.500	0.033	0.533
03:18:00	0.000	0.000	0.000	0.462	0.034	0.496

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.425	0.035	0.460
03:30:00	0.000	0.000	0.000	0.389	0.035	0.425
03:36:00	0.000	0.000	0.000	0.355	0.036	0.391
03:42:00	0.000	0.000	0.000	0.322	0.037	0.359
03:48:00	0.000	0.000	0.000	0.292	0.037	0.329
03:54:00	0.000	0.000	0.000	0.263	0.038	0.301
04:00:00	0.000	0.000	0.000	0.235	0.038	0.273
04:06:00	0.000	0.000	0.000	0.209	0.038	0.247
04:12:00	0.000	0.000	0.000	0.184	0.039	0.222
04:18:00	0.000	0.000	0.000	0.160	0.039	0.199
04:24:00	0.000	0.000	0.000	0.137	0.039	0.176
04:30:00	0.000	0.000	0.000	0.116	0.039	0.155
04:36:00	0.000	0.000	0.000	0.096	0.039	0.135
04:42:00	0.000	0.000	0.000	0.077	0.039	0.116
04:48:00	0.000	0.000	0.000	0.061	0.039	0.100
04:54:00	0.000	0.000	0.000	0.047	0.039	0.086
05:00:00	0.000	0.000	0.000	0.036	0.039	0.075
05:06:00	0.000	0.000	0.000	0.027	0.039	0.065
05:12:00	0.000	0.000	0.000	0.020	0.038	0.058
05:18:00	0.000	0.000	0.000	0.014	0.038	0.052
05:24:00	0.000	0.000	0.000	0.010	0.038	0.048
05:30:00	0.000	0.000	0.000	0.007	0.038	0.044
05:36:00	0.000	0.000	0.000	0.004	0.038	0.042
05:42:00	0.000	0.000	0.000	0.002	0.037	0.040
05:48:00	0.000	0.000	0.000	0.001	0.037	0.039
05:54:00	0.000	0.000	0.000	0.001	0.037	0.038
06:00:00	0.000	0.000	0.000	0.000	0.037	0.037
06:06:00	0.000	0.000	0.000	0.000	0.037	0.037
06:12:00	0.000	0.000	0.000	0.000	0.036	0.036
06:18:00	0.000	0.000	0.000	0.000	0.036	0.036
06:24:00	0.000	0.000	0.000	0.000	0.036	0.036
06:30:00	0.000	0.000	0.000	0.000	0.036	0.036
06:36:00	0.000	0.000	0.000	0.000	0.036	0.036
06:42:00	0.000	0.000	0.000	0.000	0.036	0.036
06:48:00	0.000	0.000	0.000	0.000	0.035	0.035

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.035	0.035
07:00:00	0.000	0.000	0.000	0.000	0.035	0.035
07:06:00	0.000	0.000	0.000	0.000	0.035	0.035
07:12:00	0.000	0.000	0.000	0.000	0.035	0.035
07:18:00	0.000	0.000	0.000	0.000	0.034	0.034
07:24:00	0.000	0.000	0.000	0.000	0.034	0.034
07:30:00	0.000	0.000	0.000	0.000	0.034	0.034
07:36:00	0.000	0.000	0.000	0.000	0.034	0.034
07:42:00	0.000	0.000	0.000	0.000	0.034	0.034
07:48:00	0.000	0.000	0.000	0.000	0.033	0.033
07:54:00	0.000	0.000	0.000	0.000	0.033	0.033
08:00:00	0.000	0.000	0.000	0.000	0.033	0.033
08:06:00	0.000	0.000	0.000	0.000	0.033	0.033
08:12:00	0.000	0.000	0.000	0.000	0.033	0.033
08:18:00	0.000	0.000	0.000	0.000	0.033	0.033
08:24:00	0.000	0.000	0.000	0.000	0.032	0.032
08:30:00	0.000	0.000	0.000	0.000	0.032	0.032
08:36:00	0.000	0.000	0.000	0.000	0.032	0.032
08:42:00	0.000	0.000	0.000	0.000	0.032	0.032
08:48:00	0.000	0.000	0.000	0.000	0.032	0.032
08:54:00	0.000	0.000	0.000	0.000	0.032	0.032
09:00:00	0.000	0.000	0.000	0.000	0.031	0.031
09:06:00	0.000	0.000	0.000	0.000	0.031	0.031
09:12:00	0.000	0.000	0.000	0.000	0.031	0.031
09:18:00	0.000	0.000	0.000	0.000	0.031	0.031
09:24:00	0.000	0.000	0.000	0.000	0.031	0.031
09:30:00	0.000	0.000	0.000	0.000	0.031	0.031
09:36:00	0.000	0.000	0.000	0.000	0.030	0.030
09:42:00	0.000	0.000	0.000	0.000	0.030	0.030
09:48:00	0.000	0.000	0.000	0.000	0.030	0.030
09:54:00	0.000	0.000	0.000	0.000	0.030	0.030
10:00:00	0.000	0.000	0.000	0.000	0.030	0.030
10:06:00	0.000	0.000	0.000	0.000	0.030	0.030
10:12:00	0.000	0.000	0.000	0.000	0.029	0.029
10:18:00	0.000	0.000	0.000	0.000	0.029	0.029

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.029	0.029
10:30:00	0.000	0.000	0.000	0.000	0.029	0.029
10:36:00	0.000	0.000	0.000	0.000	0.029	0.029
10:42:00	0.000	0.000	0.000	0.000	0.029	0.029
10:48:00	0.000	0.000	0.000	0.000	0.028	0.028
10:54:00	0.000	0.000	0.000	0.000	0.028	0.028
11:00:00	0.000	0.000	0.000	0.000	0.028	0.028
11:06:00	0.000	0.000	0.000	0.000	0.028	0.028
11:12:00	0.000	0.000	0.000	0.000	0.028	0.028
11:18:00	0.000	0.000	0.000	0.000	0.028	0.028
11:24:00	0.000	0.000	0.000	0.000	0.028	0.028
11:30:00	0.000	0.000	0.000	0.000	0.027	0.027
11:36:00	0.000	0.000	0.000	0.000	0.027	0.027
11:42:00	0.000	0.000	0.000	0.000	0.027	0.027
11:48:00	0.000	0.000	0.000	0.000	0.027	0.027
11:54:00	0.000	0.000	0.000	0.000	0.027	0.027
12:00:00	0.000	0.000	0.000	0.000	0.027	0.027
12:06:00	0.000	0.000	0.000	0.000	0.027	0.027
12:12:00	0.000	0.000	0.000	0.000	0.026	0.026
12:18:00	0.000	0.000	0.000	0.000	0.026	0.026
12:24:00	0.000	0.000	0.000	0.000	0.026	0.026
12:30:00	0.000	0.000	0.000	0.000	0.026	0.026
12:36:00	0.000	0.000	0.000	0.000	0.026	0.026
12:42:00	0.000	0.000	0.000	0.000	0.026	0.026
12:48:00	0.000	0.000	0.000	0.000	0.026	0.026
12:54:00	0.000	0.000	0.000	0.000	0.025	0.025
13:00:00	0.000	0.000	0.000	0.000	0.025	0.025
13:06:00	0.000	0.000	0.000	0.000	0.025	0.025
13:12:00	0.000	0.000	0.000	0.000	0.025	0.025
13:18:00	0.000	0.000	0.000	0.000	0.025	0.025
13:24:00	0.000	0.000	0.000	0.000	0.025	0.025
13:30:00	0.000	0.000	0.000	0.000	0.025	0.025
13:36:00	0.000	0.000	0.000	0.000	0.024	0.024
13:42:00	0.000	0.000	0.000	0.000	0.024	0.024
13:48:00	0.000	0.000	0.000	0.000	0.024	0.024

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.024	0.024
14:00:00	0.000	0.000	0.000	0.000	0.024	0.024
14:06:00	0.000	0.000	0.000	0.000	0.024	0.024
14:12:00	0.000	0.000	0.000	0.000	0.024	0.024
14:18:00	0.000	0.000	0.000	0.000	0.024	0.024
14:24:00	0.000	0.000	0.000	0.000	0.023	0.023
14:30:00	0.000	0.000	0.000	0.000	0.023	0.023
14:36:00	0.000	0.000	0.000	0.000	0.023	0.023
14:42:00	0.000	0.000	0.000	0.000	0.023	0.023
14:48:00	0.000	0.000	0.000	0.000	0.023	0.023
14:54:00	0.000	0.000	0.000	0.000	0.023	0.023
15:00:00	0.000	0.000	0.000	0.000	0.023	0.023
15:06:00	0.000	0.000	0.000	0.000	0.023	0.023
15:12:00	0.000	0.000	0.000	0.000	0.022	0.022
15:18:00	0.000	0.000	0.000	0.000	0.022	0.022
15:24:00	0.000	0.000	0.000	0.000	0.022	0.022
15:30:00	0.000	0.000	0.000	0.000	0.022	0.022
15:36:00	0.000	0.000	0.000	0.000	0.022	0.022
15:42:00	0.000	0.000	0.000	0.000	0.022	0.022
15:48:00	0.000	0.000	0.000	0.000	0.022	0.022
15:54:00	0.000	0.000	0.000	0.000	0.022	0.022
16:00:00	0.000	0.000	0.000	0.000	0.021	0.021
16:06:00	0.000	0.000	0.000	0.000	0.021	0.021
16:12:00	0.000	0.000	0.000	0.000	0.021	0.021
16:18:00	0.000	0.000	0.000	0.000	0.021	0.021
16:24:00	0.000	0.000	0.000	0.000	0.021	0.021
16:30:00	0.000	0.000	0.000	0.000	0.021	0.021
16:36:00	0.000	0.000	0.000	0.000	0.021	0.021
16:42:00	0.000	0.000	0.000	0.000	0.021	0.021
16:48:00	0.000	0.000	0.000	0.000	0.021	0.021
16:54:00	0.000	0.000	0.000	0.000	0.020	0.020
17:00:00	0.000	0.000	0.000	0.000	0.020	0.020
17:06:00	0.000	0.000	0.000	0.000	0.020	0.020
17:12:00	0.000	0.000	0.000	0.000	0.020	0.020
17:18:00	0.000	0.000	0.000	0.000	0.020	0.020

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.020	0.020
17:30:00	0.000	0.000	0.000	0.000	0.020	0.020
17:36:00	0.000	0.000	0.000	0.000	0.020	0.020
17:42:00	0.000	0.000	0.000	0.000	0.020	0.020
17:48:00	0.000	0.000	0.000	0.000	0.019	0.019
17:54:00	0.000	0.000	0.000	0.000	0.019	0.019
18:00:00	0.000	0.000	0.000	0.000	0.019	0.019
18:06:00	0.000	0.000	0.000	0.000	0.019	0.019
18:12:00	0.000	0.000	0.000	0.000	0.019	0.019
18:18:00	0.000	0.000	0.000	0.000	0.019	0.019
18:24:00	0.000	0.000	0.000	0.000	0.019	0.019
18:30:00	0.000	0.000	0.000	0.000	0.019	0.019
18:36:00	0.000	0.000	0.000	0.000	0.019	0.019
18:42:00	0.000	0.000	0.000	0.000	0.019	0.019
18:48:00	0.000	0.000	0.000	0.000	0.018	0.018
18:54:00	0.000	0.000	0.000	0.000	0.018	0.018
19:00:00	0.000	0.000	0.000	0.000	0.018	0.018
19:06:00	0.000	0.000	0.000	0.000	0.018	0.018
19:12:00	0.000	0.000	0.000	0.000	0.018	0.018
19:18:00	0.000	0.000	0.000	0.000	0.018	0.018
19:24:00	0.000	0.000	0.000	0.000	0.018	0.018
19:30:00	0.000	0.000	0.000	0.000	0.018	0.018
19:36:00	0.000	0.000	0.000	0.000	0.018	0.018
19:42:00	0.000	0.000	0.000	0.000	0.018	0.018
19:48:00	0.000	0.000	0.000	0.000	0.017	0.017
19:54:00	0.000	0.000	0.000	0.000	0.017	0.017
20:00:00	0.000	0.000	0.000	0.000	0.017	0.017
20:06:00	0.000	0.000	0.000	0.000	0.017	0.017
20:12:00	0.000	0.000	0.000	0.000	0.017	0.017
20:18:00	0.000	0.000	0.000	0.000	0.017	0.017
20:24:00	0.000	0.000	0.000	0.000	0.017	0.017
20:30:00	0.000	0.000	0.000	0.000	0.017	0.017
20:36:00	0.000	0.000	0.000	0.000	0.017	0.017
20:42:00	0.000	0.000	0.000	0.000	0.017	0.017
20:48:00	0.000	0.000	0.000	0.000	0.017	0.017

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.016	0.016
21:00:00	0.000	0.000	0.000	0.000	0.016	0.016
21:06:00	0.000	0.000	0.000	0.000	0.016	0.016
21:12:00	0.000	0.000	0.000	0.000	0.016	0.016
21:18:00	0.000	0.000	0.000	0.000	0.016	0.016
21:24:00	0.000	0.000	0.000	0.000	0.016	0.016
21:30:00	0.000	0.000	0.000	0.000	0.016	0.016
21:36:00	0.000	0.000	0.000	0.000	0.016	0.016
21:42:00	0.000	0.000	0.000	0.000	0.016	0.016
21:48:00	0.000	0.000	0.000	0.000	0.016	0.016
21:54:00	0.000	0.000	0.000	0.000	0.016	0.016
22:00:00	0.000	0.000	0.000	0.000	0.016	0.016
22:06:00	0.000	0.000	0.000	0.000	0.015	0.015
22:12:00	0.000	0.000	0.000	0.000	0.015	0.015
22:18:00	0.000	0.000	0.000	0.000	0.015	0.015
22:24:00	0.000	0.000	0.000	0.000	0.015	0.015
22:30:00	0.000	0.000	0.000	0.000	0.015	0.015
22:36:00	0.000	0.000	0.000	0.000	0.015	0.015
22:42:00	0.000	0.000	0.000	0.000	0.015	0.015
22:48:00	0.000	0.000	0.000	0.000	0.015	0.015
22:54:00	0.000	0.000	0.000	0.000	0.015	0.015
23:00:00	0.000	0.000	0.000	0.000	0.015	0.015
23:06:00	0.000	0.000	0.000	0.000	0.015	0.015
23:12:00	0.000	0.000	0.000	0.000	0.015	0.015
23:18:00	0.000	0.000	0.000	0.000	0.014	0.014
23:24:00	0.000	0.000	0.000	0.000	0.014	0.014
23:30:00	0.000	0.000	0.000	0.000	0.014	0.014
23:36:00	0.000	0.000	0.000	0.000	0.014	0.014
23:42:00	0.000	0.000	0.000	0.000	0.014	0.014
23:48:00	0.000	0.000	0.000	0.000	0.014	0.014
23:54:00	0.000	0.000	0.000	0.000	0.014	0.014
24:00:00	0.000	0.000	0.000	0.000	0.014	0.014
24:06:00	0.000	0.000	0.000	0.000	0.014	0.014
24:12:00	0.000	0.000	0.000	0.000	0.014	0.014
24:18:00	0.000	0.000	0.000	0.000	0.014	0.014

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.014	0.014
24:30:00	0.000	0.000	0.000	0.000	0.014	0.014
24:36:00	0.000	0.000	0.000	0.000	0.013	0.013
24:42:00	0.000	0.000	0.000	0.000	0.013	0.013
24:48:00	0.000	0.000	0.000	0.000	0.013	0.013
24:54:00	0.000	0.000	0.000	0.000	0.013	0.013
25:00:00	0.000	0.000	0.000	0.000	0.013	0.013
25:06:00	0.000	0.000	0.000	0.000	0.013	0.013
25:12:00	0.000	0.000	0.000	0.000	0.013	0.013
25:18:00	0.000	0.000	0.000	0.000	0.013	0.013
25:24:00	0.000	0.000	0.000	0.000	0.013	0.013
25:30:00	0.000	0.000	0.000	0.000	0.013	0.013
25:36:00	0.000	0.000	0.000	0.000	0.013	0.013
25:42:00	0.000	0.000	0.000	0.000	0.013	0.013
25:48:00	0.000	0.000	0.000	0.000	0.013	0.013
25:54:00	0.000	0.000	0.000	0.000	0.013	0.013
26:00:00	0.000	0.000	0.000	0.000	0.012	0.012
26:06:00	0.000	0.000	0.000	0.000	0.012	0.012
26:12:00	0.000	0.000	0.000	0.000	0.012	0.012
26:18:00	0.000	0.000	0.000	0.000	0.012	0.012
26:24:00	0.000	0.000	0.000	0.000	0.012	0.012
26:30:00	0.000	0.000	0.000	0.000	0.012	0.012
26:36:00	0.000	0.000	0.000	0.000	0.012	0.012
26:42:00	0.000	0.000	0.000	0.000	0.012	0.012
26:48:00	0.000	0.000	0.000	0.000	0.012	0.012
26:54:00	0.000	0.000	0.000	0.000	0.012	0.012
27:00:00	0.000	0.000	0.000	0.000	0.012	0.012
27:06:00	0.000	0.000	0.000	0.000	0.012	0.012
27:12:00	0.000	0.000	0.000	0.000	0.012	0.012
27:18:00	0.000	0.000	0.000	0.000	0.012	0.012
27:24:00	0.000	0.000	0.000	0.000	0.012	0.012
27:30:00	0.000	0.000	0.000	0.000	0.012	0.012
27:36:00	0.000	0.000	0.000	0.000	0.011	0.011
27:42:00	0.000	0.000	0.000	0.000	0.011	0.011
27:48:00	0.000	0.000	0.000	0.000	0.011	0.011

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.011	0.011
28:00:00	0.000	0.000	0.000	0.000	0.011	0.011
28:06:00	0.000	0.000	0.000	0.000	0.011	0.011
28:12:00	0.000	0.000	0.000	0.000	0.011	0.011
28:18:00	0.000	0.000	0.000	0.000	0.011	0.011
28:24:00	0.000	0.000	0.000	0.000	0.011	0.011
28:30:00	0.000	0.000	0.000	0.000	0.011	0.011
28:36:00	0.000	0.000	0.000	0.000	0.011	0.011
28:42:00	0.000	0.000	0.000	0.000	0.011	0.011
28:48:00	0.000	0.000	0.000	0.000	0.011	0.011

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.12 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Quarry Void BOAT 3 Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Quarry Void – BOAT Culvert 3
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – BOAT Culvert 3*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	684.1284
2	786.3198
5	1112.262
10	1336.284
30	1687.372
50	1854.664
75	1991.525
100	2091.036
100 + 40% CC	3075.038
200	2339.386
1000	3024.256

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 53.417ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:14:17 by aled.williams

Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 8E1A-EB9B

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.53 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	22.91
Total Rainfall (mm):	61.35	Total flow (ML):	32.77
Peak Rainfall (mm):	6.42	Peak flow (m ³ /s):	3.08

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.05	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
00:00:00	0.508	0.000	0.285	0.000	0.045	0.045
00:06:00	0.638	0.000	0.360	0.001	0.045	0.047
00:12:00	0.801	0.000	0.455	0.006	0.045	0.051
00:18:00	1.005	0.000	0.575	0.014	0.045	0.059
00:24:00	1.259	0.000	0.726	0.028	0.045	0.072
00:30:00	1.576	0.000	0.919	0.047	0.044	0.092
00:36:00	1.969	0.000	1.164	0.075	0.044	0.119
00:42:00	2.457	0.000	1.477	0.113	0.044	0.157
00:48:00	3.059	0.000	1.877	0.163	0.044	0.207
00:54:00	3.795	0.000	2.387	0.230	0.045	0.274
01:00:00	4.684	0.000	3.036	0.317	0.045	0.362
01:06:00	5.716	0.000	3.839	0.428	0.046	0.473
01:12:00	6.418	0.000	4.485	0.567	0.047	0.614
01:18:00	5.716	0.000	4.151	0.740	0.048	0.788
01:24:00	4.684	0.000	3.512	0.947	0.050	0.997
01:30:00	3.795	0.000	2.917	1.181	0.052	1.233
01:36:00	3.059	0.000	2.398	1.434	0.054	1.488
01:42:00	2.457	0.000	1.957	1.696	0.058	1.754
01:48:00	1.969	0.000	1.588	1.959	0.062	2.021
01:54:00	1.576	0.000	1.283	2.213	0.066	2.280
02:00:00	1.259	0.000	1.034	2.449	0.071	2.520
02:06:00	1.005	0.000	0.830	2.655	0.077	2.732
02:12:00	0.801	0.000	0.665	2.818	0.083	2.901
02:18:00	0.638	0.000	0.532	2.926	0.089	3.015
02:24:00	0.508	0.000	0.425	2.976	0.095	3.071
02:30:00	0.000	0.000	0.000	2.973	0.102	3.075
02:36:00	0.000	0.000	0.000	2.926	0.108	3.034
02:42:00	0.000	0.000	0.000	2.842	0.114	2.956
02:48:00	0.000	0.000	0.000	2.728	0.120	2.849
02:54:00	0.000	0.000	0.000	2.593	0.126	2.719
03:00:00	0.000	0.000	0.000	2.442	0.131	2.573
03:06:00	0.000	0.000	0.000	2.283	0.136	2.418
03:12:00	0.000	0.000	0.000	2.119	0.140	2.260
03:18:00	0.000	0.000	0.000	1.958	0.144	2.102

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	1.801	0.148	1.948
03:30:00	0.000	0.000	0.000	1.648	0.151	1.799
03:36:00	0.000	0.000	0.000	1.502	0.154	1.656
03:42:00	0.000	0.000	0.000	1.366	0.156	1.522
03:48:00	0.000	0.000	0.000	1.236	0.158	1.395
03:54:00	0.000	0.000	0.000	1.114	0.160	1.274
04:00:00	0.000	0.000	0.000	0.997	0.162	1.159
04:06:00	0.000	0.000	0.000	0.885	0.163	1.048
04:12:00	0.000	0.000	0.000	0.778	0.164	0.943
04:18:00	0.000	0.000	0.000	0.677	0.165	0.842
04:24:00	0.000	0.000	0.000	0.580	0.166	0.746
04:30:00	0.000	0.000	0.000	0.490	0.166	0.656
04:36:00	0.000	0.000	0.000	0.405	0.166	0.571
04:42:00	0.000	0.000	0.000	0.327	0.166	0.493
04:48:00	0.000	0.000	0.000	0.258	0.166	0.424
04:54:00	0.000	0.000	0.000	0.200	0.166	0.365
05:00:00	0.000	0.000	0.000	0.152	0.165	0.317
05:06:00	0.000	0.000	0.000	0.114	0.164	0.278
05:12:00	0.000	0.000	0.000	0.084	0.164	0.247
05:18:00	0.000	0.000	0.000	0.060	0.163	0.223
05:24:00	0.000	0.000	0.000	0.042	0.162	0.204
05:30:00	0.000	0.000	0.000	0.028	0.162	0.189
05:36:00	0.000	0.000	0.000	0.018	0.161	0.178
05:42:00	0.000	0.000	0.000	0.010	0.160	0.170
05:48:00	0.000	0.000	0.000	0.005	0.159	0.164
05:54:00	0.000	0.000	0.000	0.002	0.158	0.160
06:00:00	0.000	0.000	0.000	0.000	0.157	0.158
06:06:00	0.000	0.000	0.000	0.000	0.156	0.156
06:12:00	0.000	0.000	0.000	0.000	0.156	0.156
06:18:00	0.000	0.000	0.000	0.000	0.155	0.155
06:24:00	0.000	0.000	0.000	0.000	0.154	0.154
06:30:00	0.000	0.000	0.000	0.000	0.153	0.153
06:36:00	0.000	0.000	0.000	0.000	0.152	0.152
06:42:00	0.000	0.000	0.000	0.000	0.151	0.151
06:48:00	0.000	0.000	0.000	0.000	0.151	0.151

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.150	0.150
07:00:00	0.000	0.000	0.000	0.000	0.149	0.149
07:06:00	0.000	0.000	0.000	0.000	0.148	0.148
07:12:00	0.000	0.000	0.000	0.000	0.147	0.147
07:18:00	0.000	0.000	0.000	0.000	0.147	0.147
07:24:00	0.000	0.000	0.000	0.000	0.146	0.146
07:30:00	0.000	0.000	0.000	0.000	0.145	0.145
07:36:00	0.000	0.000	0.000	0.000	0.144	0.144
07:42:00	0.000	0.000	0.000	0.000	0.143	0.143
07:48:00	0.000	0.000	0.000	0.000	0.143	0.143
07:54:00	0.000	0.000	0.000	0.000	0.142	0.142
08:00:00	0.000	0.000	0.000	0.000	0.141	0.141
08:06:00	0.000	0.000	0.000	0.000	0.140	0.140
08:12:00	0.000	0.000	0.000	0.000	0.140	0.140
08:18:00	0.000	0.000	0.000	0.000	0.139	0.139
08:24:00	0.000	0.000	0.000	0.000	0.138	0.138
08:30:00	0.000	0.000	0.000	0.000	0.137	0.137
08:36:00	0.000	0.000	0.000	0.000	0.137	0.137
08:42:00	0.000	0.000	0.000	0.000	0.136	0.136
08:48:00	0.000	0.000	0.000	0.000	0.135	0.135
08:54:00	0.000	0.000	0.000	0.000	0.134	0.134
09:00:00	0.000	0.000	0.000	0.000	0.134	0.134
09:06:00	0.000	0.000	0.000	0.000	0.133	0.133
09:12:00	0.000	0.000	0.000	0.000	0.132	0.132
09:18:00	0.000	0.000	0.000	0.000	0.132	0.132
09:24:00	0.000	0.000	0.000	0.000	0.131	0.131
09:30:00	0.000	0.000	0.000	0.000	0.130	0.130
09:36:00	0.000	0.000	0.000	0.000	0.129	0.129
09:42:00	0.000	0.000	0.000	0.000	0.129	0.129
09:48:00	0.000	0.000	0.000	0.000	0.128	0.128
09:54:00	0.000	0.000	0.000	0.000	0.127	0.127
10:00:00	0.000	0.000	0.000	0.000	0.127	0.127
10:06:00	0.000	0.000	0.000	0.000	0.126	0.126
10:12:00	0.000	0.000	0.000	0.000	0.125	0.125
10:18:00	0.000	0.000	0.000	0.000	0.125	0.125

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.124	0.124
10:30:00	0.000	0.000	0.000	0.000	0.123	0.123
10:36:00	0.000	0.000	0.000	0.000	0.123	0.123
10:42:00	0.000	0.000	0.000	0.000	0.122	0.122
10:48:00	0.000	0.000	0.000	0.000	0.121	0.121
10:54:00	0.000	0.000	0.000	0.000	0.121	0.121
11:00:00	0.000	0.000	0.000	0.000	0.120	0.120
11:06:00	0.000	0.000	0.000	0.000	0.119	0.119
11:12:00	0.000	0.000	0.000	0.000	0.119	0.119
11:18:00	0.000	0.000	0.000	0.000	0.118	0.118
11:24:00	0.000	0.000	0.000	0.000	0.117	0.117
11:30:00	0.000	0.000	0.000	0.000	0.117	0.117
11:36:00	0.000	0.000	0.000	0.000	0.116	0.116
11:42:00	0.000	0.000	0.000	0.000	0.116	0.116
11:48:00	0.000	0.000	0.000	0.000	0.115	0.115
11:54:00	0.000	0.000	0.000	0.000	0.114	0.114
12:00:00	0.000	0.000	0.000	0.000	0.114	0.114
12:06:00	0.000	0.000	0.000	0.000	0.113	0.113
12:12:00	0.000	0.000	0.000	0.000	0.112	0.112
12:18:00	0.000	0.000	0.000	0.000	0.112	0.112
12:24:00	0.000	0.000	0.000	0.000	0.111	0.111
12:30:00	0.000	0.000	0.000	0.000	0.111	0.111
12:36:00	0.000	0.000	0.000	0.000	0.110	0.110
12:42:00	0.000	0.000	0.000	0.000	0.109	0.109
12:48:00	0.000	0.000	0.000	0.000	0.109	0.109
12:54:00	0.000	0.000	0.000	0.000	0.108	0.108
13:00:00	0.000	0.000	0.000	0.000	0.108	0.108
13:06:00	0.000	0.000	0.000	0.000	0.107	0.107
13:12:00	0.000	0.000	0.000	0.000	0.107	0.107
13:18:00	0.000	0.000	0.000	0.000	0.106	0.106
13:24:00	0.000	0.000	0.000	0.000	0.105	0.105
13:30:00	0.000	0.000	0.000	0.000	0.105	0.105
13:36:00	0.000	0.000	0.000	0.000	0.104	0.104
13:42:00	0.000	0.000	0.000	0.000	0.104	0.104
13:48:00	0.000	0.000	0.000	0.000	0.103	0.103

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.103	0.103
14:00:00	0.000	0.000	0.000	0.000	0.102	0.102
14:06:00	0.000	0.000	0.000	0.000	0.101	0.101
14:12:00	0.000	0.000	0.000	0.000	0.101	0.101
14:18:00	0.000	0.000	0.000	0.000	0.100	0.100
14:24:00	0.000	0.000	0.000	0.000	0.100	0.100
14:30:00	0.000	0.000	0.000	0.000	0.099	0.099
14:36:00	0.000	0.000	0.000	0.000	0.099	0.099
14:42:00	0.000	0.000	0.000	0.000	0.098	0.098
14:48:00	0.000	0.000	0.000	0.000	0.098	0.098
14:54:00	0.000	0.000	0.000	0.000	0.097	0.097
15:00:00	0.000	0.000	0.000	0.000	0.097	0.097
15:06:00	0.000	0.000	0.000	0.000	0.096	0.096
15:12:00	0.000	0.000	0.000	0.000	0.096	0.096
15:18:00	0.000	0.000	0.000	0.000	0.095	0.095
15:24:00	0.000	0.000	0.000	0.000	0.095	0.095
15:30:00	0.000	0.000	0.000	0.000	0.094	0.094
15:36:00	0.000	0.000	0.000	0.000	0.094	0.094
15:42:00	0.000	0.000	0.000	0.000	0.093	0.093
15:48:00	0.000	0.000	0.000	0.000	0.093	0.093
15:54:00	0.000	0.000	0.000	0.000	0.092	0.092
16:00:00	0.000	0.000	0.000	0.000	0.092	0.092
16:06:00	0.000	0.000	0.000	0.000	0.091	0.091
16:12:00	0.000	0.000	0.000	0.000	0.091	0.091
16:18:00	0.000	0.000	0.000	0.000	0.090	0.090
16:24:00	0.000	0.000	0.000	0.000	0.090	0.090
16:30:00	0.000	0.000	0.000	0.000	0.089	0.089
16:36:00	0.000	0.000	0.000	0.000	0.089	0.089
16:42:00	0.000	0.000	0.000	0.000	0.088	0.088
16:48:00	0.000	0.000	0.000	0.000	0.088	0.088
16:54:00	0.000	0.000	0.000	0.000	0.087	0.087
17:00:00	0.000	0.000	0.000	0.000	0.087	0.087
17:06:00	0.000	0.000	0.000	0.000	0.086	0.086
17:12:00	0.000	0.000	0.000	0.000	0.086	0.086
17:18:00	0.000	0.000	0.000	0.000	0.085	0.085

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.085	0.085
17:30:00	0.000	0.000	0.000	0.000	0.084	0.084
17:36:00	0.000	0.000	0.000	0.000	0.084	0.084
17:42:00	0.000	0.000	0.000	0.000	0.083	0.083
17:48:00	0.000	0.000	0.000	0.000	0.083	0.083
17:54:00	0.000	0.000	0.000	0.000	0.083	0.083
18:00:00	0.000	0.000	0.000	0.000	0.082	0.082
18:06:00	0.000	0.000	0.000	0.000	0.082	0.082
18:12:00	0.000	0.000	0.000	0.000	0.081	0.081
18:18:00	0.000	0.000	0.000	0.000	0.081	0.081
18:24:00	0.000	0.000	0.000	0.000	0.080	0.080
18:30:00	0.000	0.000	0.000	0.000	0.080	0.080
18:36:00	0.000	0.000	0.000	0.000	0.079	0.079
18:42:00	0.000	0.000	0.000	0.000	0.079	0.079
18:48:00	0.000	0.000	0.000	0.000	0.079	0.079
18:54:00	0.000	0.000	0.000	0.000	0.078	0.078
19:00:00	0.000	0.000	0.000	0.000	0.078	0.078
19:06:00	0.000	0.000	0.000	0.000	0.077	0.077
19:12:00	0.000	0.000	0.000	0.000	0.077	0.077
19:18:00	0.000	0.000	0.000	0.000	0.077	0.077
19:24:00	0.000	0.000	0.000	0.000	0.076	0.076
19:30:00	0.000	0.000	0.000	0.000	0.076	0.076
19:36:00	0.000	0.000	0.000	0.000	0.075	0.075
19:42:00	0.000	0.000	0.000	0.000	0.075	0.075
19:48:00	0.000	0.000	0.000	0.000	0.074	0.074
19:54:00	0.000	0.000	0.000	0.000	0.074	0.074
20:00:00	0.000	0.000	0.000	0.000	0.074	0.074
20:06:00	0.000	0.000	0.000	0.000	0.073	0.073
20:12:00	0.000	0.000	0.000	0.000	0.073	0.073
20:18:00	0.000	0.000	0.000	0.000	0.073	0.073
20:24:00	0.000	0.000	0.000	0.000	0.072	0.072
20:30:00	0.000	0.000	0.000	0.000	0.072	0.072
20:36:00	0.000	0.000	0.000	0.000	0.071	0.071
20:42:00	0.000	0.000	0.000	0.000	0.071	0.071
20:48:00	0.000	0.000	0.000	0.000	0.071	0.071

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.070	0.070
21:00:00	0.000	0.000	0.000	0.000	0.070	0.070
21:06:00	0.000	0.000	0.000	0.000	0.069	0.069
21:12:00	0.000	0.000	0.000	0.000	0.069	0.069
21:18:00	0.000	0.000	0.000	0.000	0.069	0.069
21:24:00	0.000	0.000	0.000	0.000	0.068	0.068
21:30:00	0.000	0.000	0.000	0.000	0.068	0.068
21:36:00	0.000	0.000	0.000	0.000	0.068	0.068
21:42:00	0.000	0.000	0.000	0.000	0.067	0.067
21:48:00	0.000	0.000	0.000	0.000	0.067	0.067
21:54:00	0.000	0.000	0.000	0.000	0.066	0.066
22:00:00	0.000	0.000	0.000	0.000	0.066	0.066
22:06:00	0.000	0.000	0.000	0.000	0.066	0.066
22:12:00	0.000	0.000	0.000	0.000	0.065	0.065
22:18:00	0.000	0.000	0.000	0.000	0.065	0.065
22:24:00	0.000	0.000	0.000	0.000	0.065	0.065
22:30:00	0.000	0.000	0.000	0.000	0.064	0.064
22:36:00	0.000	0.000	0.000	0.000	0.064	0.064
22:42:00	0.000	0.000	0.000	0.000	0.064	0.064
22:48:00	0.000	0.000	0.000	0.000	0.063	0.063
22:54:00	0.000	0.000	0.000	0.000	0.063	0.063
23:00:00	0.000	0.000	0.000	0.000	0.063	0.063
23:06:00	0.000	0.000	0.000	0.000	0.062	0.062
23:12:00	0.000	0.000	0.000	0.000	0.062	0.062
23:18:00	0.000	0.000	0.000	0.000	0.062	0.062
23:24:00	0.000	0.000	0.000	0.000	0.061	0.061
23:30:00	0.000	0.000	0.000	0.000	0.061	0.061
23:36:00	0.000	0.000	0.000	0.000	0.061	0.061
23:42:00	0.000	0.000	0.000	0.000	0.060	0.060
23:48:00	0.000	0.000	0.000	0.000	0.060	0.060
23:54:00	0.000	0.000	0.000	0.000	0.060	0.060
24:00:00	0.000	0.000	0.000	0.000	0.059	0.059
24:06:00	0.000	0.000	0.000	0.000	0.059	0.059
24:12:00	0.000	0.000	0.000	0.000	0.059	0.059
24:18:00	0.000	0.000	0.000	0.000	0.058	0.058

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.058	0.058
24:30:00	0.000	0.000	0.000	0.000	0.058	0.058
24:36:00	0.000	0.000	0.000	0.000	0.057	0.057
24:42:00	0.000	0.000	0.000	0.000	0.057	0.057
24:48:00	0.000	0.000	0.000	0.000	0.057	0.057
24:54:00	0.000	0.000	0.000	0.000	0.057	0.057
25:00:00	0.000	0.000	0.000	0.000	0.056	0.056
25:06:00	0.000	0.000	0.000	0.000	0.056	0.056
25:12:00	0.000	0.000	0.000	0.000	0.056	0.056
25:18:00	0.000	0.000	0.000	0.000	0.055	0.055
25:24:00	0.000	0.000	0.000	0.000	0.055	0.055
25:30:00	0.000	0.000	0.000	0.000	0.055	0.055
25:36:00	0.000	0.000	0.000	0.000	0.054	0.054
25:42:00	0.000	0.000	0.000	0.000	0.054	0.054
25:48:00	0.000	0.000	0.000	0.000	0.054	0.054
25:54:00	0.000	0.000	0.000	0.000	0.054	0.054
26:00:00	0.000	0.000	0.000	0.000	0.053	0.053
26:06:00	0.000	0.000	0.000	0.000	0.053	0.053
26:12:00	0.000	0.000	0.000	0.000	0.053	0.053
26:18:00	0.000	0.000	0.000	0.000	0.052	0.052
26:24:00	0.000	0.000	0.000	0.000	0.052	0.052
26:30:00	0.000	0.000	0.000	0.000	0.052	0.052
26:36:00	0.000	0.000	0.000	0.000	0.052	0.052
26:42:00	0.000	0.000	0.000	0.000	0.051	0.051
26:48:00	0.000	0.000	0.000	0.000	0.051	0.051
26:54:00	0.000	0.000	0.000	0.000	0.051	0.051
27:00:00	0.000	0.000	0.000	0.000	0.050	0.050
27:06:00	0.000	0.000	0.000	0.000	0.050	0.050
27:12:00	0.000	0.000	0.000	0.000	0.050	0.050
27:18:00	0.000	0.000	0.000	0.000	0.050	0.050
27:24:00	0.000	0.000	0.000	0.000	0.049	0.049
27:30:00	0.000	0.000	0.000	0.000	0.049	0.049
27:36:00	0.000	0.000	0.000	0.000	0.049	0.049
27:42:00	0.000	0.000	0.000	0.000	0.049	0.049
27:48:00	0.000	0.000	0.000	0.000	0.048	0.048

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.048	0.048
28:00:00	0.000	0.000	0.000	0.000	0.048	0.048
28:06:00	0.000	0.000	0.000	0.000	0.048	0.048
28:12:00	0.000	0.000	0.000	0.000	0.047	0.047
28:18:00	0.000	0.000	0.000	0.000	0.047	0.047
28:24:00	0.000	0.000	0.000	0.000	0.047	0.047
28:30:00	0.000	0.000	0.000	0.000	0.046	0.046
28:36:00	0.000	0.000	0.000	0.000	0.046	0.046
28:42:00	0.000	0.000	0.000	0.000	0.046	0.046
28:48:00	0.000	0.000	0.000	0.000	0.046	0.046

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.53 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB1 Northern Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB1 Northern
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB1 Northern*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	130.0208
2	149.4655
5	211.5015
10	254.1529
30	321.0163
50	352.8843
75	378.9588
100	397.9193
100 + 40% CC	585.5167
200	445.2675
1000	575.8331

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 10.05ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:03:07 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 1288-A490

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.1 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	4.36
Total Rainfall (mm):	61.98	Total flow (ML):	6.23
Peak Rainfall (mm):	6.48	Peak flow (m ³ /s):	0.59

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.513	0.000	0.288	0.000	0.009	0.009
00:06:00	0.645	0.000	0.364	0.000	0.009	0.009
00:12:00	0.809	0.000	0.460	0.001	0.008	0.010
00:18:00	1.015	0.000	0.581	0.003	0.008	0.011
00:24:00	1.272	0.000	0.734	0.005	0.008	0.014
00:30:00	1.592	0.000	0.929	0.009	0.008	0.017
00:36:00	1.990	0.000	1.177	0.014	0.008	0.023
00:42:00	2.482	0.000	1.493	0.021	0.008	0.030
00:48:00	3.090	0.000	1.898	0.031	0.008	0.039
00:54:00	3.834	0.000	2.415	0.044	0.008	0.052
01:00:00	4.732	0.000	3.072	0.060	0.008	0.069
01:06:00	5.775	0.000	3.885	0.081	0.009	0.090
01:12:00	6.483	0.000	4.540	0.108	0.009	0.117
01:18:00	5.775	0.000	4.204	0.141	0.009	0.150
01:24:00	4.732	0.000	3.557	0.180	0.009	0.190
01:30:00	3.834	0.000	2.955	0.225	0.010	0.234
01:36:00	3.090	0.000	2.430	0.273	0.010	0.283
01:42:00	2.482	0.000	1.983	0.323	0.011	0.334
01:48:00	1.990	0.000	1.610	0.373	0.012	0.384
01:54:00	1.592	0.000	1.301	0.421	0.012	0.434
02:00:00	1.272	0.000	1.048	0.466	0.013	0.480
02:06:00	1.015	0.000	0.841	0.505	0.015	0.520
02:12:00	0.809	0.000	0.674	0.537	0.016	0.552
02:18:00	0.645	0.000	0.539	0.557	0.017	0.574
02:24:00	0.513	0.000	0.430	0.567	0.018	0.585
02:30:00	0.000	0.000	0.000	0.566	0.019	0.586
02:36:00	0.000	0.000	0.000	0.557	0.020	0.578
02:42:00	0.000	0.000	0.000	0.541	0.022	0.563
02:48:00	0.000	0.000	0.000	0.520	0.023	0.542
02:54:00	0.000	0.000	0.000	0.494	0.024	0.518
03:00:00	0.000	0.000	0.000	0.465	0.025	0.490
03:06:00	0.000	0.000	0.000	0.435	0.026	0.461
03:12:00	0.000	0.000	0.000	0.404	0.026	0.430
03:18:00	0.000	0.000	0.000	0.373	0.027	0.400

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.343	0.028	0.371
03:30:00	0.000	0.000	0.000	0.314	0.029	0.343
03:36:00	0.000	0.000	0.000	0.286	0.029	0.315
03:42:00	0.000	0.000	0.000	0.260	0.030	0.290
03:48:00	0.000	0.000	0.000	0.236	0.030	0.265
03:54:00	0.000	0.000	0.000	0.212	0.030	0.242
04:00:00	0.000	0.000	0.000	0.190	0.031	0.220
04:06:00	0.000	0.000	0.000	0.169	0.031	0.199
04:12:00	0.000	0.000	0.000	0.148	0.031	0.179
04:18:00	0.000	0.000	0.000	0.129	0.031	0.160
04:24:00	0.000	0.000	0.000	0.111	0.031	0.142
04:30:00	0.000	0.000	0.000	0.093	0.031	0.125
04:36:00	0.000	0.000	0.000	0.077	0.031	0.109
04:42:00	0.000	0.000	0.000	0.062	0.031	0.094
04:48:00	0.000	0.000	0.000	0.049	0.031	0.081
04:54:00	0.000	0.000	0.000	0.038	0.031	0.069
05:00:00	0.000	0.000	0.000	0.029	0.031	0.060
05:06:00	0.000	0.000	0.000	0.022	0.031	0.053
05:12:00	0.000	0.000	0.000	0.016	0.031	0.047
05:18:00	0.000	0.000	0.000	0.011	0.031	0.042
05:24:00	0.000	0.000	0.000	0.008	0.031	0.039
05:30:00	0.000	0.000	0.000	0.005	0.031	0.036
05:36:00	0.000	0.000	0.000	0.003	0.030	0.034
05:42:00	0.000	0.000	0.000	0.002	0.030	0.032
05:48:00	0.000	0.000	0.000	0.001	0.030	0.031
05:54:00	0.000	0.000	0.000	0.000	0.030	0.030
06:00:00	0.000	0.000	0.000	0.000	0.030	0.030
06:06:00	0.000	0.000	0.000	0.000	0.030	0.030
06:12:00	0.000	0.000	0.000	0.000	0.029	0.029
06:18:00	0.000	0.000	0.000	0.000	0.029	0.029
06:24:00	0.000	0.000	0.000	0.000	0.029	0.029
06:30:00	0.000	0.000	0.000	0.000	0.029	0.029
06:36:00	0.000	0.000	0.000	0.000	0.029	0.029
06:42:00	0.000	0.000	0.000	0.000	0.029	0.029
06:48:00	0.000	0.000	0.000	0.000	0.028	0.028

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.028	0.028
07:00:00	0.000	0.000	0.000	0.000	0.028	0.028
07:06:00	0.000	0.000	0.000	0.000	0.028	0.028
07:12:00	0.000	0.000	0.000	0.000	0.028	0.028
07:18:00	0.000	0.000	0.000	0.000	0.028	0.028
07:24:00	0.000	0.000	0.000	0.000	0.028	0.028
07:30:00	0.000	0.000	0.000	0.000	0.027	0.027
07:36:00	0.000	0.000	0.000	0.000	0.027	0.027
07:42:00	0.000	0.000	0.000	0.000	0.027	0.027
07:48:00	0.000	0.000	0.000	0.000	0.027	0.027
07:54:00	0.000	0.000	0.000	0.000	0.027	0.027
08:00:00	0.000	0.000	0.000	0.000	0.027	0.027
08:06:00	0.000	0.000	0.000	0.000	0.027	0.027
08:12:00	0.000	0.000	0.000	0.000	0.026	0.026
08:18:00	0.000	0.000	0.000	0.000	0.026	0.026
08:24:00	0.000	0.000	0.000	0.000	0.026	0.026
08:30:00	0.000	0.000	0.000	0.000	0.026	0.026
08:36:00	0.000	0.000	0.000	0.000	0.026	0.026
08:42:00	0.000	0.000	0.000	0.000	0.026	0.026
08:48:00	0.000	0.000	0.000	0.000	0.026	0.026
08:54:00	0.000	0.000	0.000	0.000	0.025	0.025
09:00:00	0.000	0.000	0.000	0.000	0.025	0.025
09:06:00	0.000	0.000	0.000	0.000	0.025	0.025
09:12:00	0.000	0.000	0.000	0.000	0.025	0.025
09:18:00	0.000	0.000	0.000	0.000	0.025	0.025
09:24:00	0.000	0.000	0.000	0.000	0.025	0.025
09:30:00	0.000	0.000	0.000	0.000	0.025	0.025
09:36:00	0.000	0.000	0.000	0.000	0.024	0.024
09:42:00	0.000	0.000	0.000	0.000	0.024	0.024
09:48:00	0.000	0.000	0.000	0.000	0.024	0.024
09:54:00	0.000	0.000	0.000	0.000	0.024	0.024
10:00:00	0.000	0.000	0.000	0.000	0.024	0.024
10:06:00	0.000	0.000	0.000	0.000	0.024	0.024
10:12:00	0.000	0.000	0.000	0.000	0.024	0.024
10:18:00	0.000	0.000	0.000	0.000	0.024	0.024

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.023	0.023
10:30:00	0.000	0.000	0.000	0.000	0.023	0.023
10:36:00	0.000	0.000	0.000	0.000	0.023	0.023
10:42:00	0.000	0.000	0.000	0.000	0.023	0.023
10:48:00	0.000	0.000	0.000	0.000	0.023	0.023
10:54:00	0.000	0.000	0.000	0.000	0.023	0.023
11:00:00	0.000	0.000	0.000	0.000	0.023	0.023
11:06:00	0.000	0.000	0.000	0.000	0.023	0.023
11:12:00	0.000	0.000	0.000	0.000	0.022	0.022
11:18:00	0.000	0.000	0.000	0.000	0.022	0.022
11:24:00	0.000	0.000	0.000	0.000	0.022	0.022
11:30:00	0.000	0.000	0.000	0.000	0.022	0.022
11:36:00	0.000	0.000	0.000	0.000	0.022	0.022
11:42:00	0.000	0.000	0.000	0.000	0.022	0.022
11:48:00	0.000	0.000	0.000	0.000	0.022	0.022
11:54:00	0.000	0.000	0.000	0.000	0.022	0.022
12:00:00	0.000	0.000	0.000	0.000	0.021	0.021
12:06:00	0.000	0.000	0.000	0.000	0.021	0.021
12:12:00	0.000	0.000	0.000	0.000	0.021	0.021
12:18:00	0.000	0.000	0.000	0.000	0.021	0.021
12:24:00	0.000	0.000	0.000	0.000	0.021	0.021
12:30:00	0.000	0.000	0.000	0.000	0.021	0.021
12:36:00	0.000	0.000	0.000	0.000	0.021	0.021
12:42:00	0.000	0.000	0.000	0.000	0.021	0.021
12:48:00	0.000	0.000	0.000	0.000	0.021	0.021
12:54:00	0.000	0.000	0.000	0.000	0.020	0.020
13:00:00	0.000	0.000	0.000	0.000	0.020	0.020
13:06:00	0.000	0.000	0.000	0.000	0.020	0.020
13:12:00	0.000	0.000	0.000	0.000	0.020	0.020
13:18:00	0.000	0.000	0.000	0.000	0.020	0.020
13:24:00	0.000	0.000	0.000	0.000	0.020	0.020
13:30:00	0.000	0.000	0.000	0.000	0.020	0.020
13:36:00	0.000	0.000	0.000	0.000	0.020	0.020
13:42:00	0.000	0.000	0.000	0.000	0.020	0.020
13:48:00	0.000	0.000	0.000	0.000	0.019	0.019

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.019	0.019
14:00:00	0.000	0.000	0.000	0.000	0.019	0.019
14:06:00	0.000	0.000	0.000	0.000	0.019	0.019
14:12:00	0.000	0.000	0.000	0.000	0.019	0.019
14:18:00	0.000	0.000	0.000	0.000	0.019	0.019
14:24:00	0.000	0.000	0.000	0.000	0.019	0.019
14:30:00	0.000	0.000	0.000	0.000	0.019	0.019
14:36:00	0.000	0.000	0.000	0.000	0.019	0.019
14:42:00	0.000	0.000	0.000	0.000	0.019	0.019
14:48:00	0.000	0.000	0.000	0.000	0.018	0.018
14:54:00	0.000	0.000	0.000	0.000	0.018	0.018
15:00:00	0.000	0.000	0.000	0.000	0.018	0.018
15:06:00	0.000	0.000	0.000	0.000	0.018	0.018
15:12:00	0.000	0.000	0.000	0.000	0.018	0.018
15:18:00	0.000	0.000	0.000	0.000	0.018	0.018
15:24:00	0.000	0.000	0.000	0.000	0.018	0.018
15:30:00	0.000	0.000	0.000	0.000	0.018	0.018
15:36:00	0.000	0.000	0.000	0.000	0.018	0.018
15:42:00	0.000	0.000	0.000	0.000	0.018	0.018
15:48:00	0.000	0.000	0.000	0.000	0.017	0.017
15:54:00	0.000	0.000	0.000	0.000	0.017	0.017
16:00:00	0.000	0.000	0.000	0.000	0.017	0.017
16:06:00	0.000	0.000	0.000	0.000	0.017	0.017
16:12:00	0.000	0.000	0.000	0.000	0.017	0.017
16:18:00	0.000	0.000	0.000	0.000	0.017	0.017
16:24:00	0.000	0.000	0.000	0.000	0.017	0.017
16:30:00	0.000	0.000	0.000	0.000	0.017	0.017
16:36:00	0.000	0.000	0.000	0.000	0.017	0.017
16:42:00	0.000	0.000	0.000	0.000	0.017	0.017
16:48:00	0.000	0.000	0.000	0.000	0.017	0.017
16:54:00	0.000	0.000	0.000	0.000	0.016	0.016
17:00:00	0.000	0.000	0.000	0.000	0.016	0.016
17:06:00	0.000	0.000	0.000	0.000	0.016	0.016
17:12:00	0.000	0.000	0.000	0.000	0.016	0.016
17:18:00	0.000	0.000	0.000	0.000	0.016	0.016

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.016	0.016
17:30:00	0.000	0.000	0.000	0.000	0.016	0.016
17:36:00	0.000	0.000	0.000	0.000	0.016	0.016
17:42:00	0.000	0.000	0.000	0.000	0.016	0.016
17:48:00	0.000	0.000	0.000	0.000	0.016	0.016
17:54:00	0.000	0.000	0.000	0.000	0.016	0.016
18:00:00	0.000	0.000	0.000	0.000	0.016	0.016
18:06:00	0.000	0.000	0.000	0.000	0.015	0.015
18:12:00	0.000	0.000	0.000	0.000	0.015	0.015
18:18:00	0.000	0.000	0.000	0.000	0.015	0.015
18:24:00	0.000	0.000	0.000	0.000	0.015	0.015
18:30:00	0.000	0.000	0.000	0.000	0.015	0.015
18:36:00	0.000	0.000	0.000	0.000	0.015	0.015
18:42:00	0.000	0.000	0.000	0.000	0.015	0.015
18:48:00	0.000	0.000	0.000	0.000	0.015	0.015
18:54:00	0.000	0.000	0.000	0.000	0.015	0.015
19:00:00	0.000	0.000	0.000	0.000	0.015	0.015
19:06:00	0.000	0.000	0.000	0.000	0.015	0.015
19:12:00	0.000	0.000	0.000	0.000	0.015	0.015
19:18:00	0.000	0.000	0.000	0.000	0.014	0.014
19:24:00	0.000	0.000	0.000	0.000	0.014	0.014
19:30:00	0.000	0.000	0.000	0.000	0.014	0.014
19:36:00	0.000	0.000	0.000	0.000	0.014	0.014
19:42:00	0.000	0.000	0.000	0.000	0.014	0.014
19:48:00	0.000	0.000	0.000	0.000	0.014	0.014
19:54:00	0.000	0.000	0.000	0.000	0.014	0.014
20:00:00	0.000	0.000	0.000	0.000	0.014	0.014
20:06:00	0.000	0.000	0.000	0.000	0.014	0.014
20:12:00	0.000	0.000	0.000	0.000	0.014	0.014
20:18:00	0.000	0.000	0.000	0.000	0.014	0.014
20:24:00	0.000	0.000	0.000	0.000	0.014	0.014
20:30:00	0.000	0.000	0.000	0.000	0.014	0.014
20:36:00	0.000	0.000	0.000	0.000	0.013	0.013
20:42:00	0.000	0.000	0.000	0.000	0.013	0.013
20:48:00	0.000	0.000	0.000	0.000	0.013	0.013

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.013	0.013
21:00:00	0.000	0.000	0.000	0.000	0.013	0.013
21:06:00	0.000	0.000	0.000	0.000	0.013	0.013
21:12:00	0.000	0.000	0.000	0.000	0.013	0.013
21:18:00	0.000	0.000	0.000	0.000	0.013	0.013
21:24:00	0.000	0.000	0.000	0.000	0.013	0.013
21:30:00	0.000	0.000	0.000	0.000	0.013	0.013
21:36:00	0.000	0.000	0.000	0.000	0.013	0.013
21:42:00	0.000	0.000	0.000	0.000	0.013	0.013
21:48:00	0.000	0.000	0.000	0.000	0.013	0.013
21:54:00	0.000	0.000	0.000	0.000	0.013	0.013
22:00:00	0.000	0.000	0.000	0.000	0.012	0.012
22:06:00	0.000	0.000	0.000	0.000	0.012	0.012
22:12:00	0.000	0.000	0.000	0.000	0.012	0.012
22:18:00	0.000	0.000	0.000	0.000	0.012	0.012
22:24:00	0.000	0.000	0.000	0.000	0.012	0.012
22:30:00	0.000	0.000	0.000	0.000	0.012	0.012
22:36:00	0.000	0.000	0.000	0.000	0.012	0.012
22:42:00	0.000	0.000	0.000	0.000	0.012	0.012
22:48:00	0.000	0.000	0.000	0.000	0.012	0.012
22:54:00	0.000	0.000	0.000	0.000	0.012	0.012
23:00:00	0.000	0.000	0.000	0.000	0.012	0.012
23:06:00	0.000	0.000	0.000	0.000	0.012	0.012
23:12:00	0.000	0.000	0.000	0.000	0.012	0.012
23:18:00	0.000	0.000	0.000	0.000	0.012	0.012
23:24:00	0.000	0.000	0.000	0.000	0.012	0.012
23:30:00	0.000	0.000	0.000	0.000	0.012	0.012
23:36:00	0.000	0.000	0.000	0.000	0.011	0.011
23:42:00	0.000	0.000	0.000	0.000	0.011	0.011
23:48:00	0.000	0.000	0.000	0.000	0.011	0.011
23:54:00	0.000	0.000	0.000	0.000	0.011	0.011
24:00:00	0.000	0.000	0.000	0.000	0.011	0.011
24:06:00	0.000	0.000	0.000	0.000	0.011	0.011
24:12:00	0.000	0.000	0.000	0.000	0.011	0.011
24:18:00	0.000	0.000	0.000	0.000	0.011	0.011

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.011	0.011
24:30:00	0.000	0.000	0.000	0.000	0.011	0.011
24:36:00	0.000	0.000	0.000	0.000	0.011	0.011
24:42:00	0.000	0.000	0.000	0.000	0.011	0.011
24:48:00	0.000	0.000	0.000	0.000	0.011	0.011
24:54:00	0.000	0.000	0.000	0.000	0.011	0.011
25:00:00	0.000	0.000	0.000	0.000	0.011	0.011
25:06:00	0.000	0.000	0.000	0.000	0.011	0.011
25:12:00	0.000	0.000	0.000	0.000	0.011	0.011
25:18:00	0.000	0.000	0.000	0.000	0.010	0.010
25:24:00	0.000	0.000	0.000	0.000	0.010	0.010
25:30:00	0.000	0.000	0.000	0.000	0.010	0.010
25:36:00	0.000	0.000	0.000	0.000	0.010	0.010
25:42:00	0.000	0.000	0.000	0.000	0.010	0.010
25:48:00	0.000	0.000	0.000	0.000	0.010	0.010
25:54:00	0.000	0.000	0.000	0.000	0.010	0.010
26:00:00	0.000	0.000	0.000	0.000	0.010	0.010
26:06:00	0.000	0.000	0.000	0.000	0.010	0.010
26:12:00	0.000	0.000	0.000	0.000	0.010	0.010
26:18:00	0.000	0.000	0.000	0.000	0.010	0.010
26:24:00	0.000	0.000	0.000	0.000	0.010	0.010
26:30:00	0.000	0.000	0.000	0.000	0.010	0.010
26:36:00	0.000	0.000	0.000	0.000	0.010	0.010
26:42:00	0.000	0.000	0.000	0.000	0.010	0.010
26:48:00	0.000	0.000	0.000	0.000	0.010	0.010
26:54:00	0.000	0.000	0.000	0.000	0.010	0.010
27:00:00	0.000	0.000	0.000	0.000	0.010	0.010
27:06:00	0.000	0.000	0.000	0.000	0.009	0.009
27:12:00	0.000	0.000	0.000	0.000	0.009	0.009
27:18:00	0.000	0.000	0.000	0.000	0.009	0.009
27:24:00	0.000	0.000	0.000	0.000	0.009	0.009
27:30:00	0.000	0.000	0.000	0.000	0.009	0.009
27:36:00	0.000	0.000	0.000	0.000	0.009	0.009
27:42:00	0.000	0.000	0.000	0.000	0.009	0.009
27:48:00	0.000	0.000	0.000	0.000	0.009	0.009

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.009	0.009
28:00:00	0.000	0.000	0.000	0.000	0.009	0.009
28:06:00	0.000	0.000	0.000	0.000	0.009	0.009
28:12:00	0.000	0.000	0.000	0.000	0.009	0.009
28:18:00	0.000	0.000	0.000	0.000	0.009	0.009
28:24:00	0.000	0.000	0.000	0.000	0.009	0.009
28:30:00	0.000	0.000	0.000	0.000	0.009	0.009
28:36:00	0.000	0.000	0.000	0.000	0.009	0.009
28:42:00	0.000	0.000	0.000	0.000	0.009	0.009
28:48:00	0.000	0.000	0.000	0.000	0.009	0.009
28:54:00	0.000	0.000	0.000	0.000	0.009	0.009

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.1 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Bargoed Taff North East Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Bargoed Taff North Eastern
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – Bargoed Taff North-Eastern*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	523.6163
2	601.85
5	851.3923
10	1022.915
30	1291.743
50	1419.846
75	1524.648
100	1600.85
100 + 40% CC	2354.462
200	1791.054
1000	2315.568

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 40.8ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:23:14 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site detailsChecksum: 0D0B-7955

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.41 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description:None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	17.54
Total Rainfall (mm):	61.48	Total flow (ML):	25.08
Peak Rainfall (mm):	6.43	Peak flow (m³/s):	2.35

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.
* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.03	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.509	0.000	0.286	0.000	0.035	0.035
00:06:00	0.640	0.000	0.361	0.001	0.035	0.036
00:12:00	0.803	0.000	0.456	0.004	0.034	0.039
00:18:00	1.007	0.000	0.576	0.011	0.034	0.045
00:24:00	1.262	0.000	0.728	0.021	0.034	0.055
00:30:00	1.579	0.000	0.921	0.036	0.034	0.070
00:36:00	1.973	0.000	1.167	0.057	0.034	0.091
00:42:00	2.462	0.000	1.481	0.086	0.034	0.120
00:48:00	3.065	0.000	1.881	0.125	0.034	0.159
00:54:00	3.803	0.000	2.393	0.176	0.034	0.210
01:00:00	4.694	0.000	3.044	0.242	0.034	0.277
01:06:00	5.728	0.000	3.848	0.327	0.035	0.362
01:12:00	6.431	0.000	4.496	0.434	0.036	0.470
01:18:00	5.728	0.000	4.162	0.567	0.037	0.603
01:24:00	4.694	0.000	3.521	0.725	0.038	0.763
01:30:00	3.803	0.000	2.925	0.904	0.040	0.944
01:36:00	3.065	0.000	2.405	1.098	0.042	1.139
01:42:00	2.462	0.000	1.962	1.298	0.044	1.343
01:48:00	1.973	0.000	1.593	1.500	0.047	1.547
01:54:00	1.579	0.000	1.287	1.695	0.051	1.745
02:00:00	1.262	0.000	1.036	1.875	0.055	1.930
02:06:00	1.007	0.000	0.832	2.033	0.059	2.091
02:12:00	0.803	0.000	0.667	2.158	0.063	2.221
02:18:00	0.640	0.000	0.533	2.240	0.068	2.309
02:24:00	0.509	0.000	0.426	2.278	0.073	2.351
02:30:00	0.000	0.000	0.000	2.277	0.078	2.354
02:36:00	0.000	0.000	0.000	2.241	0.083	2.323
02:42:00	0.000	0.000	0.000	2.176	0.087	2.264
02:48:00	0.000	0.000	0.000	2.089	0.092	2.181
02:54:00	0.000	0.000	0.000	1.986	0.096	2.082
03:00:00	0.000	0.000	0.000	1.870	0.100	1.970
03:06:00	0.000	0.000	0.000	1.748	0.104	1.852
03:12:00	0.000	0.000	0.000	1.623	0.107	1.730
03:18:00	0.000	0.000	0.000	1.499	0.110	1.609

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	1.379	0.113	1.492
03:30:00	0.000	0.000	0.000	1.262	0.115	1.377
03:36:00	0.000	0.000	0.000	1.151	0.118	1.268
03:42:00	0.000	0.000	0.000	1.046	0.119	1.165
03:48:00	0.000	0.000	0.000	0.947	0.121	1.068
03:54:00	0.000	0.000	0.000	0.853	0.123	0.975
04:00:00	0.000	0.000	0.000	0.763	0.124	0.887
04:06:00	0.000	0.000	0.000	0.678	0.125	0.803
04:12:00	0.000	0.000	0.000	0.596	0.126	0.722
04:18:00	0.000	0.000	0.000	0.518	0.126	0.645
04:24:00	0.000	0.000	0.000	0.444	0.127	0.571
04:30:00	0.000	0.000	0.000	0.375	0.127	0.502
04:36:00	0.000	0.000	0.000	0.310	0.127	0.437
04:42:00	0.000	0.000	0.000	0.251	0.127	0.378
04:48:00	0.000	0.000	0.000	0.198	0.127	0.325
04:54:00	0.000	0.000	0.000	0.153	0.127	0.280
05:00:00	0.000	0.000	0.000	0.116	0.126	0.243
05:06:00	0.000	0.000	0.000	0.087	0.126	0.213
05:12:00	0.000	0.000	0.000	0.064	0.125	0.189
05:18:00	0.000	0.000	0.000	0.046	0.125	0.171
05:24:00	0.000	0.000	0.000	0.032	0.124	0.156
05:30:00	0.000	0.000	0.000	0.021	0.123	0.145
05:36:00	0.000	0.000	0.000	0.014	0.123	0.136
05:42:00	0.000	0.000	0.000	0.008	0.122	0.130
05:48:00	0.000	0.000	0.000	0.004	0.122	0.126
05:54:00	0.000	0.000	0.000	0.002	0.121	0.123
06:00:00	0.000	0.000	0.000	0.000	0.120	0.121
06:06:00	0.000	0.000	0.000	0.000	0.120	0.120
06:12:00	0.000	0.000	0.000	0.000	0.119	0.119
06:18:00	0.000	0.000	0.000	0.000	0.118	0.118
06:24:00	0.000	0.000	0.000	0.000	0.118	0.118
06:30:00	0.000	0.000	0.000	0.000	0.117	0.117
06:36:00	0.000	0.000	0.000	0.000	0.116	0.116
06:42:00	0.000	0.000	0.000	0.000	0.116	0.116
06:48:00	0.000	0.000	0.000	0.000	0.115	0.115

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.115	0.115
07:00:00	0.000	0.000	0.000	0.000	0.114	0.114
07:06:00	0.000	0.000	0.000	0.000	0.113	0.113
07:12:00	0.000	0.000	0.000	0.000	0.113	0.113
07:18:00	0.000	0.000	0.000	0.000	0.112	0.112
07:24:00	0.000	0.000	0.000	0.000	0.111	0.111
07:30:00	0.000	0.000	0.000	0.000	0.111	0.111
07:36:00	0.000	0.000	0.000	0.000	0.110	0.110
07:42:00	0.000	0.000	0.000	0.000	0.110	0.110
07:48:00	0.000	0.000	0.000	0.000	0.109	0.109
07:54:00	0.000	0.000	0.000	0.000	0.109	0.109
08:00:00	0.000	0.000	0.000	0.000	0.108	0.108
08:06:00	0.000	0.000	0.000	0.000	0.107	0.107
08:12:00	0.000	0.000	0.000	0.000	0.107	0.107
08:18:00	0.000	0.000	0.000	0.000	0.106	0.106
08:24:00	0.000	0.000	0.000	0.000	0.106	0.106
08:30:00	0.000	0.000	0.000	0.000	0.105	0.105
08:36:00	0.000	0.000	0.000	0.000	0.104	0.104
08:42:00	0.000	0.000	0.000	0.000	0.104	0.104
08:48:00	0.000	0.000	0.000	0.000	0.103	0.103
08:54:00	0.000	0.000	0.000	0.000	0.103	0.103
09:00:00	0.000	0.000	0.000	0.000	0.102	0.102
09:06:00	0.000	0.000	0.000	0.000	0.102	0.102
09:12:00	0.000	0.000	0.000	0.000	0.101	0.101
09:18:00	0.000	0.000	0.000	0.000	0.101	0.101
09:24:00	0.000	0.000	0.000	0.000	0.100	0.100
09:30:00	0.000	0.000	0.000	0.000	0.100	0.100
09:36:00	0.000	0.000	0.000	0.000	0.099	0.099
09:42:00	0.000	0.000	0.000	0.000	0.098	0.098
09:48:00	0.000	0.000	0.000	0.000	0.098	0.098
09:54:00	0.000	0.000	0.000	0.000	0.097	0.097
10:00:00	0.000	0.000	0.000	0.000	0.097	0.097
10:06:00	0.000	0.000	0.000	0.000	0.096	0.096
10:12:00	0.000	0.000	0.000	0.000	0.096	0.096
10:18:00	0.000	0.000	0.000	0.000	0.095	0.095

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.095	0.095
10:30:00	0.000	0.000	0.000	0.000	0.094	0.094
10:36:00	0.000	0.000	0.000	0.000	0.094	0.094
10:42:00	0.000	0.000	0.000	0.000	0.093	0.093
10:48:00	0.000	0.000	0.000	0.000	0.093	0.093
10:54:00	0.000	0.000	0.000	0.000	0.092	0.092
11:00:00	0.000	0.000	0.000	0.000	0.092	0.092
11:06:00	0.000	0.000	0.000	0.000	0.091	0.091
11:12:00	0.000	0.000	0.000	0.000	0.091	0.091
11:18:00	0.000	0.000	0.000	0.000	0.090	0.090
11:24:00	0.000	0.000	0.000	0.000	0.090	0.090
11:30:00	0.000	0.000	0.000	0.000	0.089	0.089
11:36:00	0.000	0.000	0.000	0.000	0.089	0.089
11:42:00	0.000	0.000	0.000	0.000	0.088	0.088
11:48:00	0.000	0.000	0.000	0.000	0.088	0.088
11:54:00	0.000	0.000	0.000	0.000	0.087	0.087
12:00:00	0.000	0.000	0.000	0.000	0.087	0.087
12:06:00	0.000	0.000	0.000	0.000	0.086	0.086
12:12:00	0.000	0.000	0.000	0.000	0.086	0.086
12:18:00	0.000	0.000	0.000	0.000	0.085	0.085
12:24:00	0.000	0.000	0.000	0.000	0.085	0.085
12:30:00	0.000	0.000	0.000	0.000	0.085	0.085
12:36:00	0.000	0.000	0.000	0.000	0.084	0.084
12:42:00	0.000	0.000	0.000	0.000	0.084	0.084
12:48:00	0.000	0.000	0.000	0.000	0.083	0.083
12:54:00	0.000	0.000	0.000	0.000	0.083	0.083
13:00:00	0.000	0.000	0.000	0.000	0.082	0.082
13:06:00	0.000	0.000	0.000	0.000	0.082	0.082
13:12:00	0.000	0.000	0.000	0.000	0.081	0.081
13:18:00	0.000	0.000	0.000	0.000	0.081	0.081
13:24:00	0.000	0.000	0.000	0.000	0.081	0.081
13:30:00	0.000	0.000	0.000	0.000	0.080	0.080
13:36:00	0.000	0.000	0.000	0.000	0.080	0.080
13:42:00	0.000	0.000	0.000	0.000	0.079	0.079
13:48:00	0.000	0.000	0.000	0.000	0.079	0.079

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.078	0.078
14:00:00	0.000	0.000	0.000	0.000	0.078	0.078
14:06:00	0.000	0.000	0.000	0.000	0.078	0.078
14:12:00	0.000	0.000	0.000	0.000	0.077	0.077
14:18:00	0.000	0.000	0.000	0.000	0.077	0.077
14:24:00	0.000	0.000	0.000	0.000	0.076	0.076
14:30:00	0.000	0.000	0.000	0.000	0.076	0.076
14:36:00	0.000	0.000	0.000	0.000	0.075	0.075
14:42:00	0.000	0.000	0.000	0.000	0.075	0.075
14:48:00	0.000	0.000	0.000	0.000	0.075	0.075
14:54:00	0.000	0.000	0.000	0.000	0.074	0.074
15:00:00	0.000	0.000	0.000	0.000	0.074	0.074
15:06:00	0.000	0.000	0.000	0.000	0.073	0.073
15:12:00	0.000	0.000	0.000	0.000	0.073	0.073
15:18:00	0.000	0.000	0.000	0.000	0.073	0.073
15:24:00	0.000	0.000	0.000	0.000	0.072	0.072
15:30:00	0.000	0.000	0.000	0.000	0.072	0.072
15:36:00	0.000	0.000	0.000	0.000	0.072	0.072
15:42:00	0.000	0.000	0.000	0.000	0.071	0.071
15:48:00	0.000	0.000	0.000	0.000	0.071	0.071
15:54:00	0.000	0.000	0.000	0.000	0.070	0.070
16:00:00	0.000	0.000	0.000	0.000	0.070	0.070
16:06:00	0.000	0.000	0.000	0.000	0.070	0.070
16:12:00	0.000	0.000	0.000	0.000	0.069	0.069
16:18:00	0.000	0.000	0.000	0.000	0.069	0.069
16:24:00	0.000	0.000	0.000	0.000	0.068	0.068
16:30:00	0.000	0.000	0.000	0.000	0.068	0.068
16:36:00	0.000	0.000	0.000	0.000	0.068	0.068
16:42:00	0.000	0.000	0.000	0.000	0.067	0.067
16:48:00	0.000	0.000	0.000	0.000	0.067	0.067
16:54:00	0.000	0.000	0.000	0.000	0.067	0.067
17:00:00	0.000	0.000	0.000	0.000	0.066	0.066
17:06:00	0.000	0.000	0.000	0.000	0.066	0.066
17:12:00	0.000	0.000	0.000	0.000	0.066	0.066
17:18:00	0.000	0.000	0.000	0.000	0.065	0.065

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.065	0.065
17:30:00	0.000	0.000	0.000	0.000	0.065	0.065
17:36:00	0.000	0.000	0.000	0.000	0.064	0.064
17:42:00	0.000	0.000	0.000	0.000	0.064	0.064
17:48:00	0.000	0.000	0.000	0.000	0.063	0.063
17:54:00	0.000	0.000	0.000	0.000	0.063	0.063
18:00:00	0.000	0.000	0.000	0.000	0.063	0.063
18:06:00	0.000	0.000	0.000	0.000	0.062	0.062
18:12:00	0.000	0.000	0.000	0.000	0.062	0.062
18:18:00	0.000	0.000	0.000	0.000	0.062	0.062
18:24:00	0.000	0.000	0.000	0.000	0.061	0.061
18:30:00	0.000	0.000	0.000	0.000	0.061	0.061
18:36:00	0.000	0.000	0.000	0.000	0.061	0.061
18:42:00	0.000	0.000	0.000	0.000	0.060	0.060
18:48:00	0.000	0.000	0.000	0.000	0.060	0.060
18:54:00	0.000	0.000	0.000	0.000	0.060	0.060
19:00:00	0.000	0.000	0.000	0.000	0.059	0.059
19:06:00	0.000	0.000	0.000	0.000	0.059	0.059
19:12:00	0.000	0.000	0.000	0.000	0.059	0.059
19:18:00	0.000	0.000	0.000	0.000	0.059	0.059
19:24:00	0.000	0.000	0.000	0.000	0.058	0.058
19:30:00	0.000	0.000	0.000	0.000	0.058	0.058
19:36:00	0.000	0.000	0.000	0.000	0.058	0.058
19:42:00	0.000	0.000	0.000	0.000	0.057	0.057
19:48:00	0.000	0.000	0.000	0.000	0.057	0.057
19:54:00	0.000	0.000	0.000	0.000	0.057	0.057
20:00:00	0.000	0.000	0.000	0.000	0.056	0.056
20:06:00	0.000	0.000	0.000	0.000	0.056	0.056
20:12:00	0.000	0.000	0.000	0.000	0.056	0.056
20:18:00	0.000	0.000	0.000	0.000	0.055	0.055
20:24:00	0.000	0.000	0.000	0.000	0.055	0.055
20:30:00	0.000	0.000	0.000	0.000	0.055	0.055
20:36:00	0.000	0.000	0.000	0.000	0.055	0.055
20:42:00	0.000	0.000	0.000	0.000	0.054	0.054
20:48:00	0.000	0.000	0.000	0.000	0.054	0.054

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.054	0.054
21:00:00	0.000	0.000	0.000	0.000	0.053	0.053
21:06:00	0.000	0.000	0.000	0.000	0.053	0.053
21:12:00	0.000	0.000	0.000	0.000	0.053	0.053
21:18:00	0.000	0.000	0.000	0.000	0.053	0.053
21:24:00	0.000	0.000	0.000	0.000	0.052	0.052
21:30:00	0.000	0.000	0.000	0.000	0.052	0.052
21:36:00	0.000	0.000	0.000	0.000	0.052	0.052
21:42:00	0.000	0.000	0.000	0.000	0.051	0.051
21:48:00	0.000	0.000	0.000	0.000	0.051	0.051
21:54:00	0.000	0.000	0.000	0.000	0.051	0.051
22:00:00	0.000	0.000	0.000	0.000	0.051	0.051
22:06:00	0.000	0.000	0.000	0.000	0.050	0.050
22:12:00	0.000	0.000	0.000	0.000	0.050	0.050
22:18:00	0.000	0.000	0.000	0.000	0.050	0.050
22:24:00	0.000	0.000	0.000	0.000	0.049	0.049
22:30:00	0.000	0.000	0.000	0.000	0.049	0.049
22:36:00	0.000	0.000	0.000	0.000	0.049	0.049
22:42:00	0.000	0.000	0.000	0.000	0.049	0.049
22:48:00	0.000	0.000	0.000	0.000	0.048	0.048
22:54:00	0.000	0.000	0.000	0.000	0.048	0.048
23:00:00	0.000	0.000	0.000	0.000	0.048	0.048
23:06:00	0.000	0.000	0.000	0.000	0.048	0.048
23:12:00	0.000	0.000	0.000	0.000	0.047	0.047
23:18:00	0.000	0.000	0.000	0.000	0.047	0.047
23:24:00	0.000	0.000	0.000	0.000	0.047	0.047
23:30:00	0.000	0.000	0.000	0.000	0.047	0.047
23:36:00	0.000	0.000	0.000	0.000	0.046	0.046
23:42:00	0.000	0.000	0.000	0.000	0.046	0.046
23:48:00	0.000	0.000	0.000	0.000	0.046	0.046
23:54:00	0.000	0.000	0.000	0.000	0.046	0.046
24:00:00	0.000	0.000	0.000	0.000	0.045	0.045
24:06:00	0.000	0.000	0.000	0.000	0.045	0.045
24:12:00	0.000	0.000	0.000	0.000	0.045	0.045
24:18:00	0.000	0.000	0.000	0.000	0.045	0.045

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.044	0.044
24:30:00	0.000	0.000	0.000	0.000	0.044	0.044
24:36:00	0.000	0.000	0.000	0.000	0.044	0.044
24:42:00	0.000	0.000	0.000	0.000	0.044	0.044
24:48:00	0.000	0.000	0.000	0.000	0.043	0.043
24:54:00	0.000	0.000	0.000	0.000	0.043	0.043
25:00:00	0.000	0.000	0.000	0.000	0.043	0.043
25:06:00	0.000	0.000	0.000	0.000	0.043	0.043
25:12:00	0.000	0.000	0.000	0.000	0.043	0.043
25:18:00	0.000	0.000	0.000	0.000	0.042	0.042
25:24:00	0.000	0.000	0.000	0.000	0.042	0.042
25:30:00	0.000	0.000	0.000	0.000	0.042	0.042
25:36:00	0.000	0.000	0.000	0.000	0.042	0.042
25:42:00	0.000	0.000	0.000	0.000	0.041	0.041
25:48:00	0.000	0.000	0.000	0.000	0.041	0.041
25:54:00	0.000	0.000	0.000	0.000	0.041	0.041
26:00:00	0.000	0.000	0.000	0.000	0.041	0.041
26:06:00	0.000	0.000	0.000	0.000	0.040	0.040
26:12:00	0.000	0.000	0.000	0.000	0.040	0.040
26:18:00	0.000	0.000	0.000	0.000	0.040	0.040
26:24:00	0.000	0.000	0.000	0.000	0.040	0.040
26:30:00	0.000	0.000	0.000	0.000	0.040	0.040
26:36:00	0.000	0.000	0.000	0.000	0.039	0.039
26:42:00	0.000	0.000	0.000	0.000	0.039	0.039
26:48:00	0.000	0.000	0.000	0.000	0.039	0.039
26:54:00	0.000	0.000	0.000	0.000	0.039	0.039
27:00:00	0.000	0.000	0.000	0.000	0.039	0.039
27:06:00	0.000	0.000	0.000	0.000	0.038	0.038
27:12:00	0.000	0.000	0.000	0.000	0.038	0.038
27:18:00	0.000	0.000	0.000	0.000	0.038	0.038
27:24:00	0.000	0.000	0.000	0.000	0.038	0.038
27:30:00	0.000	0.000	0.000	0.000	0.038	0.038
27:36:00	0.000	0.000	0.000	0.000	0.037	0.037
27:42:00	0.000	0.000	0.000	0.000	0.037	0.037
27:48:00	0.000	0.000	0.000	0.000	0.037	0.037

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.037	0.037
28:00:00	0.000	0.000	0.000	0.000	0.037	0.037
28:06:00	0.000	0.000	0.000	0.000	0.036	0.036
28:12:00	0.000	0.000	0.000	0.000	0.036	0.036
28:18:00	0.000	0.000	0.000	0.000	0.036	0.036
28:24:00	0.000	0.000	0.000	0.000	0.036	0.036
28:30:00	0.000	0.000	0.000	0.000	0.036	0.036
28:36:00	0.000	0.000	0.000	0.000	0.035	0.035
28:42:00	0.000	0.000	0.000	0.000	0.035	0.035
28:48:00	0.000	0.000	0.000	0.000	0.035	0.035

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.41 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Bargoed Taff North East Plus Ecological Area Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Bargoed Taff North Eastern + Central Ecology Area
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – Bargoed Taff North-Eastern + Central Ecology Area*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	746.1347
2	857.579
5	1213.027
10	1457.322
30	1840.176
50	2022.602
75	2171.841
100	2280.351
100 + 40% CC	3353.303
200	2551.151
1000	3297.931

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 58.3ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:26:16 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 04AF-0389

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.58 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	24.98
Total Rainfall (mm):	61.31	Total flow (ML):	35.74
Peak Rainfall (mm):	6.41	Peak flow (m ³ /s):	3.35

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.05	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.508	0.000	0.285	0.000	0.050	0.050
00:06:00	0.638	0.000	0.360	0.002	0.049	0.051
00:12:00	0.801	0.000	0.455	0.006	0.049	0.055
00:18:00	1.004	0.000	0.574	0.016	0.049	0.064
00:24:00	1.258	0.000	0.726	0.030	0.049	0.079
00:30:00	1.575	0.000	0.918	0.052	0.048	0.100
00:36:00	1.968	0.000	1.164	0.082	0.048	0.130
00:42:00	2.455	0.000	1.476	0.123	0.048	0.171
00:48:00	3.056	0.000	1.875	0.178	0.048	0.226
00:54:00	3.792	0.000	2.385	0.250	0.049	0.299
01:00:00	4.681	0.000	3.034	0.345	0.049	0.394
01:06:00	5.712	0.000	3.836	0.466	0.050	0.516
01:12:00	6.413	0.000	4.481	0.618	0.051	0.669
01:18:00	5.712	0.000	4.148	0.807	0.052	0.859
01:24:00	4.681	0.000	3.508	1.033	0.054	1.087
01:30:00	3.792	0.000	2.915	1.288	0.056	1.345
01:36:00	3.056	0.000	2.396	1.564	0.059	1.623
01:42:00	2.455	0.000	1.955	1.849	0.063	1.912
01:48:00	1.968	0.000	1.587	2.136	0.067	2.204
01:54:00	1.575	0.000	1.282	2.414	0.072	2.486
02:00:00	1.258	0.000	1.033	2.671	0.078	2.748
02:06:00	1.004	0.000	0.829	2.895	0.084	2.979
02:12:00	0.801	0.000	0.664	3.073	0.090	3.163
02:18:00	0.638	0.000	0.531	3.191	0.097	3.288
02:24:00	0.508	0.000	0.424	3.245	0.104	3.349
02:30:00	0.000	0.000	0.000	3.242	0.111	3.353
02:36:00	0.000	0.000	0.000	3.191	0.118	3.309
02:42:00	0.000	0.000	0.000	3.099	0.125	3.224
02:48:00	0.000	0.000	0.000	2.975	0.131	3.106
02:54:00	0.000	0.000	0.000	2.828	0.137	2.965
03:00:00	0.000	0.000	0.000	2.663	0.143	2.806
03:06:00	0.000	0.000	0.000	2.489	0.148	2.637
03:12:00	0.000	0.000	0.000	2.311	0.153	2.464
03:18:00	0.000	0.000	0.000	2.135	0.157	2.292

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	1.963	0.161	2.125
03:30:00	0.000	0.000	0.000	1.797	0.165	1.962
03:36:00	0.000	0.000	0.000	1.638	0.168	1.806
03:42:00	0.000	0.000	0.000	1.489	0.171	1.660
03:48:00	0.000	0.000	0.000	1.348	0.173	1.521
03:54:00	0.000	0.000	0.000	1.214	0.175	1.389
04:00:00	0.000	0.000	0.000	1.087	0.177	1.263
04:06:00	0.000	0.000	0.000	0.965	0.178	1.143
04:12:00	0.000	0.000	0.000	0.849	0.179	1.028
04:18:00	0.000	0.000	0.000	0.738	0.180	0.918
04:24:00	0.000	0.000	0.000	0.633	0.181	0.814
04:30:00	0.000	0.000	0.000	0.534	0.181	0.715
04:36:00	0.000	0.000	0.000	0.442	0.181	0.623
04:42:00	0.000	0.000	0.000	0.357	0.181	0.538
04:48:00	0.000	0.000	0.000	0.282	0.181	0.463
04:54:00	0.000	0.000	0.000	0.218	0.181	0.398
05:00:00	0.000	0.000	0.000	0.166	0.180	0.346
05:06:00	0.000	0.000	0.000	0.124	0.179	0.303
05:12:00	0.000	0.000	0.000	0.091	0.179	0.270
05:18:00	0.000	0.000	0.000	0.065	0.178	0.243
05:24:00	0.000	0.000	0.000	0.045	0.177	0.223
05:30:00	0.000	0.000	0.000	0.030	0.176	0.207
05:36:00	0.000	0.000	0.000	0.019	0.175	0.195
05:42:00	0.000	0.000	0.000	0.011	0.174	0.186
05:48:00	0.000	0.000	0.000	0.006	0.174	0.179
05:54:00	0.000	0.000	0.000	0.002	0.173	0.175
06:00:00	0.000	0.000	0.000	0.001	0.172	0.172
06:06:00	0.000	0.000	0.000	0.000	0.171	0.171
06:12:00	0.000	0.000	0.000	0.000	0.170	0.170
06:18:00	0.000	0.000	0.000	0.000	0.169	0.169
06:24:00	0.000	0.000	0.000	0.000	0.168	0.168
06:30:00	0.000	0.000	0.000	0.000	0.167	0.167
06:36:00	0.000	0.000	0.000	0.000	0.166	0.166
06:42:00	0.000	0.000	0.000	0.000	0.165	0.165
06:48:00	0.000	0.000	0.000	0.000	0.164	0.164

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.163	0.163
07:00:00	0.000	0.000	0.000	0.000	0.163	0.163
07:06:00	0.000	0.000	0.000	0.000	0.162	0.162
07:12:00	0.000	0.000	0.000	0.000	0.161	0.161
07:18:00	0.000	0.000	0.000	0.000	0.160	0.160
07:24:00	0.000	0.000	0.000	0.000	0.159	0.159
07:30:00	0.000	0.000	0.000	0.000	0.158	0.158
07:36:00	0.000	0.000	0.000	0.000	0.157	0.157
07:42:00	0.000	0.000	0.000	0.000	0.157	0.157
07:48:00	0.000	0.000	0.000	0.000	0.156	0.156
07:54:00	0.000	0.000	0.000	0.000	0.155	0.155
08:00:00	0.000	0.000	0.000	0.000	0.154	0.154
08:06:00	0.000	0.000	0.000	0.000	0.153	0.153
08:12:00	0.000	0.000	0.000	0.000	0.152	0.152
08:18:00	0.000	0.000	0.000	0.000	0.152	0.152
08:24:00	0.000	0.000	0.000	0.000	0.151	0.151
08:30:00	0.000	0.000	0.000	0.000	0.150	0.150
08:36:00	0.000	0.000	0.000	0.000	0.149	0.149
08:42:00	0.000	0.000	0.000	0.000	0.148	0.148
08:48:00	0.000	0.000	0.000	0.000	0.148	0.148
08:54:00	0.000	0.000	0.000	0.000	0.147	0.147
09:00:00	0.000	0.000	0.000	0.000	0.146	0.146
09:06:00	0.000	0.000	0.000	0.000	0.145	0.145
09:12:00	0.000	0.000	0.000	0.000	0.144	0.144
09:18:00	0.000	0.000	0.000	0.000	0.144	0.144
09:24:00	0.000	0.000	0.000	0.000	0.143	0.143
09:30:00	0.000	0.000	0.000	0.000	0.142	0.142
09:36:00	0.000	0.000	0.000	0.000	0.141	0.141
09:42:00	0.000	0.000	0.000	0.000	0.140	0.140
09:48:00	0.000	0.000	0.000	0.000	0.140	0.140
09:54:00	0.000	0.000	0.000	0.000	0.139	0.139
10:00:00	0.000	0.000	0.000	0.000	0.138	0.138
10:06:00	0.000	0.000	0.000	0.000	0.137	0.137
10:12:00	0.000	0.000	0.000	0.000	0.137	0.137
10:18:00	0.000	0.000	0.000	0.000	0.136	0.136

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.135	0.135
10:30:00	0.000	0.000	0.000	0.000	0.135	0.135
10:36:00	0.000	0.000	0.000	0.000	0.134	0.134
10:42:00	0.000	0.000	0.000	0.000	0.133	0.133
10:48:00	0.000	0.000	0.000	0.000	0.132	0.132
10:54:00	0.000	0.000	0.000	0.000	0.132	0.132
11:00:00	0.000	0.000	0.000	0.000	0.131	0.131
11:06:00	0.000	0.000	0.000	0.000	0.130	0.130
11:12:00	0.000	0.000	0.000	0.000	0.130	0.130
11:18:00	0.000	0.000	0.000	0.000	0.129	0.129
11:24:00	0.000	0.000	0.000	0.000	0.128	0.128
11:30:00	0.000	0.000	0.000	0.000	0.127	0.127
11:36:00	0.000	0.000	0.000	0.000	0.127	0.127
11:42:00	0.000	0.000	0.000	0.000	0.126	0.126
11:48:00	0.000	0.000	0.000	0.000	0.125	0.125
11:54:00	0.000	0.000	0.000	0.000	0.125	0.125
12:00:00	0.000	0.000	0.000	0.000	0.124	0.124
12:06:00	0.000	0.000	0.000	0.000	0.123	0.123
12:12:00	0.000	0.000	0.000	0.000	0.123	0.123
12:18:00	0.000	0.000	0.000	0.000	0.122	0.122
12:24:00	0.000	0.000	0.000	0.000	0.121	0.121
12:30:00	0.000	0.000	0.000	0.000	0.121	0.121
12:36:00	0.000	0.000	0.000	0.000	0.120	0.120
12:42:00	0.000	0.000	0.000	0.000	0.119	0.119
12:48:00	0.000	0.000	0.000	0.000	0.119	0.119
12:54:00	0.000	0.000	0.000	0.000	0.118	0.118
13:00:00	0.000	0.000	0.000	0.000	0.117	0.117
13:06:00	0.000	0.000	0.000	0.000	0.117	0.117
13:12:00	0.000	0.000	0.000	0.000	0.116	0.116
13:18:00	0.000	0.000	0.000	0.000	0.116	0.116
13:24:00	0.000	0.000	0.000	0.000	0.115	0.115
13:30:00	0.000	0.000	0.000	0.000	0.114	0.114
13:36:00	0.000	0.000	0.000	0.000	0.114	0.114
13:42:00	0.000	0.000	0.000	0.000	0.113	0.113
13:48:00	0.000	0.000	0.000	0.000	0.113	0.113

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.112	0.112
14:00:00	0.000	0.000	0.000	0.000	0.111	0.111
14:06:00	0.000	0.000	0.000	0.000	0.111	0.111
14:12:00	0.000	0.000	0.000	0.000	0.110	0.110
14:18:00	0.000	0.000	0.000	0.000	0.109	0.109
14:24:00	0.000	0.000	0.000	0.000	0.109	0.109
14:30:00	0.000	0.000	0.000	0.000	0.108	0.108
14:36:00	0.000	0.000	0.000	0.000	0.108	0.108
14:42:00	0.000	0.000	0.000	0.000	0.107	0.107
14:48:00	0.000	0.000	0.000	0.000	0.107	0.107
14:54:00	0.000	0.000	0.000	0.000	0.106	0.106
15:00:00	0.000	0.000	0.000	0.000	0.105	0.105
15:06:00	0.000	0.000	0.000	0.000	0.105	0.105
15:12:00	0.000	0.000	0.000	0.000	0.104	0.104
15:18:00	0.000	0.000	0.000	0.000	0.104	0.104
15:24:00	0.000	0.000	0.000	0.000	0.103	0.103
15:30:00	0.000	0.000	0.000	0.000	0.103	0.103
15:36:00	0.000	0.000	0.000	0.000	0.102	0.102
15:42:00	0.000	0.000	0.000	0.000	0.101	0.101
15:48:00	0.000	0.000	0.000	0.000	0.101	0.101
15:54:00	0.000	0.000	0.000	0.000	0.100	0.100
16:00:00	0.000	0.000	0.000	0.000	0.100	0.100
16:06:00	0.000	0.000	0.000	0.000	0.099	0.099
16:12:00	0.000	0.000	0.000	0.000	0.099	0.099
16:18:00	0.000	0.000	0.000	0.000	0.098	0.098
16:24:00	0.000	0.000	0.000	0.000	0.098	0.098
16:30:00	0.000	0.000	0.000	0.000	0.097	0.097
16:36:00	0.000	0.000	0.000	0.000	0.097	0.097
16:42:00	0.000	0.000	0.000	0.000	0.096	0.096
16:48:00	0.000	0.000	0.000	0.000	0.096	0.096
16:54:00	0.000	0.000	0.000	0.000	0.095	0.095
17:00:00	0.000	0.000	0.000	0.000	0.095	0.095
17:06:00	0.000	0.000	0.000	0.000	0.094	0.094
17:12:00	0.000	0.000	0.000	0.000	0.094	0.094
17:18:00	0.000	0.000	0.000	0.000	0.093	0.093

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.093	0.093
17:30:00	0.000	0.000	0.000	0.000	0.092	0.092
17:36:00	0.000	0.000	0.000	0.000	0.092	0.092
17:42:00	0.000	0.000	0.000	0.000	0.091	0.091
17:48:00	0.000	0.000	0.000	0.000	0.091	0.091
17:54:00	0.000	0.000	0.000	0.000	0.090	0.090
18:00:00	0.000	0.000	0.000	0.000	0.090	0.090
18:06:00	0.000	0.000	0.000	0.000	0.089	0.089
18:12:00	0.000	0.000	0.000	0.000	0.089	0.089
18:18:00	0.000	0.000	0.000	0.000	0.088	0.088
18:24:00	0.000	0.000	0.000	0.000	0.088	0.088
18:30:00	0.000	0.000	0.000	0.000	0.087	0.087
18:36:00	0.000	0.000	0.000	0.000	0.087	0.087
18:42:00	0.000	0.000	0.000	0.000	0.086	0.086
18:48:00	0.000	0.000	0.000	0.000	0.086	0.086
18:54:00	0.000	0.000	0.000	0.000	0.085	0.085
19:00:00	0.000	0.000	0.000	0.000	0.085	0.085
19:06:00	0.000	0.000	0.000	0.000	0.084	0.084
19:12:00	0.000	0.000	0.000	0.000	0.084	0.084
19:18:00	0.000	0.000	0.000	0.000	0.084	0.084
19:24:00	0.000	0.000	0.000	0.000	0.083	0.083
19:30:00	0.000	0.000	0.000	0.000	0.083	0.083
19:36:00	0.000	0.000	0.000	0.000	0.082	0.082
19:42:00	0.000	0.000	0.000	0.000	0.082	0.082
19:48:00	0.000	0.000	0.000	0.000	0.081	0.081
19:54:00	0.000	0.000	0.000	0.000	0.081	0.081
20:00:00	0.000	0.000	0.000	0.000	0.080	0.080
20:06:00	0.000	0.000	0.000	0.000	0.080	0.080
20:12:00	0.000	0.000	0.000	0.000	0.080	0.080
20:18:00	0.000	0.000	0.000	0.000	0.079	0.079
20:24:00	0.000	0.000	0.000	0.000	0.079	0.079
20:30:00	0.000	0.000	0.000	0.000	0.078	0.078
20:36:00	0.000	0.000	0.000	0.000	0.078	0.078
20:42:00	0.000	0.000	0.000	0.000	0.077	0.077
20:48:00	0.000	0.000	0.000	0.000	0.077	0.077

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.077	0.077
21:00:00	0.000	0.000	0.000	0.000	0.076	0.076
21:06:00	0.000	0.000	0.000	0.000	0.076	0.076
21:12:00	0.000	0.000	0.000	0.000	0.075	0.075
21:18:00	0.000	0.000	0.000	0.000	0.075	0.075
21:24:00	0.000	0.000	0.000	0.000	0.075	0.075
21:30:00	0.000	0.000	0.000	0.000	0.074	0.074
21:36:00	0.000	0.000	0.000	0.000	0.074	0.074
21:42:00	0.000	0.000	0.000	0.000	0.073	0.073
21:48:00	0.000	0.000	0.000	0.000	0.073	0.073
21:54:00	0.000	0.000	0.000	0.000	0.073	0.073
22:00:00	0.000	0.000	0.000	0.000	0.072	0.072
22:06:00	0.000	0.000	0.000	0.000	0.072	0.072
22:12:00	0.000	0.000	0.000	0.000	0.071	0.071
22:18:00	0.000	0.000	0.000	0.000	0.071	0.071
22:24:00	0.000	0.000	0.000	0.000	0.071	0.071
22:30:00	0.000	0.000	0.000	0.000	0.070	0.070
22:36:00	0.000	0.000	0.000	0.000	0.070	0.070
22:42:00	0.000	0.000	0.000	0.000	0.069	0.069
22:48:00	0.000	0.000	0.000	0.000	0.069	0.069
22:54:00	0.000	0.000	0.000	0.000	0.069	0.069
23:00:00	0.000	0.000	0.000	0.000	0.068	0.068
23:06:00	0.000	0.000	0.000	0.000	0.068	0.068
23:12:00	0.000	0.000	0.000	0.000	0.068	0.068
23:18:00	0.000	0.000	0.000	0.000	0.067	0.067
23:24:00	0.000	0.000	0.000	0.000	0.067	0.067
23:30:00	0.000	0.000	0.000	0.000	0.067	0.067
23:36:00	0.000	0.000	0.000	0.000	0.066	0.066
23:42:00	0.000	0.000	0.000	0.000	0.066	0.066
23:48:00	0.000	0.000	0.000	0.000	0.065	0.065
23:54:00	0.000	0.000	0.000	0.000	0.065	0.065
24:00:00	0.000	0.000	0.000	0.000	0.065	0.065
24:06:00	0.000	0.000	0.000	0.000	0.064	0.064
24:12:00	0.000	0.000	0.000	0.000	0.064	0.064
24:18:00	0.000	0.000	0.000	0.000	0.064	0.064

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.063	0.063
24:30:00	0.000	0.000	0.000	0.000	0.063	0.063
24:36:00	0.000	0.000	0.000	0.000	0.063	0.063
24:42:00	0.000	0.000	0.000	0.000	0.062	0.062
24:48:00	0.000	0.000	0.000	0.000	0.062	0.062
24:54:00	0.000	0.000	0.000	0.000	0.062	0.062
25:00:00	0.000	0.000	0.000	0.000	0.061	0.061
25:06:00	0.000	0.000	0.000	0.000	0.061	0.061
25:12:00	0.000	0.000	0.000	0.000	0.061	0.061
25:18:00	0.000	0.000	0.000	0.000	0.060	0.060
25:24:00	0.000	0.000	0.000	0.000	0.060	0.060
25:30:00	0.000	0.000	0.000	0.000	0.060	0.060
25:36:00	0.000	0.000	0.000	0.000	0.059	0.059
25:42:00	0.000	0.000	0.000	0.000	0.059	0.059
25:48:00	0.000	0.000	0.000	0.000	0.059	0.059
25:54:00	0.000	0.000	0.000	0.000	0.058	0.058
26:00:00	0.000	0.000	0.000	0.000	0.058	0.058
26:06:00	0.000	0.000	0.000	0.000	0.058	0.058
26:12:00	0.000	0.000	0.000	0.000	0.057	0.057
26:18:00	0.000	0.000	0.000	0.000	0.057	0.057
26:24:00	0.000	0.000	0.000	0.000	0.057	0.057
26:30:00	0.000	0.000	0.000	0.000	0.057	0.057
26:36:00	0.000	0.000	0.000	0.000	0.056	0.056
26:42:00	0.000	0.000	0.000	0.000	0.056	0.056
26:48:00	0.000	0.000	0.000	0.000	0.056	0.056
26:54:00	0.000	0.000	0.000	0.000	0.055	0.055
27:00:00	0.000	0.000	0.000	0.000	0.055	0.055
27:06:00	0.000	0.000	0.000	0.000	0.055	0.055
27:12:00	0.000	0.000	0.000	0.000	0.054	0.054
27:18:00	0.000	0.000	0.000	0.000	0.054	0.054
27:24:00	0.000	0.000	0.000	0.000	0.054	0.054
27:30:00	0.000	0.000	0.000	0.000	0.054	0.054
27:36:00	0.000	0.000	0.000	0.000	0.053	0.053
27:42:00	0.000	0.000	0.000	0.000	0.053	0.053
27:48:00	0.000	0.000	0.000	0.000	0.053	0.053

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.052	0.052
28:00:00	0.000	0.000	0.000	0.000	0.052	0.052
28:06:00	0.000	0.000	0.000	0.000	0.052	0.052
28:12:00	0.000	0.000	0.000	0.000	0.052	0.052
28:18:00	0.000	0.000	0.000	0.000	0.051	0.051
28:24:00	0.000	0.000	0.000	0.000	0.051	0.051
28:30:00	0.000	0.000	0.000	0.000	0.051	0.051
28:36:00	0.000	0.000	0.000	0.000	0.050	0.050
28:42:00	0.000	0.000	0.000	0.000	0.050	0.050
28:48:00	0.000	0.000	0.000	0.000	0.050	0.050

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.58 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB2 Nant Gyrawd Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB2 Nant Gyrawd
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB2 Nant Gyrawd*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	151.3914
2	174.0302
5	246.2555
10	295.9111
30	373.7533
50	410.8534
75	441.2083
100	463.2814
100 + 40% CC	681.6659
200	518.3999
1000	670.3932

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 11.71ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:28:44 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 4DF7-0C72

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.12 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	5.08
Total Rainfall (mm):	61.94	Total flow (ML):	7.25
Peak Rainfall (mm):	6.48	Peak flow (m ³ /s):	0.68

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.513	0.000	0.288	0.000	0.010	0.010
00:06:00	0.644	0.000	0.364	0.000	0.010	0.010
00:12:00	0.809	0.000	0.459	0.001	0.010	0.011
00:18:00	1.014	0.000	0.580	0.003	0.010	0.013
00:24:00	1.271	0.000	0.733	0.006	0.010	0.016
00:30:00	1.591	0.000	0.928	0.010	0.010	0.020
00:36:00	1.988	0.000	1.176	0.017	0.010	0.026
00:42:00	2.480	0.000	1.492	0.025	0.010	0.035
00:48:00	3.088	0.000	1.896	0.036	0.010	0.046
00:54:00	3.831	0.000	2.413	0.051	0.010	0.061
01:00:00	4.729	0.000	3.069	0.070	0.010	0.080
01:06:00	5.771	0.000	3.882	0.095	0.010	0.105
01:12:00	6.479	0.000	4.537	0.126	0.010	0.136
01:18:00	5.771	0.000	4.200	0.164	0.010	0.174
01:24:00	4.729	0.000	3.554	0.210	0.011	0.221
01:30:00	3.831	0.000	2.953	0.262	0.011	0.273
01:36:00	3.088	0.000	2.428	0.318	0.012	0.330
01:42:00	2.480	0.000	1.981	0.376	0.013	0.388
01:48:00	1.988	0.000	1.608	0.434	0.014	0.448
01:54:00	1.591	0.000	1.300	0.491	0.015	0.505
02:00:00	1.271	0.000	1.047	0.543	0.016	0.558
02:06:00	1.014	0.000	0.840	0.588	0.017	0.605
02:12:00	0.809	0.000	0.673	0.625	0.018	0.643
02:18:00	0.644	0.000	0.539	0.649	0.020	0.668
02:24:00	0.513	0.000	0.430	0.660	0.021	0.681
02:30:00	0.000	0.000	0.000	0.659	0.022	0.682
02:36:00	0.000	0.000	0.000	0.649	0.024	0.673
02:42:00	0.000	0.000	0.000	0.630	0.025	0.655
02:48:00	0.000	0.000	0.000	0.605	0.026	0.632
02:54:00	0.000	0.000	0.000	0.575	0.028	0.603
03:00:00	0.000	0.000	0.000	0.542	0.029	0.571
03:06:00	0.000	0.000	0.000	0.506	0.030	0.536
03:12:00	0.000	0.000	0.000	0.470	0.031	0.501
03:18:00	0.000	0.000	0.000	0.434	0.032	0.466

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.399	0.032	0.432
03:30:00	0.000	0.000	0.000	0.366	0.033	0.399
03:36:00	0.000	0.000	0.000	0.333	0.034	0.367
03:42:00	0.000	0.000	0.000	0.303	0.034	0.337
03:48:00	0.000	0.000	0.000	0.274	0.035	0.309
03:54:00	0.000	0.000	0.000	0.247	0.035	0.282
04:00:00	0.000	0.000	0.000	0.221	0.036	0.257
04:06:00	0.000	0.000	0.000	0.196	0.036	0.232
04:12:00	0.000	0.000	0.000	0.173	0.036	0.209
04:18:00	0.000	0.000	0.000	0.150	0.036	0.186
04:24:00	0.000	0.000	0.000	0.129	0.036	0.165
04:30:00	0.000	0.000	0.000	0.109	0.037	0.145
04:36:00	0.000	0.000	0.000	0.090	0.037	0.126
04:42:00	0.000	0.000	0.000	0.073	0.037	0.109
04:48:00	0.000	0.000	0.000	0.057	0.037	0.094
04:54:00	0.000	0.000	0.000	0.044	0.036	0.081
05:00:00	0.000	0.000	0.000	0.034	0.036	0.070
05:06:00	0.000	0.000	0.000	0.025	0.036	0.061
05:12:00	0.000	0.000	0.000	0.019	0.036	0.055
05:18:00	0.000	0.000	0.000	0.013	0.036	0.049
05:24:00	0.000	0.000	0.000	0.009	0.036	0.045
05:30:00	0.000	0.000	0.000	0.006	0.036	0.042
05:36:00	0.000	0.000	0.000	0.004	0.035	0.039
05:42:00	0.000	0.000	0.000	0.002	0.035	0.037
05:48:00	0.000	0.000	0.000	0.001	0.035	0.036
05:54:00	0.000	0.000	0.000	0.000	0.035	0.035
06:00:00	0.000	0.000	0.000	0.000	0.035	0.035
06:06:00	0.000	0.000	0.000	0.000	0.034	0.034
06:12:00	0.000	0.000	0.000	0.000	0.034	0.034
06:18:00	0.000	0.000	0.000	0.000	0.034	0.034
06:24:00	0.000	0.000	0.000	0.000	0.034	0.034
06:30:00	0.000	0.000	0.000	0.000	0.034	0.034
06:36:00	0.000	0.000	0.000	0.000	0.034	0.034
06:42:00	0.000	0.000	0.000	0.000	0.033	0.033
06:48:00	0.000	0.000	0.000	0.000	0.033	0.033

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.033	0.033
07:00:00	0.000	0.000	0.000	0.000	0.033	0.033
07:06:00	0.000	0.000	0.000	0.000	0.033	0.033
07:12:00	0.000	0.000	0.000	0.000	0.032	0.032
07:18:00	0.000	0.000	0.000	0.000	0.032	0.032
07:24:00	0.000	0.000	0.000	0.000	0.032	0.032
07:30:00	0.000	0.000	0.000	0.000	0.032	0.032
07:36:00	0.000	0.000	0.000	0.000	0.032	0.032
07:42:00	0.000	0.000	0.000	0.000	0.032	0.032
07:48:00	0.000	0.000	0.000	0.000	0.031	0.031
07:54:00	0.000	0.000	0.000	0.000	0.031	0.031
08:00:00	0.000	0.000	0.000	0.000	0.031	0.031
08:06:00	0.000	0.000	0.000	0.000	0.031	0.031
08:12:00	0.000	0.000	0.000	0.000	0.031	0.031
08:18:00	0.000	0.000	0.000	0.000	0.031	0.031
08:24:00	0.000	0.000	0.000	0.000	0.030	0.030
08:30:00	0.000	0.000	0.000	0.000	0.030	0.030
08:36:00	0.000	0.000	0.000	0.000	0.030	0.030
08:42:00	0.000	0.000	0.000	0.000	0.030	0.030
08:48:00	0.000	0.000	0.000	0.000	0.030	0.030
08:54:00	0.000	0.000	0.000	0.000	0.030	0.030
09:00:00	0.000	0.000	0.000	0.000	0.029	0.029
09:06:00	0.000	0.000	0.000	0.000	0.029	0.029
09:12:00	0.000	0.000	0.000	0.000	0.029	0.029
09:18:00	0.000	0.000	0.000	0.000	0.029	0.029
09:24:00	0.000	0.000	0.000	0.000	0.029	0.029
09:30:00	0.000	0.000	0.000	0.000	0.029	0.029
09:36:00	0.000	0.000	0.000	0.000	0.028	0.028
09:42:00	0.000	0.000	0.000	0.000	0.028	0.028
09:48:00	0.000	0.000	0.000	0.000	0.028	0.028
09:54:00	0.000	0.000	0.000	0.000	0.028	0.028
10:00:00	0.000	0.000	0.000	0.000	0.028	0.028
10:06:00	0.000	0.000	0.000	0.000	0.028	0.028
10:12:00	0.000	0.000	0.000	0.000	0.028	0.028
10:18:00	0.000	0.000	0.000	0.000	0.027	0.027

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.027	0.027
10:30:00	0.000	0.000	0.000	0.000	0.027	0.027
10:36:00	0.000	0.000	0.000	0.000	0.027	0.027
10:42:00	0.000	0.000	0.000	0.000	0.027	0.027
10:48:00	0.000	0.000	0.000	0.000	0.027	0.027
10:54:00	0.000	0.000	0.000	0.000	0.027	0.027
11:00:00	0.000	0.000	0.000	0.000	0.026	0.026
11:06:00	0.000	0.000	0.000	0.000	0.026	0.026
11:12:00	0.000	0.000	0.000	0.000	0.026	0.026
11:18:00	0.000	0.000	0.000	0.000	0.026	0.026
11:24:00	0.000	0.000	0.000	0.000	0.026	0.026
11:30:00	0.000	0.000	0.000	0.000	0.026	0.026
11:36:00	0.000	0.000	0.000	0.000	0.026	0.026
11:42:00	0.000	0.000	0.000	0.000	0.025	0.025
11:48:00	0.000	0.000	0.000	0.000	0.025	0.025
11:54:00	0.000	0.000	0.000	0.000	0.025	0.025
12:00:00	0.000	0.000	0.000	0.000	0.025	0.025
12:06:00	0.000	0.000	0.000	0.000	0.025	0.025
12:12:00	0.000	0.000	0.000	0.000	0.025	0.025
12:18:00	0.000	0.000	0.000	0.000	0.025	0.025
12:24:00	0.000	0.000	0.000	0.000	0.024	0.024
12:30:00	0.000	0.000	0.000	0.000	0.024	0.024
12:36:00	0.000	0.000	0.000	0.000	0.024	0.024
12:42:00	0.000	0.000	0.000	0.000	0.024	0.024
12:48:00	0.000	0.000	0.000	0.000	0.024	0.024
12:54:00	0.000	0.000	0.000	0.000	0.024	0.024
13:00:00	0.000	0.000	0.000	0.000	0.024	0.024
13:06:00	0.000	0.000	0.000	0.000	0.024	0.024
13:12:00	0.000	0.000	0.000	0.000	0.023	0.023
13:18:00	0.000	0.000	0.000	0.000	0.023	0.023
13:24:00	0.000	0.000	0.000	0.000	0.023	0.023
13:30:00	0.000	0.000	0.000	0.000	0.023	0.023
13:36:00	0.000	0.000	0.000	0.000	0.023	0.023
13:42:00	0.000	0.000	0.000	0.000	0.023	0.023
13:48:00	0.000	0.000	0.000	0.000	0.023	0.023

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.023	0.023
14:00:00	0.000	0.000	0.000	0.000	0.022	0.022
14:06:00	0.000	0.000	0.000	0.000	0.022	0.022
14:12:00	0.000	0.000	0.000	0.000	0.022	0.022
14:18:00	0.000	0.000	0.000	0.000	0.022	0.022
14:24:00	0.000	0.000	0.000	0.000	0.022	0.022
14:30:00	0.000	0.000	0.000	0.000	0.022	0.022
14:36:00	0.000	0.000	0.000	0.000	0.022	0.022
14:42:00	0.000	0.000	0.000	0.000	0.022	0.022
14:48:00	0.000	0.000	0.000	0.000	0.021	0.021
14:54:00	0.000	0.000	0.000	0.000	0.021	0.021
15:00:00	0.000	0.000	0.000	0.000	0.021	0.021
15:06:00	0.000	0.000	0.000	0.000	0.021	0.021
15:12:00	0.000	0.000	0.000	0.000	0.021	0.021
15:18:00	0.000	0.000	0.000	0.000	0.021	0.021
15:24:00	0.000	0.000	0.000	0.000	0.021	0.021
15:30:00	0.000	0.000	0.000	0.000	0.021	0.021
15:36:00	0.000	0.000	0.000	0.000	0.021	0.021
15:42:00	0.000	0.000	0.000	0.000	0.020	0.020
15:48:00	0.000	0.000	0.000	0.000	0.020	0.020
15:54:00	0.000	0.000	0.000	0.000	0.020	0.020
16:00:00	0.000	0.000	0.000	0.000	0.020	0.020
16:06:00	0.000	0.000	0.000	0.000	0.020	0.020
16:12:00	0.000	0.000	0.000	0.000	0.020	0.020
16:18:00	0.000	0.000	0.000	0.000	0.020	0.020
16:24:00	0.000	0.000	0.000	0.000	0.020	0.020
16:30:00	0.000	0.000	0.000	0.000	0.020	0.020
16:36:00	0.000	0.000	0.000	0.000	0.020	0.020
16:42:00	0.000	0.000	0.000	0.000	0.019	0.019
16:48:00	0.000	0.000	0.000	0.000	0.019	0.019
16:54:00	0.000	0.000	0.000	0.000	0.019	0.019
17:00:00	0.000	0.000	0.000	0.000	0.019	0.019
17:06:00	0.000	0.000	0.000	0.000	0.019	0.019
17:12:00	0.000	0.000	0.000	0.000	0.019	0.019
17:18:00	0.000	0.000	0.000	0.000	0.019	0.019

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.019	0.019
17:30:00	0.000	0.000	0.000	0.000	0.019	0.019
17:36:00	0.000	0.000	0.000	0.000	0.018	0.018
17:42:00	0.000	0.000	0.000	0.000	0.018	0.018
17:48:00	0.000	0.000	0.000	0.000	0.018	0.018
17:54:00	0.000	0.000	0.000	0.000	0.018	0.018
18:00:00	0.000	0.000	0.000	0.000	0.018	0.018
18:06:00	0.000	0.000	0.000	0.000	0.018	0.018
18:12:00	0.000	0.000	0.000	0.000	0.018	0.018
18:18:00	0.000	0.000	0.000	0.000	0.018	0.018
18:24:00	0.000	0.000	0.000	0.000	0.018	0.018
18:30:00	0.000	0.000	0.000	0.000	0.018	0.018
18:36:00	0.000	0.000	0.000	0.000	0.017	0.017
18:42:00	0.000	0.000	0.000	0.000	0.017	0.017
18:48:00	0.000	0.000	0.000	0.000	0.017	0.017
18:54:00	0.000	0.000	0.000	0.000	0.017	0.017
19:00:00	0.000	0.000	0.000	0.000	0.017	0.017
19:06:00	0.000	0.000	0.000	0.000	0.017	0.017
19:12:00	0.000	0.000	0.000	0.000	0.017	0.017
19:18:00	0.000	0.000	0.000	0.000	0.017	0.017
19:24:00	0.000	0.000	0.000	0.000	0.017	0.017
19:30:00	0.000	0.000	0.000	0.000	0.017	0.017
19:36:00	0.000	0.000	0.000	0.000	0.017	0.017
19:42:00	0.000	0.000	0.000	0.000	0.016	0.016
19:48:00	0.000	0.000	0.000	0.000	0.016	0.016
19:54:00	0.000	0.000	0.000	0.000	0.016	0.016
20:00:00	0.000	0.000	0.000	0.000	0.016	0.016
20:06:00	0.000	0.000	0.000	0.000	0.016	0.016
20:12:00	0.000	0.000	0.000	0.000	0.016	0.016
20:18:00	0.000	0.000	0.000	0.000	0.016	0.016
20:24:00	0.000	0.000	0.000	0.000	0.016	0.016
20:30:00	0.000	0.000	0.000	0.000	0.016	0.016
20:36:00	0.000	0.000	0.000	0.000	0.016	0.016
20:42:00	0.000	0.000	0.000	0.000	0.016	0.016
20:48:00	0.000	0.000	0.000	0.000	0.016	0.016

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.015	0.015
21:00:00	0.000	0.000	0.000	0.000	0.015	0.015
21:06:00	0.000	0.000	0.000	0.000	0.015	0.015
21:12:00	0.000	0.000	0.000	0.000	0.015	0.015
21:18:00	0.000	0.000	0.000	0.000	0.015	0.015
21:24:00	0.000	0.000	0.000	0.000	0.015	0.015
21:30:00	0.000	0.000	0.000	0.000	0.015	0.015
21:36:00	0.000	0.000	0.000	0.000	0.015	0.015
21:42:00	0.000	0.000	0.000	0.000	0.015	0.015
21:48:00	0.000	0.000	0.000	0.000	0.015	0.015
21:54:00	0.000	0.000	0.000	0.000	0.015	0.015
22:00:00	0.000	0.000	0.000	0.000	0.015	0.015
22:06:00	0.000	0.000	0.000	0.000	0.014	0.014
22:12:00	0.000	0.000	0.000	0.000	0.014	0.014
22:18:00	0.000	0.000	0.000	0.000	0.014	0.014
22:24:00	0.000	0.000	0.000	0.000	0.014	0.014
22:30:00	0.000	0.000	0.000	0.000	0.014	0.014
22:36:00	0.000	0.000	0.000	0.000	0.014	0.014
22:42:00	0.000	0.000	0.000	0.000	0.014	0.014
22:48:00	0.000	0.000	0.000	0.000	0.014	0.014
22:54:00	0.000	0.000	0.000	0.000	0.014	0.014
23:00:00	0.000	0.000	0.000	0.000	0.014	0.014
23:06:00	0.000	0.000	0.000	0.000	0.014	0.014
23:12:00	0.000	0.000	0.000	0.000	0.014	0.014
23:18:00	0.000	0.000	0.000	0.000	0.014	0.014
23:24:00	0.000	0.000	0.000	0.000	0.013	0.013
23:30:00	0.000	0.000	0.000	0.000	0.013	0.013
23:36:00	0.000	0.000	0.000	0.000	0.013	0.013
23:42:00	0.000	0.000	0.000	0.000	0.013	0.013
23:48:00	0.000	0.000	0.000	0.000	0.013	0.013
23:54:00	0.000	0.000	0.000	0.000	0.013	0.013
24:00:00	0.000	0.000	0.000	0.000	0.013	0.013
24:06:00	0.000	0.000	0.000	0.000	0.013	0.013
24:12:00	0.000	0.000	0.000	0.000	0.013	0.013
24:18:00	0.000	0.000	0.000	0.000	0.013	0.013

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.013	0.013
24:30:00	0.000	0.000	0.000	0.000	0.013	0.013
24:36:00	0.000	0.000	0.000	0.000	0.013	0.013
24:42:00	0.000	0.000	0.000	0.000	0.013	0.013
24:48:00	0.000	0.000	0.000	0.000	0.013	0.013
24:54:00	0.000	0.000	0.000	0.000	0.012	0.012
25:00:00	0.000	0.000	0.000	0.000	0.012	0.012
25:06:00	0.000	0.000	0.000	0.000	0.012	0.012
25:12:00	0.000	0.000	0.000	0.000	0.012	0.012
25:18:00	0.000	0.000	0.000	0.000	0.012	0.012
25:24:00	0.000	0.000	0.000	0.000	0.012	0.012
25:30:00	0.000	0.000	0.000	0.000	0.012	0.012
25:36:00	0.000	0.000	0.000	0.000	0.012	0.012
25:42:00	0.000	0.000	0.000	0.000	0.012	0.012
25:48:00	0.000	0.000	0.000	0.000	0.012	0.012
25:54:00	0.000	0.000	0.000	0.000	0.012	0.012
26:00:00	0.000	0.000	0.000	0.000	0.012	0.012
26:06:00	0.000	0.000	0.000	0.000	0.012	0.012
26:12:00	0.000	0.000	0.000	0.000	0.012	0.012
26:18:00	0.000	0.000	0.000	0.000	0.012	0.012
26:24:00	0.000	0.000	0.000	0.000	0.011	0.011
26:30:00	0.000	0.000	0.000	0.000	0.011	0.011
26:36:00	0.000	0.000	0.000	0.000	0.011	0.011
26:42:00	0.000	0.000	0.000	0.000	0.011	0.011
26:48:00	0.000	0.000	0.000	0.000	0.011	0.011
26:54:00	0.000	0.000	0.000	0.000	0.011	0.011
27:00:00	0.000	0.000	0.000	0.000	0.011	0.011
27:06:00	0.000	0.000	0.000	0.000	0.011	0.011
27:12:00	0.000	0.000	0.000	0.000	0.011	0.011
27:18:00	0.000	0.000	0.000	0.000	0.011	0.011
27:24:00	0.000	0.000	0.000	0.000	0.011	0.011
27:30:00	0.000	0.000	0.000	0.000	0.011	0.011
27:36:00	0.000	0.000	0.000	0.000	0.011	0.011
27:42:00	0.000	0.000	0.000	0.000	0.011	0.011
27:48:00	0.000	0.000	0.000	0.000	0.011	0.011

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.011	0.011
28:00:00	0.000	0.000	0.000	0.000	0.011	0.011
28:06:00	0.000	0.000	0.000	0.000	0.010	0.010
28:12:00	0.000	0.000	0.000	0.000	0.010	0.010
28:18:00	0.000	0.000	0.000	0.000	0.010	0.010
28:24:00	0.000	0.000	0.000	0.000	0.010	0.010
28:30:00	0.000	0.000	0.000	0.000	0.010	0.010
28:36:00	0.000	0.000	0.000	0.000	0.010	0.010
28:42:00	0.000	0.000	0.000	0.000	0.010	0.010
28:48:00	0.000	0.000	0.000	0.000	0.010	0.010

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.12 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Nant Cwmlacs Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – Nant Cwmlacs
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – Nant Cwmlacs*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	307.0487
2	352.944
5	499.3504
10	599.9942
30	757.75
50	832.9303
75	894.4393
100	939.1648
100 + 40% CC	1381.57
200	1050.824
1000	1358.735

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 23.84ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:31:30 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 5C50-CC56

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.24 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	10.29
Total Rainfall (mm):	61.70	Total flow (ML):	14.71
Peak Rainfall (mm):	6.45	Peak flow (m ³ /s):	1.38

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.02	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
00:00:00	0.511	0.000	0.287	0.000	0.020	0.020
00:06:00	0.642	0.000	0.362	0.001	0.020	0.021
00:12:00	0.806	0.000	0.457	0.003	0.020	0.023
00:18:00	1.011	0.000	0.578	0.006	0.020	0.026
00:24:00	1.266	0.000	0.731	0.012	0.020	0.032
00:30:00	1.585	0.000	0.925	0.021	0.020	0.041
00:36:00	1.981	0.000	1.171	0.034	0.020	0.053
00:42:00	2.471	0.000	1.486	0.051	0.020	0.070
00:48:00	3.076	0.000	1.888	0.073	0.020	0.093
00:54:00	3.817	0.000	2.402	0.103	0.020	0.123
01:00:00	4.711	0.000	3.056	0.142	0.020	0.162
01:06:00	5.749	0.000	3.865	0.192	0.020	0.212
01:12:00	6.454	0.000	4.516	0.255	0.021	0.275
01:18:00	5.749	0.000	4.180	0.332	0.021	0.354
01:24:00	4.711	0.000	3.537	0.425	0.022	0.447
01:30:00	3.817	0.000	2.938	0.531	0.023	0.554
01:36:00	3.076	0.000	2.416	0.644	0.024	0.668
01:42:00	2.471	0.000	1.972	0.762	0.026	0.788
01:48:00	1.981	0.000	1.600	0.880	0.028	0.907
01:54:00	1.585	0.000	1.293	0.994	0.030	1.024
02:00:00	1.266	0.000	1.041	1.100	0.032	1.132
02:06:00	1.011	0.000	0.836	1.193	0.034	1.227
02:12:00	0.806	0.000	0.670	1.266	0.037	1.303
02:18:00	0.642	0.000	0.536	1.315	0.040	1.355
02:24:00	0.511	0.000	0.428	1.337	0.043	1.380
02:30:00	0.000	0.000	0.000	1.336	0.046	1.382
02:36:00	0.000	0.000	0.000	1.315	0.048	1.363
02:42:00	0.000	0.000	0.000	1.277	0.051	1.328
02:48:00	0.000	0.000	0.000	1.226	0.054	1.280
02:54:00	0.000	0.000	0.000	1.165	0.056	1.222
03:00:00	0.000	0.000	0.000	1.098	0.059	1.156
03:06:00	0.000	0.000	0.000	1.026	0.061	1.087
03:12:00	0.000	0.000	0.000	0.953	0.063	1.015
03:18:00	0.000	0.000	0.000	0.880	0.064	0.944

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.809	0.066	0.875
03:30:00	0.000	0.000	0.000	0.741	0.068	0.808
03:36:00	0.000	0.000	0.000	0.675	0.069	0.744
03:42:00	0.000	0.000	0.000	0.614	0.070	0.684
03:48:00	0.000	0.000	0.000	0.556	0.071	0.627
03:54:00	0.000	0.000	0.000	0.500	0.072	0.572
04:00:00	0.000	0.000	0.000	0.448	0.072	0.520
04:06:00	0.000	0.000	0.000	0.398	0.073	0.471
04:12:00	0.000	0.000	0.000	0.350	0.073	0.423
04:18:00	0.000	0.000	0.000	0.304	0.074	0.378
04:24:00	0.000	0.000	0.000	0.261	0.074	0.335
04:30:00	0.000	0.000	0.000	0.220	0.074	0.294
04:36:00	0.000	0.000	0.000	0.182	0.074	0.256
04:42:00	0.000	0.000	0.000	0.147	0.074	0.221
04:48:00	0.000	0.000	0.000	0.116	0.074	0.190
04:54:00	0.000	0.000	0.000	0.090	0.074	0.164
05:00:00	0.000	0.000	0.000	0.068	0.074	0.142
05:06:00	0.000	0.000	0.000	0.051	0.074	0.125
05:12:00	0.000	0.000	0.000	0.038	0.073	0.111
05:18:00	0.000	0.000	0.000	0.027	0.073	0.100
05:24:00	0.000	0.000	0.000	0.019	0.073	0.091
05:30:00	0.000	0.000	0.000	0.013	0.072	0.085
05:36:00	0.000	0.000	0.000	0.008	0.072	0.080
05:42:00	0.000	0.000	0.000	0.005	0.072	0.076
05:48:00	0.000	0.000	0.000	0.002	0.071	0.074
05:54:00	0.000	0.000	0.000	0.001	0.071	0.072
06:00:00	0.000	0.000	0.000	0.000	0.070	0.071
06:06:00	0.000	0.000	0.000	0.000	0.070	0.070
06:12:00	0.000	0.000	0.000	0.000	0.070	0.070
06:18:00	0.000	0.000	0.000	0.000	0.069	0.069
06:24:00	0.000	0.000	0.000	0.000	0.069	0.069
06:30:00	0.000	0.000	0.000	0.000	0.069	0.069
06:36:00	0.000	0.000	0.000	0.000	0.068	0.068
06:42:00	0.000	0.000	0.000	0.000	0.068	0.068
06:48:00	0.000	0.000	0.000	0.000	0.067	0.067

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.067	0.067
07:00:00	0.000	0.000	0.000	0.000	0.067	0.067
07:06:00	0.000	0.000	0.000	0.000	0.066	0.066
07:12:00	0.000	0.000	0.000	0.000	0.066	0.066
07:18:00	0.000	0.000	0.000	0.000	0.066	0.066
07:24:00	0.000	0.000	0.000	0.000	0.065	0.065
07:30:00	0.000	0.000	0.000	0.000	0.065	0.065
07:36:00	0.000	0.000	0.000	0.000	0.065	0.065
07:42:00	0.000	0.000	0.000	0.000	0.064	0.064
07:48:00	0.000	0.000	0.000	0.000	0.064	0.064
07:54:00	0.000	0.000	0.000	0.000	0.064	0.064
08:00:00	0.000	0.000	0.000	0.000	0.063	0.063
08:06:00	0.000	0.000	0.000	0.000	0.063	0.063
08:12:00	0.000	0.000	0.000	0.000	0.062	0.062
08:18:00	0.000	0.000	0.000	0.000	0.062	0.062
08:24:00	0.000	0.000	0.000	0.000	0.062	0.062
08:30:00	0.000	0.000	0.000	0.000	0.061	0.061
08:36:00	0.000	0.000	0.000	0.000	0.061	0.061
08:42:00	0.000	0.000	0.000	0.000	0.061	0.061
08:48:00	0.000	0.000	0.000	0.000	0.060	0.060
08:54:00	0.000	0.000	0.000	0.000	0.060	0.060
09:00:00	0.000	0.000	0.000	0.000	0.060	0.060
09:06:00	0.000	0.000	0.000	0.000	0.060	0.060
09:12:00	0.000	0.000	0.000	0.000	0.059	0.059
09:18:00	0.000	0.000	0.000	0.000	0.059	0.059
09:24:00	0.000	0.000	0.000	0.000	0.059	0.059
09:30:00	0.000	0.000	0.000	0.000	0.058	0.058
09:36:00	0.000	0.000	0.000	0.000	0.058	0.058
09:42:00	0.000	0.000	0.000	0.000	0.058	0.058
09:48:00	0.000	0.000	0.000	0.000	0.057	0.057
09:54:00	0.000	0.000	0.000	0.000	0.057	0.057
10:00:00	0.000	0.000	0.000	0.000	0.057	0.057
10:06:00	0.000	0.000	0.000	0.000	0.056	0.056
10:12:00	0.000	0.000	0.000	0.000	0.056	0.056
10:18:00	0.000	0.000	0.000	0.000	0.056	0.056

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.055	0.055
10:30:00	0.000	0.000	0.000	0.000	0.055	0.055
10:36:00	0.000	0.000	0.000	0.000	0.055	0.055
10:42:00	0.000	0.000	0.000	0.000	0.055	0.055
10:48:00	0.000	0.000	0.000	0.000	0.054	0.054
10:54:00	0.000	0.000	0.000	0.000	0.054	0.054
11:00:00	0.000	0.000	0.000	0.000	0.054	0.054
11:06:00	0.000	0.000	0.000	0.000	0.053	0.053
11:12:00	0.000	0.000	0.000	0.000	0.053	0.053
11:18:00	0.000	0.000	0.000	0.000	0.053	0.053
11:24:00	0.000	0.000	0.000	0.000	0.053	0.053
11:30:00	0.000	0.000	0.000	0.000	0.052	0.052
11:36:00	0.000	0.000	0.000	0.000	0.052	0.052
11:42:00	0.000	0.000	0.000	0.000	0.052	0.052
11:48:00	0.000	0.000	0.000	0.000	0.051	0.051
11:54:00	0.000	0.000	0.000	0.000	0.051	0.051
12:00:00	0.000	0.000	0.000	0.000	0.051	0.051
12:06:00	0.000	0.000	0.000	0.000	0.051	0.051
12:12:00	0.000	0.000	0.000	0.000	0.050	0.050
12:18:00	0.000	0.000	0.000	0.000	0.050	0.050
12:24:00	0.000	0.000	0.000	0.000	0.050	0.050
12:30:00	0.000	0.000	0.000	0.000	0.049	0.049
12:36:00	0.000	0.000	0.000	0.000	0.049	0.049
12:42:00	0.000	0.000	0.000	0.000	0.049	0.049
12:48:00	0.000	0.000	0.000	0.000	0.049	0.049
12:54:00	0.000	0.000	0.000	0.000	0.048	0.048
13:00:00	0.000	0.000	0.000	0.000	0.048	0.048
13:06:00	0.000	0.000	0.000	0.000	0.048	0.048
13:12:00	0.000	0.000	0.000	0.000	0.048	0.048
13:18:00	0.000	0.000	0.000	0.000	0.047	0.047
13:24:00	0.000	0.000	0.000	0.000	0.047	0.047
13:30:00	0.000	0.000	0.000	0.000	0.047	0.047
13:36:00	0.000	0.000	0.000	0.000	0.047	0.047
13:42:00	0.000	0.000	0.000	0.000	0.046	0.046
13:48:00	0.000	0.000	0.000	0.000	0.046	0.046

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.046	0.046
14:00:00	0.000	0.000	0.000	0.000	0.046	0.046
14:06:00	0.000	0.000	0.000	0.000	0.045	0.045
14:12:00	0.000	0.000	0.000	0.000	0.045	0.045
14:18:00	0.000	0.000	0.000	0.000	0.045	0.045
14:24:00	0.000	0.000	0.000	0.000	0.045	0.045
14:30:00	0.000	0.000	0.000	0.000	0.044	0.044
14:36:00	0.000	0.000	0.000	0.000	0.044	0.044
14:42:00	0.000	0.000	0.000	0.000	0.044	0.044
14:48:00	0.000	0.000	0.000	0.000	0.044	0.044
14:54:00	0.000	0.000	0.000	0.000	0.043	0.043
15:00:00	0.000	0.000	0.000	0.000	0.043	0.043
15:06:00	0.000	0.000	0.000	0.000	0.043	0.043
15:12:00	0.000	0.000	0.000	0.000	0.043	0.043
15:18:00	0.000	0.000	0.000	0.000	0.043	0.043
15:24:00	0.000	0.000	0.000	0.000	0.042	0.042
15:30:00	0.000	0.000	0.000	0.000	0.042	0.042
15:36:00	0.000	0.000	0.000	0.000	0.042	0.042
15:42:00	0.000	0.000	0.000	0.000	0.042	0.042
15:48:00	0.000	0.000	0.000	0.000	0.041	0.041
15:54:00	0.000	0.000	0.000	0.000	0.041	0.041
16:00:00	0.000	0.000	0.000	0.000	0.041	0.041
16:06:00	0.000	0.000	0.000	0.000	0.041	0.041
16:12:00	0.000	0.000	0.000	0.000	0.041	0.041
16:18:00	0.000	0.000	0.000	0.000	0.040	0.040
16:24:00	0.000	0.000	0.000	0.000	0.040	0.040
16:30:00	0.000	0.000	0.000	0.000	0.040	0.040
16:36:00	0.000	0.000	0.000	0.000	0.040	0.040
16:42:00	0.000	0.000	0.000	0.000	0.039	0.039
16:48:00	0.000	0.000	0.000	0.000	0.039	0.039
16:54:00	0.000	0.000	0.000	0.000	0.039	0.039
17:00:00	0.000	0.000	0.000	0.000	0.039	0.039
17:06:00	0.000	0.000	0.000	0.000	0.039	0.039
17:12:00	0.000	0.000	0.000	0.000	0.038	0.038
17:18:00	0.000	0.000	0.000	0.000	0.038	0.038

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.038	0.038
17:30:00	0.000	0.000	0.000	0.000	0.038	0.038
17:36:00	0.000	0.000	0.000	0.000	0.038	0.038
17:42:00	0.000	0.000	0.000	0.000	0.037	0.037
17:48:00	0.000	0.000	0.000	0.000	0.037	0.037
17:54:00	0.000	0.000	0.000	0.000	0.037	0.037
18:00:00	0.000	0.000	0.000	0.000	0.037	0.037
18:06:00	0.000	0.000	0.000	0.000	0.037	0.037
18:12:00	0.000	0.000	0.000	0.000	0.036	0.036
18:18:00	0.000	0.000	0.000	0.000	0.036	0.036
18:24:00	0.000	0.000	0.000	0.000	0.036	0.036
18:30:00	0.000	0.000	0.000	0.000	0.036	0.036
18:36:00	0.000	0.000	0.000	0.000	0.036	0.036
18:42:00	0.000	0.000	0.000	0.000	0.035	0.035
18:48:00	0.000	0.000	0.000	0.000	0.035	0.035
18:54:00	0.000	0.000	0.000	0.000	0.035	0.035
19:00:00	0.000	0.000	0.000	0.000	0.035	0.035
19:06:00	0.000	0.000	0.000	0.000	0.035	0.035
19:12:00	0.000	0.000	0.000	0.000	0.034	0.034
19:18:00	0.000	0.000	0.000	0.000	0.034	0.034
19:24:00	0.000	0.000	0.000	0.000	0.034	0.034
19:30:00	0.000	0.000	0.000	0.000	0.034	0.034
19:36:00	0.000	0.000	0.000	0.000	0.034	0.034
19:42:00	0.000	0.000	0.000	0.000	0.034	0.034
19:48:00	0.000	0.000	0.000	0.000	0.033	0.033
19:54:00	0.000	0.000	0.000	0.000	0.033	0.033
20:00:00	0.000	0.000	0.000	0.000	0.033	0.033
20:06:00	0.000	0.000	0.000	0.000	0.033	0.033
20:12:00	0.000	0.000	0.000	0.000	0.033	0.033
20:18:00	0.000	0.000	0.000	0.000	0.032	0.032
20:24:00	0.000	0.000	0.000	0.000	0.032	0.032
20:30:00	0.000	0.000	0.000	0.000	0.032	0.032
20:36:00	0.000	0.000	0.000	0.000	0.032	0.032
20:42:00	0.000	0.000	0.000	0.000	0.032	0.032
20:48:00	0.000	0.000	0.000	0.000	0.032	0.032

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.031	0.031
21:00:00	0.000	0.000	0.000	0.000	0.031	0.031
21:06:00	0.000	0.000	0.000	0.000	0.031	0.031
21:12:00	0.000	0.000	0.000	0.000	0.031	0.031
21:18:00	0.000	0.000	0.000	0.000	0.031	0.031
21:24:00	0.000	0.000	0.000	0.000	0.031	0.031
21:30:00	0.000	0.000	0.000	0.000	0.030	0.030
21:36:00	0.000	0.000	0.000	0.000	0.030	0.030
21:42:00	0.000	0.000	0.000	0.000	0.030	0.030
21:48:00	0.000	0.000	0.000	0.000	0.030	0.030
21:54:00	0.000	0.000	0.000	0.000	0.030	0.030
22:00:00	0.000	0.000	0.000	0.000	0.030	0.030
22:06:00	0.000	0.000	0.000	0.000	0.029	0.029
22:12:00	0.000	0.000	0.000	0.000	0.029	0.029
22:18:00	0.000	0.000	0.000	0.000	0.029	0.029
22:24:00	0.000	0.000	0.000	0.000	0.029	0.029
22:30:00	0.000	0.000	0.000	0.000	0.029	0.029
22:36:00	0.000	0.000	0.000	0.000	0.029	0.029
22:42:00	0.000	0.000	0.000	0.000	0.028	0.028
22:48:00	0.000	0.000	0.000	0.000	0.028	0.028
22:54:00	0.000	0.000	0.000	0.000	0.028	0.028
23:00:00	0.000	0.000	0.000	0.000	0.028	0.028
23:06:00	0.000	0.000	0.000	0.000	0.028	0.028
23:12:00	0.000	0.000	0.000	0.000	0.028	0.028
23:18:00	0.000	0.000	0.000	0.000	0.028	0.028
23:24:00	0.000	0.000	0.000	0.000	0.027	0.027
23:30:00	0.000	0.000	0.000	0.000	0.027	0.027
23:36:00	0.000	0.000	0.000	0.000	0.027	0.027
23:42:00	0.000	0.000	0.000	0.000	0.027	0.027
23:48:00	0.000	0.000	0.000	0.000	0.027	0.027
23:54:00	0.000	0.000	0.000	0.000	0.027	0.027
24:00:00	0.000	0.000	0.000	0.000	0.027	0.027
24:06:00	0.000	0.000	0.000	0.000	0.026	0.026
24:12:00	0.000	0.000	0.000	0.000	0.026	0.026
24:18:00	0.000	0.000	0.000	0.000	0.026	0.026

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.026	0.026
24:30:00	0.000	0.000	0.000	0.000	0.026	0.026
24:36:00	0.000	0.000	0.000	0.000	0.026	0.026
24:42:00	0.000	0.000	0.000	0.000	0.026	0.026
24:48:00	0.000	0.000	0.000	0.000	0.025	0.025
24:54:00	0.000	0.000	0.000	0.000	0.025	0.025
25:00:00	0.000	0.000	0.000	0.000	0.025	0.025
25:06:00	0.000	0.000	0.000	0.000	0.025	0.025
25:12:00	0.000	0.000	0.000	0.000	0.025	0.025
25:18:00	0.000	0.000	0.000	0.000	0.025	0.025
25:24:00	0.000	0.000	0.000	0.000	0.025	0.025
25:30:00	0.000	0.000	0.000	0.000	0.024	0.024
25:36:00	0.000	0.000	0.000	0.000	0.024	0.024
25:42:00	0.000	0.000	0.000	0.000	0.024	0.024
25:48:00	0.000	0.000	0.000	0.000	0.024	0.024
25:54:00	0.000	0.000	0.000	0.000	0.024	0.024
26:00:00	0.000	0.000	0.000	0.000	0.024	0.024
26:06:00	0.000	0.000	0.000	0.000	0.024	0.024
26:12:00	0.000	0.000	0.000	0.000	0.024	0.024
26:18:00	0.000	0.000	0.000	0.000	0.023	0.023
26:24:00	0.000	0.000	0.000	0.000	0.023	0.023
26:30:00	0.000	0.000	0.000	0.000	0.023	0.023
26:36:00	0.000	0.000	0.000	0.000	0.023	0.023
26:42:00	0.000	0.000	0.000	0.000	0.023	0.023
26:48:00	0.000	0.000	0.000	0.000	0.023	0.023
26:54:00	0.000	0.000	0.000	0.000	0.023	0.023
27:00:00	0.000	0.000	0.000	0.000	0.023	0.023
27:06:00	0.000	0.000	0.000	0.000	0.022	0.022
27:12:00	0.000	0.000	0.000	0.000	0.022	0.022
27:18:00	0.000	0.000	0.000	0.000	0.022	0.022
27:24:00	0.000	0.000	0.000	0.000	0.022	0.022
27:30:00	0.000	0.000	0.000	0.000	0.022	0.022
27:36:00	0.000	0.000	0.000	0.000	0.022	0.022
27:42:00	0.000	0.000	0.000	0.000	0.022	0.022
27:48:00	0.000	0.000	0.000	0.000	0.022	0.022

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.021	0.021
28:00:00	0.000	0.000	0.000	0.000	0.021	0.021
28:06:00	0.000	0.000	0.000	0.000	0.021	0.021
28:12:00	0.000	0.000	0.000	0.000	0.021	0.021
28:18:00	0.000	0.000	0.000	0.000	0.021	0.021
28:24:00	0.000	0.000	0.000	0.000	0.021	0.021
28:30:00	0.000	0.000	0.000	0.000	0.021	0.021
28:36:00	0.000	0.000	0.000	0.000	0.021	0.021
28:42:00	0.000	0.000	0.000	0.000	0.021	0.021
28:48:00	0.000	0.000	0.000	0.000	0.020	0.020

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.24 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB3 Bargoed Taff Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB3 Bargoed Taff
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB3 Bargoed Taff*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	1686.329
2	1937.97
5	2740.402
10	3291.769
30	4155.655
50	4567.208
75	4903.857
100	5148.613
100 + 40% CC	7567.669
200	5759.146
1000	7442.851

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 132.81ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:37:19 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: E6F2-2305

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 1.33 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	56.36
Total Rainfall (mm):	60.82	Total flow (ML):	80.76
Peak Rainfall (mm):	6.36	Peak flow (m ³ /s):	7.57

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.97	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.11	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.504	0.000	0.283	0.000	0.113	0.113
00:06:00	0.633	0.000	0.357	0.003	0.112	0.116
00:12:00	0.794	0.000	0.451	0.014	0.112	0.126
00:18:00	0.996	0.000	0.570	0.035	0.111	0.147
00:24:00	1.248	0.000	0.720	0.068	0.111	0.179
00:30:00	1.562	0.000	0.911	0.117	0.110	0.227
00:36:00	1.952	0.000	1.154	0.185	0.110	0.295
00:42:00	2.436	0.000	1.464	0.277	0.110	0.388
00:48:00	3.032	0.000	1.859	0.402	0.110	0.512
00:54:00	3.762	0.000	2.364	0.566	0.111	0.676
01:00:00	4.644	0.000	3.007	0.780	0.112	0.892
01:06:00	5.667	0.000	3.800	1.054	0.113	1.167
01:12:00	6.362	0.000	4.439	1.397	0.116	1.513
01:18:00	5.667	0.000	4.107	1.823	0.119	1.942
01:24:00	4.644	0.000	3.474	2.333	0.123	2.456
01:30:00	3.762	0.000	2.885	2.909	0.128	3.037
01:36:00	3.032	0.000	2.372	3.530	0.135	3.665
01:42:00	2.436	0.000	1.935	4.175	0.144	4.319
01:48:00	1.952	0.000	1.570	4.822	0.153	4.975
01:54:00	1.562	0.000	1.269	5.448	0.165	5.612
02:00:00	1.248	0.000	1.022	6.027	0.177	6.204
02:06:00	0.996	0.000	0.821	6.533	0.191	6.724
02:12:00	0.794	0.000	0.657	6.935	0.206	7.140
02:18:00	0.633	0.000	0.526	7.200	0.221	7.421
02:24:00	0.504	0.000	0.420	7.321	0.237	7.558
02:30:00	0.000	0.000	0.000	7.315	0.253	7.568
02:36:00	0.000	0.000	0.000	7.199	0.268	7.467
02:42:00	0.000	0.000	0.000	6.991	0.283	7.275
02:48:00	0.000	0.000	0.000	6.712	0.298	7.010
02:54:00	0.000	0.000	0.000	6.379	0.312	6.690
03:00:00	0.000	0.000	0.000	6.008	0.324	6.333
03:06:00	0.000	0.000	0.000	5.615	0.336	5.951
03:12:00	0.000	0.000	0.000	5.213	0.347	5.561
03:18:00	0.000	0.000	0.000	4.816	0.357	5.173

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	4.429	0.366	4.795
03:30:00	0.000	0.000	0.000	4.054	0.374	4.428
03:36:00	0.000	0.000	0.000	3.696	0.381	4.077
03:42:00	0.000	0.000	0.000	3.359	0.387	3.746
03:48:00	0.000	0.000	0.000	3.041	0.393	3.433
03:54:00	0.000	0.000	0.000	2.739	0.397	3.136
04:00:00	0.000	0.000	0.000	2.451	0.401	2.852
04:06:00	0.000	0.000	0.000	2.177	0.404	2.581
04:12:00	0.000	0.000	0.000	1.914	0.407	2.321
04:18:00	0.000	0.000	0.000	1.664	0.409	2.073
04:24:00	0.000	0.000	0.000	1.427	0.410	1.838
04:30:00	0.000	0.000	0.000	1.204	0.411	1.615
04:36:00	0.000	0.000	0.000	0.996	0.412	1.408
04:42:00	0.000	0.000	0.000	0.805	0.411	1.216
04:48:00	0.000	0.000	0.000	0.635	0.411	1.046
04:54:00	0.000	0.000	0.000	0.491	0.410	0.901
05:00:00	0.000	0.000	0.000	0.374	0.409	0.782
05:06:00	0.000	0.000	0.000	0.280	0.407	0.687
05:12:00	0.000	0.000	0.000	0.205	0.406	0.611
05:18:00	0.000	0.000	0.000	0.147	0.404	0.551
05:24:00	0.000	0.000	0.000	0.103	0.402	0.505
05:30:00	0.000	0.000	0.000	0.069	0.400	0.469
05:36:00	0.000	0.000	0.000	0.044	0.398	0.442
05:42:00	0.000	0.000	0.000	0.025	0.396	0.421
05:48:00	0.000	0.000	0.000	0.013	0.394	0.407
05:54:00	0.000	0.000	0.000	0.005	0.392	0.397
06:00:00	0.000	0.000	0.000	0.001	0.390	0.391
06:06:00	0.000	0.000	0.000	0.000	0.388	0.388
06:12:00	0.000	0.000	0.000	0.000	0.386	0.386
06:18:00	0.000	0.000	0.000	0.000	0.383	0.383
06:24:00	0.000	0.000	0.000	0.000	0.381	0.381
06:30:00	0.000	0.000	0.000	0.000	0.379	0.379
06:36:00	0.000	0.000	0.000	0.000	0.377	0.377
06:42:00	0.000	0.000	0.000	0.000	0.375	0.375
06:48:00	0.000	0.000	0.000	0.000	0.373	0.373

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.371	0.371
07:00:00	0.000	0.000	0.000	0.000	0.369	0.369
07:06:00	0.000	0.000	0.000	0.000	0.367	0.367
07:12:00	0.000	0.000	0.000	0.000	0.365	0.365
07:18:00	0.000	0.000	0.000	0.000	0.363	0.363
07:24:00	0.000	0.000	0.000	0.000	0.361	0.361
07:30:00	0.000	0.000	0.000	0.000	0.359	0.359
07:36:00	0.000	0.000	0.000	0.000	0.357	0.357
07:42:00	0.000	0.000	0.000	0.000	0.355	0.355
07:48:00	0.000	0.000	0.000	0.000	0.353	0.353
07:54:00	0.000	0.000	0.000	0.000	0.352	0.352
08:00:00	0.000	0.000	0.000	0.000	0.350	0.350
08:06:00	0.000	0.000	0.000	0.000	0.348	0.348
08:12:00	0.000	0.000	0.000	0.000	0.346	0.346
08:18:00	0.000	0.000	0.000	0.000	0.344	0.344
08:24:00	0.000	0.000	0.000	0.000	0.342	0.342
08:30:00	0.000	0.000	0.000	0.000	0.340	0.340
08:36:00	0.000	0.000	0.000	0.000	0.339	0.339
08:42:00	0.000	0.000	0.000	0.000	0.337	0.337
08:48:00	0.000	0.000	0.000	0.000	0.335	0.335
08:54:00	0.000	0.000	0.000	0.000	0.333	0.333
09:00:00	0.000	0.000	0.000	0.000	0.331	0.331
09:06:00	0.000	0.000	0.000	0.000	0.329	0.329
09:12:00	0.000	0.000	0.000	0.000	0.328	0.328
09:18:00	0.000	0.000	0.000	0.000	0.326	0.326
09:24:00	0.000	0.000	0.000	0.000	0.324	0.324
09:30:00	0.000	0.000	0.000	0.000	0.322	0.322
09:36:00	0.000	0.000	0.000	0.000	0.321	0.321
09:42:00	0.000	0.000	0.000	0.000	0.319	0.319
09:48:00	0.000	0.000	0.000	0.000	0.317	0.317
09:54:00	0.000	0.000	0.000	0.000	0.315	0.315
10:00:00	0.000	0.000	0.000	0.000	0.314	0.314
10:06:00	0.000	0.000	0.000	0.000	0.312	0.312
10:12:00	0.000	0.000	0.000	0.000	0.310	0.310
10:18:00	0.000	0.000	0.000	0.000	0.309	0.309

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.307	0.307
10:30:00	0.000	0.000	0.000	0.000	0.305	0.305
10:36:00	0.000	0.000	0.000	0.000	0.304	0.304
10:42:00	0.000	0.000	0.000	0.000	0.302	0.302
10:48:00	0.000	0.000	0.000	0.000	0.300	0.300
10:54:00	0.000	0.000	0.000	0.000	0.299	0.299
11:00:00	0.000	0.000	0.000	0.000	0.297	0.297
11:06:00	0.000	0.000	0.000	0.000	0.296	0.296
11:12:00	0.000	0.000	0.000	0.000	0.294	0.294
11:18:00	0.000	0.000	0.000	0.000	0.292	0.292
11:24:00	0.000	0.000	0.000	0.000	0.291	0.291
11:30:00	0.000	0.000	0.000	0.000	0.289	0.289
11:36:00	0.000	0.000	0.000	0.000	0.288	0.288
11:42:00	0.000	0.000	0.000	0.000	0.286	0.286
11:48:00	0.000	0.000	0.000	0.000	0.285	0.285
11:54:00	0.000	0.000	0.000	0.000	0.283	0.283
12:00:00	0.000	0.000	0.000	0.000	0.282	0.282
12:06:00	0.000	0.000	0.000	0.000	0.280	0.280
12:12:00	0.000	0.000	0.000	0.000	0.279	0.279
12:18:00	0.000	0.000	0.000	0.000	0.277	0.277
12:24:00	0.000	0.000	0.000	0.000	0.276	0.276
12:30:00	0.000	0.000	0.000	0.000	0.274	0.274
12:36:00	0.000	0.000	0.000	0.000	0.273	0.273
12:42:00	0.000	0.000	0.000	0.000	0.271	0.271
12:48:00	0.000	0.000	0.000	0.000	0.270	0.270
12:54:00	0.000	0.000	0.000	0.000	0.268	0.268
13:00:00	0.000	0.000	0.000	0.000	0.267	0.267
13:06:00	0.000	0.000	0.000	0.000	0.265	0.265
13:12:00	0.000	0.000	0.000	0.000	0.264	0.264
13:18:00	0.000	0.000	0.000	0.000	0.262	0.262
13:24:00	0.000	0.000	0.000	0.000	0.261	0.261
13:30:00	0.000	0.000	0.000	0.000	0.260	0.260
13:36:00	0.000	0.000	0.000	0.000	0.258	0.258
13:42:00	0.000	0.000	0.000	0.000	0.257	0.257
13:48:00	0.000	0.000	0.000	0.000	0.255	0.255

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.254	0.254
14:00:00	0.000	0.000	0.000	0.000	0.253	0.253
14:06:00	0.000	0.000	0.000	0.000	0.251	0.251
14:12:00	0.000	0.000	0.000	0.000	0.250	0.250
14:18:00	0.000	0.000	0.000	0.000	0.249	0.249
14:24:00	0.000	0.000	0.000	0.000	0.247	0.247
14:30:00	0.000	0.000	0.000	0.000	0.246	0.246
14:36:00	0.000	0.000	0.000	0.000	0.245	0.245
14:42:00	0.000	0.000	0.000	0.000	0.243	0.243
14:48:00	0.000	0.000	0.000	0.000	0.242	0.242
14:54:00	0.000	0.000	0.000	0.000	0.241	0.241
15:00:00	0.000	0.000	0.000	0.000	0.239	0.239
15:06:00	0.000	0.000	0.000	0.000	0.238	0.238
15:12:00	0.000	0.000	0.000	0.000	0.237	0.237
15:18:00	0.000	0.000	0.000	0.000	0.235	0.235
15:24:00	0.000	0.000	0.000	0.000	0.234	0.234
15:30:00	0.000	0.000	0.000	0.000	0.233	0.233
15:36:00	0.000	0.000	0.000	0.000	0.232	0.232
15:42:00	0.000	0.000	0.000	0.000	0.230	0.230
15:48:00	0.000	0.000	0.000	0.000	0.229	0.229
15:54:00	0.000	0.000	0.000	0.000	0.228	0.228
16:00:00	0.000	0.000	0.000	0.000	0.227	0.227
16:06:00	0.000	0.000	0.000	0.000	0.225	0.225
16:12:00	0.000	0.000	0.000	0.000	0.224	0.224
16:18:00	0.000	0.000	0.000	0.000	0.223	0.223
16:24:00	0.000	0.000	0.000	0.000	0.222	0.222
16:30:00	0.000	0.000	0.000	0.000	0.221	0.221
16:36:00	0.000	0.000	0.000	0.000	0.219	0.219
16:42:00	0.000	0.000	0.000	0.000	0.218	0.218
16:48:00	0.000	0.000	0.000	0.000	0.217	0.217
16:54:00	0.000	0.000	0.000	0.000	0.216	0.216
17:00:00	0.000	0.000	0.000	0.000	0.215	0.215
17:06:00	0.000	0.000	0.000	0.000	0.214	0.214
17:12:00	0.000	0.000	0.000	0.000	0.212	0.212
17:18:00	0.000	0.000	0.000	0.000	0.211	0.211

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.210	0.210
17:30:00	0.000	0.000	0.000	0.000	0.209	0.209
17:36:00	0.000	0.000	0.000	0.000	0.208	0.208
17:42:00	0.000	0.000	0.000	0.000	0.207	0.207
17:48:00	0.000	0.000	0.000	0.000	0.206	0.206
17:54:00	0.000	0.000	0.000	0.000	0.205	0.205
18:00:00	0.000	0.000	0.000	0.000	0.203	0.203
18:06:00	0.000	0.000	0.000	0.000	0.202	0.202
18:12:00	0.000	0.000	0.000	0.000	0.201	0.201
18:18:00	0.000	0.000	0.000	0.000	0.200	0.200
18:24:00	0.000	0.000	0.000	0.000	0.199	0.199
18:30:00	0.000	0.000	0.000	0.000	0.198	0.198
18:36:00	0.000	0.000	0.000	0.000	0.197	0.197
18:42:00	0.000	0.000	0.000	0.000	0.196	0.196
18:48:00	0.000	0.000	0.000	0.000	0.195	0.195
18:54:00	0.000	0.000	0.000	0.000	0.194	0.194
19:00:00	0.000	0.000	0.000	0.000	0.193	0.193
19:06:00	0.000	0.000	0.000	0.000	0.192	0.192
19:12:00	0.000	0.000	0.000	0.000	0.191	0.191
19:18:00	0.000	0.000	0.000	0.000	0.190	0.190
19:24:00	0.000	0.000	0.000	0.000	0.189	0.189
19:30:00	0.000	0.000	0.000	0.000	0.188	0.188
19:36:00	0.000	0.000	0.000	0.000	0.187	0.187
19:42:00	0.000	0.000	0.000	0.000	0.186	0.186
19:48:00	0.000	0.000	0.000	0.000	0.185	0.185
19:54:00	0.000	0.000	0.000	0.000	0.184	0.184
20:00:00	0.000	0.000	0.000	0.000	0.183	0.183
20:06:00	0.000	0.000	0.000	0.000	0.182	0.182
20:12:00	0.000	0.000	0.000	0.000	0.181	0.181
20:18:00	0.000	0.000	0.000	0.000	0.180	0.180
20:24:00	0.000	0.000	0.000	0.000	0.179	0.179
20:30:00	0.000	0.000	0.000	0.000	0.178	0.178
20:36:00	0.000	0.000	0.000	0.000	0.177	0.177
20:42:00	0.000	0.000	0.000	0.000	0.176	0.176
20:48:00	0.000	0.000	0.000	0.000	0.175	0.175

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.174	0.174
21:00:00	0.000	0.000	0.000	0.000	0.173	0.173
21:06:00	0.000	0.000	0.000	0.000	0.172	0.172
21:12:00	0.000	0.000	0.000	0.000	0.171	0.171
21:18:00	0.000	0.000	0.000	0.000	0.170	0.170
21:24:00	0.000	0.000	0.000	0.000	0.169	0.169
21:30:00	0.000	0.000	0.000	0.000	0.168	0.168
21:36:00	0.000	0.000	0.000	0.000	0.167	0.167
21:42:00	0.000	0.000	0.000	0.000	0.166	0.166
21:48:00	0.000	0.000	0.000	0.000	0.166	0.166
21:54:00	0.000	0.000	0.000	0.000	0.165	0.165
22:00:00	0.000	0.000	0.000	0.000	0.164	0.164
22:06:00	0.000	0.000	0.000	0.000	0.163	0.163
22:12:00	0.000	0.000	0.000	0.000	0.162	0.162
22:18:00	0.000	0.000	0.000	0.000	0.161	0.161
22:24:00	0.000	0.000	0.000	0.000	0.160	0.160
22:30:00	0.000	0.000	0.000	0.000	0.159	0.159
22:36:00	0.000	0.000	0.000	0.000	0.159	0.159
22:42:00	0.000	0.000	0.000	0.000	0.158	0.158
22:48:00	0.000	0.000	0.000	0.000	0.157	0.157
22:54:00	0.000	0.000	0.000	0.000	0.156	0.156
23:00:00	0.000	0.000	0.000	0.000	0.155	0.155
23:06:00	0.000	0.000	0.000	0.000	0.154	0.154
23:12:00	0.000	0.000	0.000	0.000	0.153	0.153
23:18:00	0.000	0.000	0.000	0.000	0.153	0.153
23:24:00	0.000	0.000	0.000	0.000	0.152	0.152
23:30:00	0.000	0.000	0.000	0.000	0.151	0.151
23:36:00	0.000	0.000	0.000	0.000	0.150	0.150
23:42:00	0.000	0.000	0.000	0.000	0.149	0.149
23:48:00	0.000	0.000	0.000	0.000	0.149	0.149
23:54:00	0.000	0.000	0.000	0.000	0.148	0.148
24:00:00	0.000	0.000	0.000	0.000	0.147	0.147
24:06:00	0.000	0.000	0.000	0.000	0.146	0.146
24:12:00	0.000	0.000	0.000	0.000	0.145	0.145
24:18:00	0.000	0.000	0.000	0.000	0.145	0.145

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.144	0.144
24:30:00	0.000	0.000	0.000	0.000	0.143	0.143
24:36:00	0.000	0.000	0.000	0.000	0.142	0.142
24:42:00	0.000	0.000	0.000	0.000	0.142	0.142
24:48:00	0.000	0.000	0.000	0.000	0.141	0.141
24:54:00	0.000	0.000	0.000	0.000	0.140	0.140
25:00:00	0.000	0.000	0.000	0.000	0.139	0.139
25:06:00	0.000	0.000	0.000	0.000	0.138	0.138
25:12:00	0.000	0.000	0.000	0.000	0.138	0.138
25:18:00	0.000	0.000	0.000	0.000	0.137	0.137
25:24:00	0.000	0.000	0.000	0.000	0.136	0.136
25:30:00	0.000	0.000	0.000	0.000	0.135	0.135
25:36:00	0.000	0.000	0.000	0.000	0.135	0.135
25:42:00	0.000	0.000	0.000	0.000	0.134	0.134
25:48:00	0.000	0.000	0.000	0.000	0.133	0.133
25:54:00	0.000	0.000	0.000	0.000	0.133	0.133
26:00:00	0.000	0.000	0.000	0.000	0.132	0.132
26:06:00	0.000	0.000	0.000	0.000	0.131	0.131
26:12:00	0.000	0.000	0.000	0.000	0.130	0.130
26:18:00	0.000	0.000	0.000	0.000	0.130	0.130
26:24:00	0.000	0.000	0.000	0.000	0.129	0.129
26:30:00	0.000	0.000	0.000	0.000	0.128	0.128
26:36:00	0.000	0.000	0.000	0.000	0.128	0.128
26:42:00	0.000	0.000	0.000	0.000	0.127	0.127
26:48:00	0.000	0.000	0.000	0.000	0.126	0.126
26:54:00	0.000	0.000	0.000	0.000	0.126	0.126
27:00:00	0.000	0.000	0.000	0.000	0.125	0.125
27:06:00	0.000	0.000	0.000	0.000	0.124	0.124
27:12:00	0.000	0.000	0.000	0.000	0.124	0.124
27:18:00	0.000	0.000	0.000	0.000	0.123	0.123
27:24:00	0.000	0.000	0.000	0.000	0.122	0.122
27:30:00	0.000	0.000	0.000	0.000	0.122	0.122
27:36:00	0.000	0.000	0.000	0.000	0.121	0.121
27:42:00	0.000	0.000	0.000	0.000	0.120	0.120
27:48:00	0.000	0.000	0.000	0.000	0.120	0.120

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.119	0.119
28:00:00	0.000	0.000	0.000	0.000	0.118	0.118
28:06:00	0.000	0.000	0.000	0.000	0.118	0.118
28:12:00	0.000	0.000	0.000	0.000	0.117	0.117
28:18:00	0.000	0.000	0.000	0.000	0.116	0.116
28:24:00	0.000	0.000	0.000	0.000	0.116	0.116
28:30:00	0.000	0.000	0.000	0.000	0.115	0.115
28:36:00	0.000	0.000	0.000	0.000	0.115	0.115
28:42:00	0.000	0.000	0.000	0.000	0.114	0.114

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	1.33 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB3 Bargoed Taff Tributary 1 Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB3 Bargoed Taff Tributary 1
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB3 Bargoed Taff Tributary 1*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	135.816
2	156.1269
5	220.9262
10	265.4771
30	335.3179
50	368.6049
75	395.8402
100	415.6449
100 + 40% CC	611.592
200	465.1004
1000	601.4774

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 10.5ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:40:52 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: B7A8-F4A6

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.11 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	4.56
Total Rainfall (mm):	61.97	Total flow (ML):	6.51
Peak Rainfall (mm):	6.48	Peak flow (m ³ /s):	0.61

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
00:00:00	0.513	0.000	0.288	0.000	0.009	0.009
00:06:00	0.645	0.000	0.364	0.000	0.009	0.009
00:12:00	0.809	0.000	0.459	0.001	0.009	0.010
00:18:00	1.015	0.000	0.580	0.003	0.009	0.012
00:24:00	1.272	0.000	0.734	0.005	0.009	0.014
00:30:00	1.592	0.000	0.929	0.009	0.009	0.018
00:36:00	1.989	0.000	1.177	0.015	0.009	0.024
00:42:00	2.482	0.000	1.493	0.022	0.009	0.031
00:48:00	3.089	0.000	1.897	0.032	0.009	0.041
00:54:00	3.833	0.000	2.414	0.046	0.009	0.054
01:00:00	4.732	0.000	3.071	0.063	0.009	0.072
01:06:00	5.774	0.000	3.884	0.085	0.009	0.094
01:12:00	6.482	0.000	4.539	0.113	0.009	0.122
01:18:00	5.774	0.000	4.203	0.147	0.009	0.156
01:24:00	4.732	0.000	3.556	0.188	0.010	0.198
01:30:00	3.833	0.000	2.955	0.235	0.010	0.245
01:36:00	3.089	0.000	2.429	0.285	0.011	0.296
01:42:00	2.482	0.000	1.983	0.337	0.011	0.349
01:48:00	1.989	0.000	1.609	0.389	0.012	0.402
01:54:00	1.592	0.000	1.300	0.440	0.013	0.453
02:00:00	1.272	0.000	1.047	0.487	0.014	0.501
02:06:00	1.015	0.000	0.841	0.528	0.015	0.543
02:12:00	0.809	0.000	0.674	0.561	0.016	0.577
02:18:00	0.645	0.000	0.539	0.582	0.018	0.600
02:24:00	0.513	0.000	0.430	0.592	0.019	0.611
02:30:00	0.000	0.000	0.000	0.592	0.020	0.612
02:36:00	0.000	0.000	0.000	0.582	0.021	0.604
02:42:00	0.000	0.000	0.000	0.565	0.023	0.588
02:48:00	0.000	0.000	0.000	0.543	0.024	0.567
02:54:00	0.000	0.000	0.000	0.516	0.025	0.541
03:00:00	0.000	0.000	0.000	0.486	0.026	0.512
03:06:00	0.000	0.000	0.000	0.454	0.027	0.481
03:12:00	0.000	0.000	0.000	0.422	0.028	0.449
03:18:00	0.000	0.000	0.000	0.390	0.028	0.418

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.358	0.029	0.387
03:30:00	0.000	0.000	0.000	0.328	0.030	0.358
03:36:00	0.000	0.000	0.000	0.299	0.030	0.329
03:42:00	0.000	0.000	0.000	0.272	0.031	0.303
03:48:00	0.000	0.000	0.000	0.246	0.031	0.277
03:54:00	0.000	0.000	0.000	0.222	0.032	0.253
04:00:00	0.000	0.000	0.000	0.198	0.032	0.230
04:06:00	0.000	0.000	0.000	0.176	0.032	0.208
04:12:00	0.000	0.000	0.000	0.155	0.032	0.187
04:18:00	0.000	0.000	0.000	0.135	0.033	0.167
04:24:00	0.000	0.000	0.000	0.116	0.033	0.148
04:30:00	0.000	0.000	0.000	0.097	0.033	0.130
04:36:00	0.000	0.000	0.000	0.081	0.033	0.113
04:42:00	0.000	0.000	0.000	0.065	0.033	0.098
04:48:00	0.000	0.000	0.000	0.051	0.033	0.084
04:54:00	0.000	0.000	0.000	0.040	0.033	0.072
05:00:00	0.000	0.000	0.000	0.030	0.033	0.063
05:06:00	0.000	0.000	0.000	0.023	0.032	0.055
05:12:00	0.000	0.000	0.000	0.017	0.032	0.049
05:18:00	0.000	0.000	0.000	0.012	0.032	0.044
05:24:00	0.000	0.000	0.000	0.008	0.032	0.040
05:30:00	0.000	0.000	0.000	0.006	0.032	0.037
05:36:00	0.000	0.000	0.000	0.004	0.032	0.035
05:42:00	0.000	0.000	0.000	0.002	0.032	0.034
05:48:00	0.000	0.000	0.000	0.001	0.031	0.032
05:54:00	0.000	0.000	0.000	0.000	0.031	0.032
06:00:00	0.000	0.000	0.000	0.000	0.031	0.031
06:06:00	0.000	0.000	0.000	0.000	0.031	0.031
06:12:00	0.000	0.000	0.000	0.000	0.031	0.031
06:18:00	0.000	0.000	0.000	0.000	0.031	0.031
06:24:00	0.000	0.000	0.000	0.000	0.030	0.030
06:30:00	0.000	0.000	0.000	0.000	0.030	0.030
06:36:00	0.000	0.000	0.000	0.000	0.030	0.030
06:42:00	0.000	0.000	0.000	0.000	0.030	0.030
06:48:00	0.000	0.000	0.000	0.000	0.030	0.030

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.030	0.030
07:00:00	0.000	0.000	0.000	0.000	0.029	0.029
07:06:00	0.000	0.000	0.000	0.000	0.029	0.029
07:12:00	0.000	0.000	0.000	0.000	0.029	0.029
07:18:00	0.000	0.000	0.000	0.000	0.029	0.029
07:24:00	0.000	0.000	0.000	0.000	0.029	0.029
07:30:00	0.000	0.000	0.000	0.000	0.029	0.029
07:36:00	0.000	0.000	0.000	0.000	0.028	0.028
07:42:00	0.000	0.000	0.000	0.000	0.028	0.028
07:48:00	0.000	0.000	0.000	0.000	0.028	0.028
07:54:00	0.000	0.000	0.000	0.000	0.028	0.028
08:00:00	0.000	0.000	0.000	0.000	0.028	0.028
08:06:00	0.000	0.000	0.000	0.000	0.028	0.028
08:12:00	0.000	0.000	0.000	0.000	0.028	0.028
08:18:00	0.000	0.000	0.000	0.000	0.027	0.027
08:24:00	0.000	0.000	0.000	0.000	0.027	0.027
08:30:00	0.000	0.000	0.000	0.000	0.027	0.027
08:36:00	0.000	0.000	0.000	0.000	0.027	0.027
08:42:00	0.000	0.000	0.000	0.000	0.027	0.027
08:48:00	0.000	0.000	0.000	0.000	0.027	0.027
08:54:00	0.000	0.000	0.000	0.000	0.027	0.027
09:00:00	0.000	0.000	0.000	0.000	0.026	0.026
09:06:00	0.000	0.000	0.000	0.000	0.026	0.026
09:12:00	0.000	0.000	0.000	0.000	0.026	0.026
09:18:00	0.000	0.000	0.000	0.000	0.026	0.026
09:24:00	0.000	0.000	0.000	0.000	0.026	0.026
09:30:00	0.000	0.000	0.000	0.000	0.026	0.026
09:36:00	0.000	0.000	0.000	0.000	0.026	0.026
09:42:00	0.000	0.000	0.000	0.000	0.025	0.025
09:48:00	0.000	0.000	0.000	0.000	0.025	0.025
09:54:00	0.000	0.000	0.000	0.000	0.025	0.025
10:00:00	0.000	0.000	0.000	0.000	0.025	0.025
10:06:00	0.000	0.000	0.000	0.000	0.025	0.025
10:12:00	0.000	0.000	0.000	0.000	0.025	0.025
10:18:00	0.000	0.000	0.000	0.000	0.025	0.025

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.024	0.024
10:30:00	0.000	0.000	0.000	0.000	0.024	0.024
10:36:00	0.000	0.000	0.000	0.000	0.024	0.024
10:42:00	0.000	0.000	0.000	0.000	0.024	0.024
10:48:00	0.000	0.000	0.000	0.000	0.024	0.024
10:54:00	0.000	0.000	0.000	0.000	0.024	0.024
11:00:00	0.000	0.000	0.000	0.000	0.024	0.024
11:06:00	0.000	0.000	0.000	0.000	0.024	0.024
11:12:00	0.000	0.000	0.000	0.000	0.023	0.023
11:18:00	0.000	0.000	0.000	0.000	0.023	0.023
11:24:00	0.000	0.000	0.000	0.000	0.023	0.023
11:30:00	0.000	0.000	0.000	0.000	0.023	0.023
11:36:00	0.000	0.000	0.000	0.000	0.023	0.023
11:42:00	0.000	0.000	0.000	0.000	0.023	0.023
11:48:00	0.000	0.000	0.000	0.000	0.023	0.023
11:54:00	0.000	0.000	0.000	0.000	0.023	0.023
12:00:00	0.000	0.000	0.000	0.000	0.022	0.022
12:06:00	0.000	0.000	0.000	0.000	0.022	0.022
12:12:00	0.000	0.000	0.000	0.000	0.022	0.022
12:18:00	0.000	0.000	0.000	0.000	0.022	0.022
12:24:00	0.000	0.000	0.000	0.000	0.022	0.022
12:30:00	0.000	0.000	0.000	0.000	0.022	0.022
12:36:00	0.000	0.000	0.000	0.000	0.022	0.022
12:42:00	0.000	0.000	0.000	0.000	0.022	0.022
12:48:00	0.000	0.000	0.000	0.000	0.021	0.021
12:54:00	0.000	0.000	0.000	0.000	0.021	0.021
13:00:00	0.000	0.000	0.000	0.000	0.021	0.021
13:06:00	0.000	0.000	0.000	0.000	0.021	0.021
13:12:00	0.000	0.000	0.000	0.000	0.021	0.021
13:18:00	0.000	0.000	0.000	0.000	0.021	0.021
13:24:00	0.000	0.000	0.000	0.000	0.021	0.021
13:30:00	0.000	0.000	0.000	0.000	0.021	0.021
13:36:00	0.000	0.000	0.000	0.000	0.021	0.021
13:42:00	0.000	0.000	0.000	0.000	0.020	0.020
13:48:00	0.000	0.000	0.000	0.000	0.020	0.020

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.020	0.020
14:00:00	0.000	0.000	0.000	0.000	0.020	0.020
14:06:00	0.000	0.000	0.000	0.000	0.020	0.020
14:12:00	0.000	0.000	0.000	0.000	0.020	0.020
14:18:00	0.000	0.000	0.000	0.000	0.020	0.020
14:24:00	0.000	0.000	0.000	0.000	0.020	0.020
14:30:00	0.000	0.000	0.000	0.000	0.020	0.020
14:36:00	0.000	0.000	0.000	0.000	0.019	0.019
14:42:00	0.000	0.000	0.000	0.000	0.019	0.019
14:48:00	0.000	0.000	0.000	0.000	0.019	0.019
14:54:00	0.000	0.000	0.000	0.000	0.019	0.019
15:00:00	0.000	0.000	0.000	0.000	0.019	0.019
15:06:00	0.000	0.000	0.000	0.000	0.019	0.019
15:12:00	0.000	0.000	0.000	0.000	0.019	0.019
15:18:00	0.000	0.000	0.000	0.000	0.019	0.019
15:24:00	0.000	0.000	0.000	0.000	0.019	0.019
15:30:00	0.000	0.000	0.000	0.000	0.019	0.019
15:36:00	0.000	0.000	0.000	0.000	0.018	0.018
15:42:00	0.000	0.000	0.000	0.000	0.018	0.018
15:48:00	0.000	0.000	0.000	0.000	0.018	0.018
15:54:00	0.000	0.000	0.000	0.000	0.018	0.018
16:00:00	0.000	0.000	0.000	0.000	0.018	0.018
16:06:00	0.000	0.000	0.000	0.000	0.018	0.018
16:12:00	0.000	0.000	0.000	0.000	0.018	0.018
16:18:00	0.000	0.000	0.000	0.000	0.018	0.018
16:24:00	0.000	0.000	0.000	0.000	0.018	0.018
16:30:00	0.000	0.000	0.000	0.000	0.018	0.018
16:36:00	0.000	0.000	0.000	0.000	0.017	0.017
16:42:00	0.000	0.000	0.000	0.000	0.017	0.017
16:48:00	0.000	0.000	0.000	0.000	0.017	0.017
16:54:00	0.000	0.000	0.000	0.000	0.017	0.017
17:00:00	0.000	0.000	0.000	0.000	0.017	0.017
17:06:00	0.000	0.000	0.000	0.000	0.017	0.017
17:12:00	0.000	0.000	0.000	0.000	0.017	0.017
17:18:00	0.000	0.000	0.000	0.000	0.017	0.017

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.017	0.017
17:30:00	0.000	0.000	0.000	0.000	0.017	0.017
17:36:00	0.000	0.000	0.000	0.000	0.017	0.017
17:42:00	0.000	0.000	0.000	0.000	0.016	0.016
17:48:00	0.000	0.000	0.000	0.000	0.016	0.016
17:54:00	0.000	0.000	0.000	0.000	0.016	0.016
18:00:00	0.000	0.000	0.000	0.000	0.016	0.016
18:06:00	0.000	0.000	0.000	0.000	0.016	0.016
18:12:00	0.000	0.000	0.000	0.000	0.016	0.016
18:18:00	0.000	0.000	0.000	0.000	0.016	0.016
18:24:00	0.000	0.000	0.000	0.000	0.016	0.016
18:30:00	0.000	0.000	0.000	0.000	0.016	0.016
18:36:00	0.000	0.000	0.000	0.000	0.016	0.016
18:42:00	0.000	0.000	0.000	0.000	0.016	0.016
18:48:00	0.000	0.000	0.000	0.000	0.016	0.016
18:54:00	0.000	0.000	0.000	0.000	0.015	0.015
19:00:00	0.000	0.000	0.000	0.000	0.015	0.015
19:06:00	0.000	0.000	0.000	0.000	0.015	0.015
19:12:00	0.000	0.000	0.000	0.000	0.015	0.015
19:18:00	0.000	0.000	0.000	0.000	0.015	0.015
19:24:00	0.000	0.000	0.000	0.000	0.015	0.015
19:30:00	0.000	0.000	0.000	0.000	0.015	0.015
19:36:00	0.000	0.000	0.000	0.000	0.015	0.015
19:42:00	0.000	0.000	0.000	0.000	0.015	0.015
19:48:00	0.000	0.000	0.000	0.000	0.015	0.015
19:54:00	0.000	0.000	0.000	0.000	0.015	0.015
20:00:00	0.000	0.000	0.000	0.000	0.015	0.015
20:06:00	0.000	0.000	0.000	0.000	0.014	0.014
20:12:00	0.000	0.000	0.000	0.000	0.014	0.014
20:18:00	0.000	0.000	0.000	0.000	0.014	0.014
20:24:00	0.000	0.000	0.000	0.000	0.014	0.014
20:30:00	0.000	0.000	0.000	0.000	0.014	0.014
20:36:00	0.000	0.000	0.000	0.000	0.014	0.014
20:42:00	0.000	0.000	0.000	0.000	0.014	0.014
20:48:00	0.000	0.000	0.000	0.000	0.014	0.014

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.014	0.014
21:00:00	0.000	0.000	0.000	0.000	0.014	0.014
21:06:00	0.000	0.000	0.000	0.000	0.014	0.014
21:12:00	0.000	0.000	0.000	0.000	0.014	0.014
21:18:00	0.000	0.000	0.000	0.000	0.014	0.014
21:24:00	0.000	0.000	0.000	0.000	0.013	0.013
21:30:00	0.000	0.000	0.000	0.000	0.013	0.013
21:36:00	0.000	0.000	0.000	0.000	0.013	0.013
21:42:00	0.000	0.000	0.000	0.000	0.013	0.013
21:48:00	0.000	0.000	0.000	0.000	0.013	0.013
21:54:00	0.000	0.000	0.000	0.000	0.013	0.013
22:00:00	0.000	0.000	0.000	0.000	0.013	0.013
22:06:00	0.000	0.000	0.000	0.000	0.013	0.013
22:12:00	0.000	0.000	0.000	0.000	0.013	0.013
22:18:00	0.000	0.000	0.000	0.000	0.013	0.013
22:24:00	0.000	0.000	0.000	0.000	0.013	0.013
22:30:00	0.000	0.000	0.000	0.000	0.013	0.013
22:36:00	0.000	0.000	0.000	0.000	0.013	0.013
22:42:00	0.000	0.000	0.000	0.000	0.013	0.013
22:48:00	0.000	0.000	0.000	0.000	0.013	0.013
22:54:00	0.000	0.000	0.000	0.000	0.012	0.012
23:00:00	0.000	0.000	0.000	0.000	0.012	0.012
23:06:00	0.000	0.000	0.000	0.000	0.012	0.012
23:12:00	0.000	0.000	0.000	0.000	0.012	0.012
23:18:00	0.000	0.000	0.000	0.000	0.012	0.012
23:24:00	0.000	0.000	0.000	0.000	0.012	0.012
23:30:00	0.000	0.000	0.000	0.000	0.012	0.012
23:36:00	0.000	0.000	0.000	0.000	0.012	0.012
23:42:00	0.000	0.000	0.000	0.000	0.012	0.012
23:48:00	0.000	0.000	0.000	0.000	0.012	0.012
23:54:00	0.000	0.000	0.000	0.000	0.012	0.012
24:00:00	0.000	0.000	0.000	0.000	0.012	0.012
24:06:00	0.000	0.000	0.000	0.000	0.012	0.012
24:12:00	0.000	0.000	0.000	0.000	0.012	0.012
24:18:00	0.000	0.000	0.000	0.000	0.012	0.012

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.011	0.011
24:30:00	0.000	0.000	0.000	0.000	0.011	0.011
24:36:00	0.000	0.000	0.000	0.000	0.011	0.011
24:42:00	0.000	0.000	0.000	0.000	0.011	0.011
24:48:00	0.000	0.000	0.000	0.000	0.011	0.011
24:54:00	0.000	0.000	0.000	0.000	0.011	0.011
25:00:00	0.000	0.000	0.000	0.000	0.011	0.011
25:06:00	0.000	0.000	0.000	0.000	0.011	0.011
25:12:00	0.000	0.000	0.000	0.000	0.011	0.011
25:18:00	0.000	0.000	0.000	0.000	0.011	0.011
25:24:00	0.000	0.000	0.000	0.000	0.011	0.011
25:30:00	0.000	0.000	0.000	0.000	0.011	0.011
25:36:00	0.000	0.000	0.000	0.000	0.011	0.011
25:42:00	0.000	0.000	0.000	0.000	0.011	0.011
25:48:00	0.000	0.000	0.000	0.000	0.011	0.011
25:54:00	0.000	0.000	0.000	0.000	0.011	0.011
26:00:00	0.000	0.000	0.000	0.000	0.011	0.011
26:06:00	0.000	0.000	0.000	0.000	0.010	0.010
26:12:00	0.000	0.000	0.000	0.000	0.010	0.010
26:18:00	0.000	0.000	0.000	0.000	0.010	0.010
26:24:00	0.000	0.000	0.000	0.000	0.010	0.010
26:30:00	0.000	0.000	0.000	0.000	0.010	0.010
26:36:00	0.000	0.000	0.000	0.000	0.010	0.010
26:42:00	0.000	0.000	0.000	0.000	0.010	0.010
26:48:00	0.000	0.000	0.000	0.000	0.010	0.010
26:54:00	0.000	0.000	0.000	0.000	0.010	0.010
27:00:00	0.000	0.000	0.000	0.000	0.010	0.010
27:06:00	0.000	0.000	0.000	0.000	0.010	0.010
27:12:00	0.000	0.000	0.000	0.000	0.010	0.010
27:18:00	0.000	0.000	0.000	0.000	0.010	0.010
27:24:00	0.000	0.000	0.000	0.000	0.010	0.010
27:30:00	0.000	0.000	0.000	0.000	0.010	0.010
27:36:00	0.000	0.000	0.000	0.000	0.010	0.010
27:42:00	0.000	0.000	0.000	0.000	0.010	0.010
27:48:00	0.000	0.000	0.000	0.000	0.010	0.010

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.009	0.009
28:00:00	0.000	0.000	0.000	0.000	0.009	0.009
28:06:00	0.000	0.000	0.000	0.000	0.009	0.009
28:12:00	0.000	0.000	0.000	0.000	0.009	0.009
28:18:00	0.000	0.000	0.000	0.000	0.009	0.009
28:24:00	0.000	0.000	0.000	0.000	0.009	0.009
28:30:00	0.000	0.000	0.000	0.000	0.009	0.009
28:36:00	0.000	0.000	0.000	0.000	0.009	0.009
28:42:00	0.000	0.000	0.000	0.000	0.009	0.009
28:48:00	0.000	0.000	0.000	0.000	0.009	0.009
28:54:00	0.000	0.000	0.000	0.000	0.009	0.009

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.11 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB3 Bargoed Taff Tributary 2 Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB3 Bargoed Taff Tributary 2
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB3 Bargoed Taff Tributary 2*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	299.1106
2	343.8202
5	486.4448
10	584.4894
30	738.1717
50	811.4111
75	871.3321
100	914.903
100 + 40% CC	1345.891
200	1023.68
1000	1323.646

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 23.22ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:44:34 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: 0273-7883

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.23 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	10.03
Total Rainfall (mm):	61.71	Total flow (ML):	14.33
Peak Rainfall (mm):	6.46	Peak flow (m ³ /s):	1.35

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.98	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.02	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.511	0.000	0.287	0.000	0.020	0.020
00:06:00	0.642	0.000	0.362	0.001	0.020	0.020
00:12:00	0.806	0.000	0.458	0.003	0.020	0.022
00:18:00	1.011	0.000	0.578	0.006	0.019	0.026
00:24:00	1.266	0.000	0.731	0.012	0.019	0.031
00:30:00	1.585	0.000	0.925	0.021	0.019	0.040
00:36:00	1.981	0.000	1.172	0.033	0.019	0.052
00:42:00	2.471	0.000	1.486	0.049	0.019	0.068
00:48:00	3.076	0.000	1.889	0.071	0.019	0.091
00:54:00	3.817	0.000	2.403	0.100	0.019	0.120
01:00:00	4.712	0.000	3.057	0.138	0.020	0.158
01:06:00	5.750	0.000	3.865	0.187	0.020	0.207
01:12:00	6.455	0.000	4.517	0.248	0.020	0.268
01:18:00	5.750	0.000	4.181	0.324	0.021	0.345
01:24:00	4.712	0.000	3.537	0.414	0.022	0.436
01:30:00	3.817	0.000	2.939	0.517	0.022	0.539
01:36:00	3.076	0.000	2.416	0.627	0.024	0.651
01:42:00	2.471	0.000	1.972	0.742	0.025	0.767
01:48:00	1.981	0.000	1.600	0.857	0.027	0.884
01:54:00	1.585	0.000	1.293	0.969	0.029	0.997
02:00:00	1.266	0.000	1.042	1.072	0.031	1.103
02:06:00	1.011	0.000	0.836	1.162	0.033	1.195
02:12:00	0.806	0.000	0.670	1.233	0.036	1.269
02:18:00	0.642	0.000	0.536	1.281	0.039	1.320
02:24:00	0.511	0.000	0.428	1.303	0.042	1.344
02:30:00	0.000	0.000	0.000	1.302	0.044	1.346
02:36:00	0.000	0.000	0.000	1.281	0.047	1.328
02:42:00	0.000	0.000	0.000	1.244	0.050	1.294
02:48:00	0.000	0.000	0.000	1.194	0.052	1.247
02:54:00	0.000	0.000	0.000	1.135	0.055	1.190
03:00:00	0.000	0.000	0.000	1.069	0.057	1.126
03:06:00	0.000	0.000	0.000	0.999	0.059	1.059
03:12:00	0.000	0.000	0.000	0.928	0.061	0.989
03:18:00	0.000	0.000	0.000	0.857	0.063	0.920

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.788	0.064	0.853
03:30:00	0.000	0.000	0.000	0.722	0.066	0.787
03:36:00	0.000	0.000	0.000	0.658	0.067	0.725
03:42:00	0.000	0.000	0.000	0.598	0.068	0.666
03:48:00	0.000	0.000	0.000	0.541	0.069	0.610
03:54:00	0.000	0.000	0.000	0.488	0.070	0.557
04:00:00	0.000	0.000	0.000	0.436	0.071	0.507
04:06:00	0.000	0.000	0.000	0.388	0.071	0.459
04:12:00	0.000	0.000	0.000	0.341	0.072	0.412
04:18:00	0.000	0.000	0.000	0.296	0.072	0.368
04:24:00	0.000	0.000	0.000	0.254	0.072	0.326
04:30:00	0.000	0.000	0.000	0.214	0.072	0.287
04:36:00	0.000	0.000	0.000	0.177	0.072	0.250
04:42:00	0.000	0.000	0.000	0.143	0.072	0.216
04:48:00	0.000	0.000	0.000	0.113	0.072	0.185
04:54:00	0.000	0.000	0.000	0.087	0.072	0.160
05:00:00	0.000	0.000	0.000	0.067	0.072	0.138
05:06:00	0.000	0.000	0.000	0.050	0.072	0.122
05:12:00	0.000	0.000	0.000	0.037	0.071	0.108
05:18:00	0.000	0.000	0.000	0.026	0.071	0.097
05:24:00	0.000	0.000	0.000	0.018	0.071	0.089
05:30:00	0.000	0.000	0.000	0.012	0.070	0.083
05:36:00	0.000	0.000	0.000	0.008	0.070	0.078
05:42:00	0.000	0.000	0.000	0.005	0.070	0.074
05:48:00	0.000	0.000	0.000	0.002	0.069	0.072
05:54:00	0.000	0.000	0.000	0.001	0.069	0.070
06:00:00	0.000	0.000	0.000	0.000	0.069	0.069
06:06:00	0.000	0.000	0.000	0.000	0.068	0.068
06:12:00	0.000	0.000	0.000	0.000	0.068	0.068
06:18:00	0.000	0.000	0.000	0.000	0.067	0.067
06:24:00	0.000	0.000	0.000	0.000	0.067	0.067
06:30:00	0.000	0.000	0.000	0.000	0.067	0.067
06:36:00	0.000	0.000	0.000	0.000	0.066	0.066
06:42:00	0.000	0.000	0.000	0.000	0.066	0.066
06:48:00	0.000	0.000	0.000	0.000	0.066	0.066

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.065	0.065
07:00:00	0.000	0.000	0.000	0.000	0.065	0.065
07:06:00	0.000	0.000	0.000	0.000	0.065	0.065
07:12:00	0.000	0.000	0.000	0.000	0.064	0.064
07:18:00	0.000	0.000	0.000	0.000	0.064	0.064
07:24:00	0.000	0.000	0.000	0.000	0.064	0.064
07:30:00	0.000	0.000	0.000	0.000	0.063	0.063
07:36:00	0.000	0.000	0.000	0.000	0.063	0.063
07:42:00	0.000	0.000	0.000	0.000	0.063	0.063
07:48:00	0.000	0.000	0.000	0.000	0.062	0.062
07:54:00	0.000	0.000	0.000	0.000	0.062	0.062
08:00:00	0.000	0.000	0.000	0.000	0.062	0.062
08:06:00	0.000	0.000	0.000	0.000	0.061	0.061
08:12:00	0.000	0.000	0.000	0.000	0.061	0.061
08:18:00	0.000	0.000	0.000	0.000	0.061	0.061
08:24:00	0.000	0.000	0.000	0.000	0.060	0.060
08:30:00	0.000	0.000	0.000	0.000	0.060	0.060
08:36:00	0.000	0.000	0.000	0.000	0.060	0.060
08:42:00	0.000	0.000	0.000	0.000	0.059	0.059
08:48:00	0.000	0.000	0.000	0.000	0.059	0.059
08:54:00	0.000	0.000	0.000	0.000	0.059	0.059
09:00:00	0.000	0.000	0.000	0.000	0.058	0.058
09:06:00	0.000	0.000	0.000	0.000	0.058	0.058
09:12:00	0.000	0.000	0.000	0.000	0.058	0.058
09:18:00	0.000	0.000	0.000	0.000	0.057	0.057
09:24:00	0.000	0.000	0.000	0.000	0.057	0.057
09:30:00	0.000	0.000	0.000	0.000	0.057	0.057
09:36:00	0.000	0.000	0.000	0.000	0.056	0.056
09:42:00	0.000	0.000	0.000	0.000	0.056	0.056
09:48:00	0.000	0.000	0.000	0.000	0.056	0.056
09:54:00	0.000	0.000	0.000	0.000	0.056	0.056
10:00:00	0.000	0.000	0.000	0.000	0.055	0.055
10:06:00	0.000	0.000	0.000	0.000	0.055	0.055
10:12:00	0.000	0.000	0.000	0.000	0.055	0.055
10:18:00	0.000	0.000	0.000	0.000	0.054	0.054

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.054	0.054
10:30:00	0.000	0.000	0.000	0.000	0.054	0.054
10:36:00	0.000	0.000	0.000	0.000	0.053	0.053
10:42:00	0.000	0.000	0.000	0.000	0.053	0.053
10:48:00	0.000	0.000	0.000	0.000	0.053	0.053
10:54:00	0.000	0.000	0.000	0.000	0.053	0.053
11:00:00	0.000	0.000	0.000	0.000	0.052	0.052
11:06:00	0.000	0.000	0.000	0.000	0.052	0.052
11:12:00	0.000	0.000	0.000	0.000	0.052	0.052
11:18:00	0.000	0.000	0.000	0.000	0.051	0.051
11:24:00	0.000	0.000	0.000	0.000	0.051	0.051
11:30:00	0.000	0.000	0.000	0.000	0.051	0.051
11:36:00	0.000	0.000	0.000	0.000	0.051	0.051
11:42:00	0.000	0.000	0.000	0.000	0.050	0.050
11:48:00	0.000	0.000	0.000	0.000	0.050	0.050
11:54:00	0.000	0.000	0.000	0.000	0.050	0.050
12:00:00	0.000	0.000	0.000	0.000	0.050	0.050
12:06:00	0.000	0.000	0.000	0.000	0.049	0.049
12:12:00	0.000	0.000	0.000	0.000	0.049	0.049
12:18:00	0.000	0.000	0.000	0.000	0.049	0.049
12:24:00	0.000	0.000	0.000	0.000	0.048	0.048
12:30:00	0.000	0.000	0.000	0.000	0.048	0.048
12:36:00	0.000	0.000	0.000	0.000	0.048	0.048
12:42:00	0.000	0.000	0.000	0.000	0.048	0.048
12:48:00	0.000	0.000	0.000	0.000	0.047	0.047
12:54:00	0.000	0.000	0.000	0.000	0.047	0.047
13:00:00	0.000	0.000	0.000	0.000	0.047	0.047
13:06:00	0.000	0.000	0.000	0.000	0.047	0.047
13:12:00	0.000	0.000	0.000	0.000	0.046	0.046
13:18:00	0.000	0.000	0.000	0.000	0.046	0.046
13:24:00	0.000	0.000	0.000	0.000	0.046	0.046
13:30:00	0.000	0.000	0.000	0.000	0.046	0.046
13:36:00	0.000	0.000	0.000	0.000	0.045	0.045
13:42:00	0.000	0.000	0.000	0.000	0.045	0.045
13:48:00	0.000	0.000	0.000	0.000	0.045	0.045

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.045	0.045
14:00:00	0.000	0.000	0.000	0.000	0.044	0.044
14:06:00	0.000	0.000	0.000	0.000	0.044	0.044
14:12:00	0.000	0.000	0.000	0.000	0.044	0.044
14:18:00	0.000	0.000	0.000	0.000	0.044	0.044
14:24:00	0.000	0.000	0.000	0.000	0.043	0.043
14:30:00	0.000	0.000	0.000	0.000	0.043	0.043
14:36:00	0.000	0.000	0.000	0.000	0.043	0.043
14:42:00	0.000	0.000	0.000	0.000	0.043	0.043
14:48:00	0.000	0.000	0.000	0.000	0.043	0.043
14:54:00	0.000	0.000	0.000	0.000	0.042	0.042
15:00:00	0.000	0.000	0.000	0.000	0.042	0.042
15:06:00	0.000	0.000	0.000	0.000	0.042	0.042
15:12:00	0.000	0.000	0.000	0.000	0.042	0.042
15:18:00	0.000	0.000	0.000	0.000	0.041	0.041
15:24:00	0.000	0.000	0.000	0.000	0.041	0.041
15:30:00	0.000	0.000	0.000	0.000	0.041	0.041
15:36:00	0.000	0.000	0.000	0.000	0.041	0.041
15:42:00	0.000	0.000	0.000	0.000	0.041	0.041
15:48:00	0.000	0.000	0.000	0.000	0.040	0.040
15:54:00	0.000	0.000	0.000	0.000	0.040	0.040
16:00:00	0.000	0.000	0.000	0.000	0.040	0.040
16:06:00	0.000	0.000	0.000	0.000	0.040	0.040
16:12:00	0.000	0.000	0.000	0.000	0.039	0.039
16:18:00	0.000	0.000	0.000	0.000	0.039	0.039
16:24:00	0.000	0.000	0.000	0.000	0.039	0.039
16:30:00	0.000	0.000	0.000	0.000	0.039	0.039
16:36:00	0.000	0.000	0.000	0.000	0.039	0.039
16:42:00	0.000	0.000	0.000	0.000	0.038	0.038
16:48:00	0.000	0.000	0.000	0.000	0.038	0.038
16:54:00	0.000	0.000	0.000	0.000	0.038	0.038
17:00:00	0.000	0.000	0.000	0.000	0.038	0.038
17:06:00	0.000	0.000	0.000	0.000	0.038	0.038
17:12:00	0.000	0.000	0.000	0.000	0.037	0.037
17:18:00	0.000	0.000	0.000	0.000	0.037	0.037

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.037	0.037
17:30:00	0.000	0.000	0.000	0.000	0.037	0.037
17:36:00	0.000	0.000	0.000	0.000	0.037	0.037
17:42:00	0.000	0.000	0.000	0.000	0.036	0.036
17:48:00	0.000	0.000	0.000	0.000	0.036	0.036
17:54:00	0.000	0.000	0.000	0.000	0.036	0.036
18:00:00	0.000	0.000	0.000	0.000	0.036	0.036
18:06:00	0.000	0.000	0.000	0.000	0.036	0.036
18:12:00	0.000	0.000	0.000	0.000	0.035	0.035
18:18:00	0.000	0.000	0.000	0.000	0.035	0.035
18:24:00	0.000	0.000	0.000	0.000	0.035	0.035
18:30:00	0.000	0.000	0.000	0.000	0.035	0.035
18:36:00	0.000	0.000	0.000	0.000	0.035	0.035
18:42:00	0.000	0.000	0.000	0.000	0.034	0.034
18:48:00	0.000	0.000	0.000	0.000	0.034	0.034
18:54:00	0.000	0.000	0.000	0.000	0.034	0.034
19:00:00	0.000	0.000	0.000	0.000	0.034	0.034
19:06:00	0.000	0.000	0.000	0.000	0.034	0.034
19:12:00	0.000	0.000	0.000	0.000	0.034	0.034
19:18:00	0.000	0.000	0.000	0.000	0.033	0.033
19:24:00	0.000	0.000	0.000	0.000	0.033	0.033
19:30:00	0.000	0.000	0.000	0.000	0.033	0.033
19:36:00	0.000	0.000	0.000	0.000	0.033	0.033
19:42:00	0.000	0.000	0.000	0.000	0.033	0.033
19:48:00	0.000	0.000	0.000	0.000	0.032	0.032
19:54:00	0.000	0.000	0.000	0.000	0.032	0.032
20:00:00	0.000	0.000	0.000	0.000	0.032	0.032
20:06:00	0.000	0.000	0.000	0.000	0.032	0.032
20:12:00	0.000	0.000	0.000	0.000	0.032	0.032
20:18:00	0.000	0.000	0.000	0.000	0.032	0.032
20:24:00	0.000	0.000	0.000	0.000	0.031	0.031
20:30:00	0.000	0.000	0.000	0.000	0.031	0.031
20:36:00	0.000	0.000	0.000	0.000	0.031	0.031
20:42:00	0.000	0.000	0.000	0.000	0.031	0.031
20:48:00	0.000	0.000	0.000	0.000	0.031	0.031

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.031	0.031
21:00:00	0.000	0.000	0.000	0.000	0.030	0.030
21:06:00	0.000	0.000	0.000	0.000	0.030	0.030
21:12:00	0.000	0.000	0.000	0.000	0.030	0.030
21:18:00	0.000	0.000	0.000	0.000	0.030	0.030
21:24:00	0.000	0.000	0.000	0.000	0.030	0.030
21:30:00	0.000	0.000	0.000	0.000	0.030	0.030
21:36:00	0.000	0.000	0.000	0.000	0.029	0.029
21:42:00	0.000	0.000	0.000	0.000	0.029	0.029
21:48:00	0.000	0.000	0.000	0.000	0.029	0.029
21:54:00	0.000	0.000	0.000	0.000	0.029	0.029
22:00:00	0.000	0.000	0.000	0.000	0.029	0.029
22:06:00	0.000	0.000	0.000	0.000	0.029	0.029
22:12:00	0.000	0.000	0.000	0.000	0.029	0.029
22:18:00	0.000	0.000	0.000	0.000	0.028	0.028
22:24:00	0.000	0.000	0.000	0.000	0.028	0.028
22:30:00	0.000	0.000	0.000	0.000	0.028	0.028
22:36:00	0.000	0.000	0.000	0.000	0.028	0.028
22:42:00	0.000	0.000	0.000	0.000	0.028	0.028
22:48:00	0.000	0.000	0.000	0.000	0.028	0.028
22:54:00	0.000	0.000	0.000	0.000	0.027	0.027
23:00:00	0.000	0.000	0.000	0.000	0.027	0.027
23:06:00	0.000	0.000	0.000	0.000	0.027	0.027
23:12:00	0.000	0.000	0.000	0.000	0.027	0.027
23:18:00	0.000	0.000	0.000	0.000	0.027	0.027
23:24:00	0.000	0.000	0.000	0.000	0.027	0.027
23:30:00	0.000	0.000	0.000	0.000	0.027	0.027
23:36:00	0.000	0.000	0.000	0.000	0.026	0.026
23:42:00	0.000	0.000	0.000	0.000	0.026	0.026
23:48:00	0.000	0.000	0.000	0.000	0.026	0.026
23:54:00	0.000	0.000	0.000	0.000	0.026	0.026
24:00:00	0.000	0.000	0.000	0.000	0.026	0.026
24:06:00	0.000	0.000	0.000	0.000	0.026	0.026
24:12:00	0.000	0.000	0.000	0.000	0.026	0.026
24:18:00	0.000	0.000	0.000	0.000	0.025	0.025

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.025	0.025
24:30:00	0.000	0.000	0.000	0.000	0.025	0.025
24:36:00	0.000	0.000	0.000	0.000	0.025	0.025
24:42:00	0.000	0.000	0.000	0.000	0.025	0.025
24:48:00	0.000	0.000	0.000	0.000	0.025	0.025
24:54:00	0.000	0.000	0.000	0.000	0.025	0.025
25:00:00	0.000	0.000	0.000	0.000	0.024	0.024
25:06:00	0.000	0.000	0.000	0.000	0.024	0.024
25:12:00	0.000	0.000	0.000	0.000	0.024	0.024
25:18:00	0.000	0.000	0.000	0.000	0.024	0.024
25:24:00	0.000	0.000	0.000	0.000	0.024	0.024
25:30:00	0.000	0.000	0.000	0.000	0.024	0.024
25:36:00	0.000	0.000	0.000	0.000	0.024	0.024
25:42:00	0.000	0.000	0.000	0.000	0.024	0.024
25:48:00	0.000	0.000	0.000	0.000	0.023	0.023
25:54:00	0.000	0.000	0.000	0.000	0.023	0.023
26:00:00	0.000	0.000	0.000	0.000	0.023	0.023
26:06:00	0.000	0.000	0.000	0.000	0.023	0.023
26:12:00	0.000	0.000	0.000	0.000	0.023	0.023
26:18:00	0.000	0.000	0.000	0.000	0.023	0.023
26:24:00	0.000	0.000	0.000	0.000	0.023	0.023
26:30:00	0.000	0.000	0.000	0.000	0.023	0.023
26:36:00	0.000	0.000	0.000	0.000	0.022	0.022
26:42:00	0.000	0.000	0.000	0.000	0.022	0.022
26:48:00	0.000	0.000	0.000	0.000	0.022	0.022
26:54:00	0.000	0.000	0.000	0.000	0.022	0.022
27:00:00	0.000	0.000	0.000	0.000	0.022	0.022
27:06:00	0.000	0.000	0.000	0.000	0.022	0.022
27:12:00	0.000	0.000	0.000	0.000	0.022	0.022
27:18:00	0.000	0.000	0.000	0.000	0.022	0.022
27:24:00	0.000	0.000	0.000	0.000	0.022	0.022
27:30:00	0.000	0.000	0.000	0.000	0.021	0.021
27:36:00	0.000	0.000	0.000	0.000	0.021	0.021
27:42:00	0.000	0.000	0.000	0.000	0.021	0.021
27:48:00	0.000	0.000	0.000	0.000	0.021	0.021

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.021	0.021
28:00:00	0.000	0.000	0.000	0.000	0.021	0.021
28:06:00	0.000	0.000	0.000	0.000	0.021	0.021
28:12:00	0.000	0.000	0.000	0.000	0.021	0.021
28:18:00	0.000	0.000	0.000	0.000	0.020	0.020
28:24:00	0.000	0.000	0.000	0.000	0.020	0.020
28:30:00	0.000	0.000	0.000	0.000	0.020	0.020
28:36:00	0.000	0.000	0.000	0.000	0.020	0.020
28:42:00	0.000	0.000	0.000	0.000	0.020	0.020
28:48:00	0.000	0.000	0.000	0.000	0.020	0.020

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.23 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

OB3 Nant Gyrawd Catchment

DOCUMENT VERIFICATION RECORD	
Project:	Ffos Y Fran – OB3 Nant Gyrawd
Client:	Merthyr (South Wales) Ltd
Report Title:	15840 – Hydrology Assessment - 01
Date:	19/03/2026

DOCUMENT REVIEW & APPROVAL	
Author:	Aled Williams BSc (Hons) MCIWEM C.WEM
Checker:	Jessica Joy BSc (Hons) MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

ReFH2 RUNOFF RATES – OB3 Nant Gyrawd*	
Return Period (Years)	As-rural Peak Flow (l/s)
1	204.8655
2	235.4954
5	333.2109
10	400.3881
30	505.6932
50	555.8804
75	596.9423
100	626.8007
100 + 40% CC	922.1852
200	701.3533
1000	906.9385

*Runoff Rates printed from the ReFH Flood Modelling software package and have been calculated based on a total area of 15.87ha.

UK Design Flood Estimation

Generated on 19 March 2026 12:46:57 by aled.williams
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details

Checksum: A75E-F9F2

Site name: FEH_Catchment_Descriptors_308000_206250_v5_1_0

Easting: 308000

Northing: 206250

Country: England, Wales or Northern Ireland

Catchment Area (km²): 0.16 [0.68]*

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 100 year 1.4 CC

Summary of results

Rainfall - FEH22 (mm):	78.11	Total runoff (ML):	6.87
Total Rainfall (mm):	61.84	Total flow (ML):	9.81
Peak Rainfall (mm):	6.47	Peak flow (m ³ /s):	0.92

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.

** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	02:30:00	No
Timestep (hh:mm:ss)	00:06:00	No
SCF (Seasonal correction factor)	0.8	No
ARF (Areal reduction factor)	0.99	No
Seasonality	Winter	No
Climate change factor	1.40	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	124.55	No
Cmax (mm)	222.11	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	1	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	18.46	No
BR	0.43	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0	No
Effective URBEXT2000	0	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
00:00:00	0.512	0.000	0.288	0.000	0.014	0.014
00:06:00	0.643	0.000	0.363	0.000	0.013	0.014
00:12:00	0.808	0.000	0.459	0.002	0.013	0.015
00:18:00	1.013	0.000	0.579	0.004	0.013	0.018
00:24:00	1.269	0.000	0.732	0.008	0.013	0.022
00:30:00	1.588	0.000	0.927	0.014	0.013	0.027
00:36:00	1.985	0.000	1.174	0.022	0.013	0.036
00:42:00	2.477	0.000	1.490	0.034	0.013	0.047
00:48:00	3.083	0.000	1.893	0.049	0.013	0.062
00:54:00	3.825	0.000	2.409	0.069	0.013	0.082
01:00:00	4.722	0.000	3.064	0.095	0.013	0.108
01:06:00	5.762	0.000	3.875	0.128	0.014	0.142
01:12:00	6.469	0.000	4.528	0.170	0.014	0.184
01:18:00	5.762	0.000	4.192	0.222	0.014	0.236
01:24:00	4.722	0.000	3.547	0.284	0.015	0.299
01:30:00	3.825	0.000	2.947	0.354	0.015	0.369
01:36:00	3.083	0.000	2.423	0.430	0.016	0.446
01:42:00	2.477	0.000	1.978	0.508	0.017	0.526
01:48:00	1.985	0.000	1.605	0.587	0.018	0.606
01:54:00	1.588	0.000	1.297	0.664	0.020	0.683
02:00:00	1.269	0.000	1.044	0.734	0.021	0.756
02:06:00	1.013	0.000	0.839	0.796	0.023	0.819
02:12:00	0.808	0.000	0.672	0.845	0.025	0.870
02:18:00	0.643	0.000	0.537	0.878	0.027	0.904
02:24:00	0.512	0.000	0.429	0.893	0.028	0.921
02:30:00	0.000	0.000	0.000	0.892	0.030	0.922
02:36:00	0.000	0.000	0.000	0.878	0.032	0.910
02:42:00	0.000	0.000	0.000	0.853	0.034	0.887
02:48:00	0.000	0.000	0.000	0.819	0.036	0.854
02:54:00	0.000	0.000	0.000	0.778	0.037	0.815
03:00:00	0.000	0.000	0.000	0.733	0.039	0.772
03:06:00	0.000	0.000	0.000	0.685	0.040	0.725
03:12:00	0.000	0.000	0.000	0.636	0.042	0.678
03:18:00	0.000	0.000	0.000	0.587	0.043	0.630

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	0.000	0.000	0.000	0.540	0.044	0.584
03:30:00	0.000	0.000	0.000	0.495	0.045	0.539
03:36:00	0.000	0.000	0.000	0.451	0.046	0.497
03:42:00	0.000	0.000	0.000	0.410	0.047	0.456
03:48:00	0.000	0.000	0.000	0.371	0.047	0.418
03:54:00	0.000	0.000	0.000	0.334	0.048	0.382
04:00:00	0.000	0.000	0.000	0.299	0.048	0.347
04:06:00	0.000	0.000	0.000	0.266	0.049	0.314
04:12:00	0.000	0.000	0.000	0.234	0.049	0.283
04:18:00	0.000	0.000	0.000	0.203	0.049	0.252
04:24:00	0.000	0.000	0.000	0.174	0.049	0.224
04:30:00	0.000	0.000	0.000	0.147	0.049	0.196
04:36:00	0.000	0.000	0.000	0.122	0.050	0.171
04:42:00	0.000	0.000	0.000	0.098	0.050	0.148
04:48:00	0.000	0.000	0.000	0.078	0.049	0.127
04:54:00	0.000	0.000	0.000	0.060	0.049	0.109
05:00:00	0.000	0.000	0.000	0.046	0.049	0.095
05:06:00	0.000	0.000	0.000	0.034	0.049	0.083
05:12:00	0.000	0.000	0.000	0.025	0.049	0.074
05:18:00	0.000	0.000	0.000	0.018	0.049	0.067
05:24:00	0.000	0.000	0.000	0.013	0.048	0.061
05:30:00	0.000	0.000	0.000	0.008	0.048	0.057
05:36:00	0.000	0.000	0.000	0.005	0.048	0.053
05:42:00	0.000	0.000	0.000	0.003	0.048	0.051
05:48:00	0.000	0.000	0.000	0.002	0.047	0.049
05:54:00	0.000	0.000	0.000	0.001	0.047	0.048
06:00:00	0.000	0.000	0.000	0.000	0.047	0.047
06:06:00	0.000	0.000	0.000	0.000	0.047	0.047
06:12:00	0.000	0.000	0.000	0.000	0.046	0.046
06:18:00	0.000	0.000	0.000	0.000	0.046	0.046
06:24:00	0.000	0.000	0.000	0.000	0.046	0.046
06:30:00	0.000	0.000	0.000	0.000	0.046	0.046
06:36:00	0.000	0.000	0.000	0.000	0.045	0.045
06:42:00	0.000	0.000	0.000	0.000	0.045	0.045
06:48:00	0.000	0.000	0.000	0.000	0.045	0.045

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.000	0.045	0.045
07:00:00	0.000	0.000	0.000	0.000	0.044	0.044
07:06:00	0.000	0.000	0.000	0.000	0.044	0.044
07:12:00	0.000	0.000	0.000	0.000	0.044	0.044
07:18:00	0.000	0.000	0.000	0.000	0.044	0.044
07:24:00	0.000	0.000	0.000	0.000	0.043	0.043
07:30:00	0.000	0.000	0.000	0.000	0.043	0.043
07:36:00	0.000	0.000	0.000	0.000	0.043	0.043
07:42:00	0.000	0.000	0.000	0.000	0.043	0.043
07:48:00	0.000	0.000	0.000	0.000	0.043	0.043
07:54:00	0.000	0.000	0.000	0.000	0.042	0.042
08:00:00	0.000	0.000	0.000	0.000	0.042	0.042
08:06:00	0.000	0.000	0.000	0.000	0.042	0.042
08:12:00	0.000	0.000	0.000	0.000	0.042	0.042
08:18:00	0.000	0.000	0.000	0.000	0.041	0.041
08:24:00	0.000	0.000	0.000	0.000	0.041	0.041
08:30:00	0.000	0.000	0.000	0.000	0.041	0.041
08:36:00	0.000	0.000	0.000	0.000	0.041	0.041
08:42:00	0.000	0.000	0.000	0.000	0.041	0.041
08:48:00	0.000	0.000	0.000	0.000	0.040	0.040
08:54:00	0.000	0.000	0.000	0.000	0.040	0.040
09:00:00	0.000	0.000	0.000	0.000	0.040	0.040
09:06:00	0.000	0.000	0.000	0.000	0.040	0.040
09:12:00	0.000	0.000	0.000	0.000	0.039	0.039
09:18:00	0.000	0.000	0.000	0.000	0.039	0.039
09:24:00	0.000	0.000	0.000	0.000	0.039	0.039
09:30:00	0.000	0.000	0.000	0.000	0.039	0.039
09:36:00	0.000	0.000	0.000	0.000	0.039	0.039
09:42:00	0.000	0.000	0.000	0.000	0.038	0.038
09:48:00	0.000	0.000	0.000	0.000	0.038	0.038
09:54:00	0.000	0.000	0.000	0.000	0.038	0.038
10:00:00	0.000	0.000	0.000	0.000	0.038	0.038
10:06:00	0.000	0.000	0.000	0.000	0.038	0.038
10:12:00	0.000	0.000	0.000	0.000	0.037	0.037
10:18:00	0.000	0.000	0.000	0.000	0.037	0.037

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.000	0.037	0.037
10:30:00	0.000	0.000	0.000	0.000	0.037	0.037
10:36:00	0.000	0.000	0.000	0.000	0.037	0.037
10:42:00	0.000	0.000	0.000	0.000	0.036	0.036
10:48:00	0.000	0.000	0.000	0.000	0.036	0.036
10:54:00	0.000	0.000	0.000	0.000	0.036	0.036
11:00:00	0.000	0.000	0.000	0.000	0.036	0.036
11:06:00	0.000	0.000	0.000	0.000	0.036	0.036
11:12:00	0.000	0.000	0.000	0.000	0.035	0.035
11:18:00	0.000	0.000	0.000	0.000	0.035	0.035
11:24:00	0.000	0.000	0.000	0.000	0.035	0.035
11:30:00	0.000	0.000	0.000	0.000	0.035	0.035
11:36:00	0.000	0.000	0.000	0.000	0.035	0.035
11:42:00	0.000	0.000	0.000	0.000	0.034	0.034
11:48:00	0.000	0.000	0.000	0.000	0.034	0.034
11:54:00	0.000	0.000	0.000	0.000	0.034	0.034
12:00:00	0.000	0.000	0.000	0.000	0.034	0.034
12:06:00	0.000	0.000	0.000	0.000	0.034	0.034
12:12:00	0.000	0.000	0.000	0.000	0.034	0.034
12:18:00	0.000	0.000	0.000	0.000	0.033	0.033
12:24:00	0.000	0.000	0.000	0.000	0.033	0.033
12:30:00	0.000	0.000	0.000	0.000	0.033	0.033
12:36:00	0.000	0.000	0.000	0.000	0.033	0.033
12:42:00	0.000	0.000	0.000	0.000	0.033	0.033
12:48:00	0.000	0.000	0.000	0.000	0.032	0.032
12:54:00	0.000	0.000	0.000	0.000	0.032	0.032
13:00:00	0.000	0.000	0.000	0.000	0.032	0.032
13:06:00	0.000	0.000	0.000	0.000	0.032	0.032
13:12:00	0.000	0.000	0.000	0.000	0.032	0.032
13:18:00	0.000	0.000	0.000	0.000	0.032	0.032
13:24:00	0.000	0.000	0.000	0.000	0.031	0.031
13:30:00	0.000	0.000	0.000	0.000	0.031	0.031
13:36:00	0.000	0.000	0.000	0.000	0.031	0.031
13:42:00	0.000	0.000	0.000	0.000	0.031	0.031
13:48:00	0.000	0.000	0.000	0.000	0.031	0.031

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.000	0.031	0.031
14:00:00	0.000	0.000	0.000	0.000	0.030	0.030
14:06:00	0.000	0.000	0.000	0.000	0.030	0.030
14:12:00	0.000	0.000	0.000	0.000	0.030	0.030
14:18:00	0.000	0.000	0.000	0.000	0.030	0.030
14:24:00	0.000	0.000	0.000	0.000	0.030	0.030
14:30:00	0.000	0.000	0.000	0.000	0.030	0.030
14:36:00	0.000	0.000	0.000	0.000	0.029	0.029
14:42:00	0.000	0.000	0.000	0.000	0.029	0.029
14:48:00	0.000	0.000	0.000	0.000	0.029	0.029
14:54:00	0.000	0.000	0.000	0.000	0.029	0.029
15:00:00	0.000	0.000	0.000	0.000	0.029	0.029
15:06:00	0.000	0.000	0.000	0.000	0.029	0.029
15:12:00	0.000	0.000	0.000	0.000	0.028	0.028
15:18:00	0.000	0.000	0.000	0.000	0.028	0.028
15:24:00	0.000	0.000	0.000	0.000	0.028	0.028
15:30:00	0.000	0.000	0.000	0.000	0.028	0.028
15:36:00	0.000	0.000	0.000	0.000	0.028	0.028
15:42:00	0.000	0.000	0.000	0.000	0.028	0.028
15:48:00	0.000	0.000	0.000	0.000	0.028	0.028
15:54:00	0.000	0.000	0.000	0.000	0.027	0.027
16:00:00	0.000	0.000	0.000	0.000	0.027	0.027
16:06:00	0.000	0.000	0.000	0.000	0.027	0.027
16:12:00	0.000	0.000	0.000	0.000	0.027	0.027
16:18:00	0.000	0.000	0.000	0.000	0.027	0.027
16:24:00	0.000	0.000	0.000	0.000	0.027	0.027
16:30:00	0.000	0.000	0.000	0.000	0.027	0.027
16:36:00	0.000	0.000	0.000	0.000	0.026	0.026
16:42:00	0.000	0.000	0.000	0.000	0.026	0.026
16:48:00	0.000	0.000	0.000	0.000	0.026	0.026
16:54:00	0.000	0.000	0.000	0.000	0.026	0.026
17:00:00	0.000	0.000	0.000	0.000	0.026	0.026
17:06:00	0.000	0.000	0.000	0.000	0.026	0.026
17:12:00	0.000	0.000	0.000	0.000	0.026	0.026
17:18:00	0.000	0.000	0.000	0.000	0.025	0.025

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.000	0.025	0.025
17:30:00	0.000	0.000	0.000	0.000	0.025	0.025
17:36:00	0.000	0.000	0.000	0.000	0.025	0.025
17:42:00	0.000	0.000	0.000	0.000	0.025	0.025
17:48:00	0.000	0.000	0.000	0.000	0.025	0.025
17:54:00	0.000	0.000	0.000	0.000	0.025	0.025
18:00:00	0.000	0.000	0.000	0.000	0.024	0.024
18:06:00	0.000	0.000	0.000	0.000	0.024	0.024
18:12:00	0.000	0.000	0.000	0.000	0.024	0.024
18:18:00	0.000	0.000	0.000	0.000	0.024	0.024
18:24:00	0.000	0.000	0.000	0.000	0.024	0.024
18:30:00	0.000	0.000	0.000	0.000	0.024	0.024
18:36:00	0.000	0.000	0.000	0.000	0.024	0.024
18:42:00	0.000	0.000	0.000	0.000	0.024	0.024
18:48:00	0.000	0.000	0.000	0.000	0.023	0.023
18:54:00	0.000	0.000	0.000	0.000	0.023	0.023
19:00:00	0.000	0.000	0.000	0.000	0.023	0.023
19:06:00	0.000	0.000	0.000	0.000	0.023	0.023
19:12:00	0.000	0.000	0.000	0.000	0.023	0.023
19:18:00	0.000	0.000	0.000	0.000	0.023	0.023
19:24:00	0.000	0.000	0.000	0.000	0.023	0.023
19:30:00	0.000	0.000	0.000	0.000	0.023	0.023
19:36:00	0.000	0.000	0.000	0.000	0.022	0.022
19:42:00	0.000	0.000	0.000	0.000	0.022	0.022
19:48:00	0.000	0.000	0.000	0.000	0.022	0.022
19:54:00	0.000	0.000	0.000	0.000	0.022	0.022
20:00:00	0.000	0.000	0.000	0.000	0.022	0.022
20:06:00	0.000	0.000	0.000	0.000	0.022	0.022
20:12:00	0.000	0.000	0.000	0.000	0.022	0.022
20:18:00	0.000	0.000	0.000	0.000	0.022	0.022
20:24:00	0.000	0.000	0.000	0.000	0.021	0.021
20:30:00	0.000	0.000	0.000	0.000	0.021	0.021
20:36:00	0.000	0.000	0.000	0.000	0.021	0.021
20:42:00	0.000	0.000	0.000	0.000	0.021	0.021
20:48:00	0.000	0.000	0.000	0.000	0.021	0.021

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.021	0.021
21:00:00	0.000	0.000	0.000	0.000	0.021	0.021
21:06:00	0.000	0.000	0.000	0.000	0.021	0.021
21:12:00	0.000	0.000	0.000	0.000	0.021	0.021
21:18:00	0.000	0.000	0.000	0.000	0.020	0.020
21:24:00	0.000	0.000	0.000	0.000	0.020	0.020
21:30:00	0.000	0.000	0.000	0.000	0.020	0.020
21:36:00	0.000	0.000	0.000	0.000	0.020	0.020
21:42:00	0.000	0.000	0.000	0.000	0.020	0.020
21:48:00	0.000	0.000	0.000	0.000	0.020	0.020
21:54:00	0.000	0.000	0.000	0.000	0.020	0.020
22:00:00	0.000	0.000	0.000	0.000	0.020	0.020
22:06:00	0.000	0.000	0.000	0.000	0.020	0.020
22:12:00	0.000	0.000	0.000	0.000	0.020	0.020
22:18:00	0.000	0.000	0.000	0.000	0.019	0.019
22:24:00	0.000	0.000	0.000	0.000	0.019	0.019
22:30:00	0.000	0.000	0.000	0.000	0.019	0.019
22:36:00	0.000	0.000	0.000	0.000	0.019	0.019
22:42:00	0.000	0.000	0.000	0.000	0.019	0.019
22:48:00	0.000	0.000	0.000	0.000	0.019	0.019
22:54:00	0.000	0.000	0.000	0.000	0.019	0.019
23:00:00	0.000	0.000	0.000	0.000	0.019	0.019
23:06:00	0.000	0.000	0.000	0.000	0.019	0.019
23:12:00	0.000	0.000	0.000	0.000	0.018	0.018
23:18:00	0.000	0.000	0.000	0.000	0.018	0.018
23:24:00	0.000	0.000	0.000	0.000	0.018	0.018
23:30:00	0.000	0.000	0.000	0.000	0.018	0.018
23:36:00	0.000	0.000	0.000	0.000	0.018	0.018
23:42:00	0.000	0.000	0.000	0.000	0.018	0.018
23:48:00	0.000	0.000	0.000	0.000	0.018	0.018
23:54:00	0.000	0.000	0.000	0.000	0.018	0.018
24:00:00	0.000	0.000	0.000	0.000	0.018	0.018
24:06:00	0.000	0.000	0.000	0.000	0.018	0.018
24:12:00	0.000	0.000	0.000	0.000	0.017	0.017
24:18:00	0.000	0.000	0.000	0.000	0.017	0.017

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.017	0.017
24:30:00	0.000	0.000	0.000	0.000	0.017	0.017
24:36:00	0.000	0.000	0.000	0.000	0.017	0.017
24:42:00	0.000	0.000	0.000	0.000	0.017	0.017
24:48:00	0.000	0.000	0.000	0.000	0.017	0.017
24:54:00	0.000	0.000	0.000	0.000	0.017	0.017
25:00:00	0.000	0.000	0.000	0.000	0.017	0.017
25:06:00	0.000	0.000	0.000	0.000	0.017	0.017
25:12:00	0.000	0.000	0.000	0.000	0.017	0.017
25:18:00	0.000	0.000	0.000	0.000	0.016	0.016
25:24:00	0.000	0.000	0.000	0.000	0.016	0.016
25:30:00	0.000	0.000	0.000	0.000	0.016	0.016
25:36:00	0.000	0.000	0.000	0.000	0.016	0.016
25:42:00	0.000	0.000	0.000	0.000	0.016	0.016
25:48:00	0.000	0.000	0.000	0.000	0.016	0.016
25:54:00	0.000	0.000	0.000	0.000	0.016	0.016
26:00:00	0.000	0.000	0.000	0.000	0.016	0.016
26:06:00	0.000	0.000	0.000	0.000	0.016	0.016
26:12:00	0.000	0.000	0.000	0.000	0.016	0.016
26:18:00	0.000	0.000	0.000	0.000	0.016	0.016
26:24:00	0.000	0.000	0.000	0.000	0.016	0.016
26:30:00	0.000	0.000	0.000	0.000	0.015	0.015
26:36:00	0.000	0.000	0.000	0.000	0.015	0.015
26:42:00	0.000	0.000	0.000	0.000	0.015	0.015
26:48:00	0.000	0.000	0.000	0.000	0.015	0.015
26:54:00	0.000	0.000	0.000	0.000	0.015	0.015
27:00:00	0.000	0.000	0.000	0.000	0.015	0.015
27:06:00	0.000	0.000	0.000	0.000	0.015	0.015
27:12:00	0.000	0.000	0.000	0.000	0.015	0.015
27:18:00	0.000	0.000	0.000	0.000	0.015	0.015
27:24:00	0.000	0.000	0.000	0.000	0.015	0.015
27:30:00	0.000	0.000	0.000	0.000	0.015	0.015
27:36:00	0.000	0.000	0.000	0.000	0.015	0.015
27:42:00	0.000	0.000	0.000	0.000	0.014	0.014
27:48:00	0.000	0.000	0.000	0.000	0.014	0.014

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.014	0.014
28:00:00	0.000	0.000	0.000	0.000	0.014	0.014
28:06:00	0.000	0.000	0.000	0.000	0.014	0.014
28:12:00	0.000	0.000	0.000	0.000	0.014	0.014
28:18:00	0.000	0.000	0.000	0.000	0.014	0.014
28:24:00	0.000	0.000	0.000	0.000	0.014	0.014
28:30:00	0.000	0.000	0.000	0.000	0.014	0.014
28:36:00	0.000	0.000	0.000	0.000	0.014	0.014
28:42:00	0.000	0.000	0.000	0.000	0.014	0.014
28:48:00	0.000	0.000	0.000	0.000	0.014	0.014

Appendix

Catchment descriptors *

Name	Value	User-defined value used?
Area (km ²)	0.16 [0.68]	Yes
ALTBAR	400	No
ASPBAR	176	No
ASPVAR	0.62	No
BFIHOST	0.29	No
BFIHOST19	0.3	No
DPLBAR (km)	0.7	No
DPSBAR (mkm ⁻¹)	58.5	No
FARL	0.79	No
LDP	1.51	No
PROPWET	0.54	No
RMED1H	11.4	No
RMED1D	51.1	No
RMED2D	67.6	No
SAAR (mm)	1493	No
SAAR4170 (mm)	1552	No
SPRHOST	49.86	No
URBEXT2000	0	No
URBEXT1990	0	No
URBCONC	0	No
URBLOC	0	No
DDF parameter C	-0.03	No
DDF parameter D1	0.46	No
DDF parameter D2	0.44	No
DDF parameter D3	0.38	No
DDF parameter E	0.29	No
DDF parameter F	2.51	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.45	No
DDF parameter D2 (1km grid value)	0.43	No
DDF parameter D3 (1km grid value)	0.38	No
DDF parameter E (1km grid value)	0.29	No
DDF parameter F (1km grid value)	2.51	No

Values in square brackets are the original values loaded from the FEH Web Service or FEH CD-ROM

Appendix E Culvert Capacity Calculations

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: BOAT Culvert 1		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
(Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	600.00
Hyd. Gradient (1 in ...)	10.14
Coeff Ks (mm)	0.060

Output details:

Full bore Velocity (m/s)	9.702
Full bore Discharge (L/s)	2743.224

Pipe losses (m)

0.5 V2 / 2g	2.399
V2 / 2g	4.798
1.5 V2 / 2g	7.197

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: OB1 Northern		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
(Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	600.00
Hyd. Gradient (1 in ...)	9.40
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	9.274
Full bore Discharge (L/s)	2622.222

Pipe losses (m)

0.5 V2 / 2g	2.192
V2 / 2g	4.384
1.5 V2 / 2g	6.576

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: Bargoed Taff 600mm		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
(Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	600.00
Hyd. Gradient (1 in ...)	15.84
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	7.131
Full bore Discharge (L/s)	2016.306

Pipe losses (m)

0.5 V2 / 2g	1.296
V2 / 2g	2.592
1.5 V2 / 2g	3.888

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: Bargoed Taff 900mm		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
 (Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	900.00
Hyd. Gradient (1 in ...)	13.56
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	9.860
Full bore Discharge (L/s)	6272.727

Pipe losses (m)

0.5 V2 / 2g	2.478
V2 / 2g	4.955
1.5 V2 / 2g	7.433

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: OB2 Nant Gyrawd		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
 (Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	550.00
Hyd. Gradient (1 in ...)	17.68
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	6.398
Full bore Discharge (L/s)	1520.113

Pipe losses (m)

0.5 V2 / 2g	1.043
V2 / 2g	2.087
1.5 V2 / 2g	3.130

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: Nant Cwmlacs		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
(Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	1200.00
Hyd. Gradient (1 in ...)	5.66
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	18.178
Full bore Discharge (L/s)	20559.311

Pipe losses (m)

0.5 V2 / 2g	8.421
V2 / 2g	16.843
1.5 V2 / 2g	25.264

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculation	ref: 15840
			prefix: A
Scheme: Ffos Y Fran		page no: 1	
Section: OB3 Bargoed Taff		dated: 19/03/26	

Calculation based on Colebrook White equation for water at 15° C.
(Kinematic viscosity $1.141 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$)

Option 1 - Full bore Velocity / Discharge

Input data:

Diameter (mm)	600.00
Hyd. Gradient (1 in ...)	18.96
Coeff Ks (mm)	0.150

Output details:

Full bore Velocity (m/s)	6.513
Full bore Discharge (L/s)	1841.582

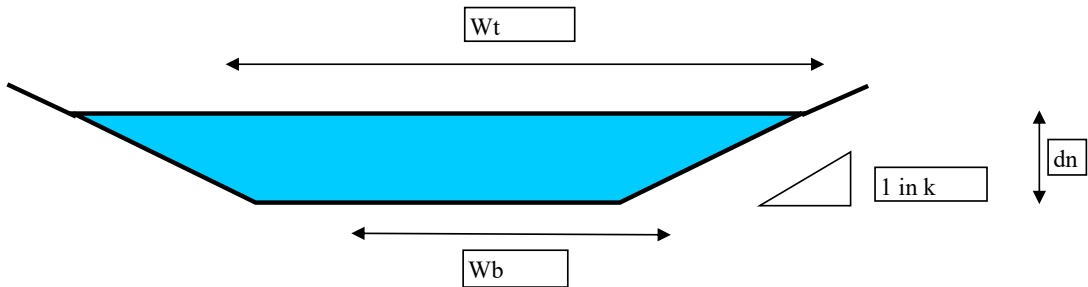
Pipe losses (m)

0.5 V ² / 2g	1.081
V ² / 2g	2.162
1.5 V ² / 2g	3.243

Appendix F Watercourse Capacity Calculations

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	OB1 Northern Catchment	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge

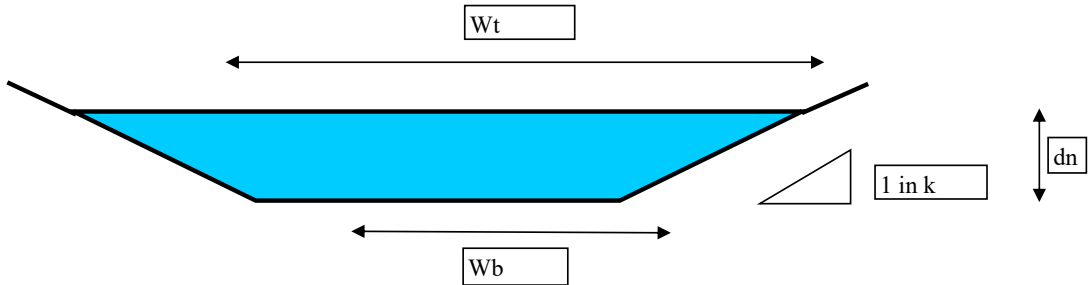


Manning Formula $V = (1/n) * R^{(2/3)} * S^{(1/2)}$ $Q = A * V$

Bottom width Wb (m)	1.000	
Side slope (1 in k)	0.000	
Bed slope (1 in x)	20.00	
Manning "n"	0.016	
Depth dn (m)	0.500	
Bed slope s (m/m)	0.050000	1 / x
Top width Wt (m)	1.000	$Wb + 2 * k * dn$
Area A (m ²)	0.500	$(Wb + Wt) / 2 * dn$
Perim P (m)	2.000	$Wb + 2 * dn * \text{SQRT}(1 + k^2)$
Hyd Rad R (m)	0.250	A / P
Velocity V (m/s)	5.546	$1/n * R^{(2/3)} * S^{(1/2)}$
Discharge Q (m ³ /s)	2.7731	A * V

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	Bargoed Taff North East	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge

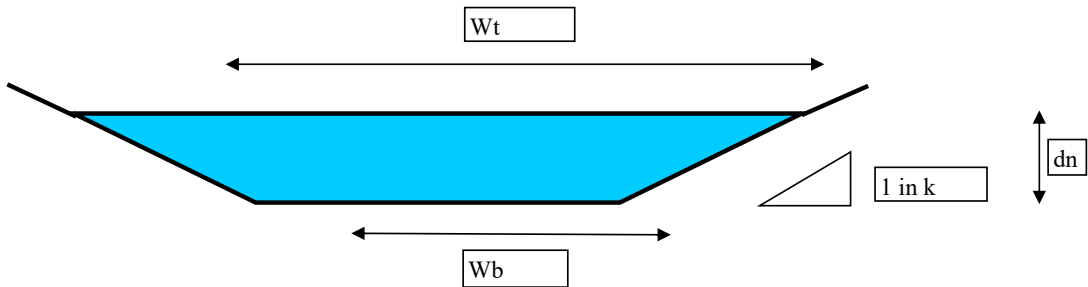


Manning Formula $V = \frac{1}{n} R^{2/3} S^{1/2}$ $Q = A \cdot V$

Bottom width Wb (m)	1.000	
Side slope (1 in k)	0.000	
Bed slope (1 in x)	20.00	
Manning "n"	0.016	
Depth dn (m)	0.500	
Bed slope s (m/m)	0.050000	1 / x
Top width Wt (m)	1.000	$Wb + 2 \cdot k \cdot dn$
Area A (m ²)	0.500	$(Wb + Wt) / 2 \cdot dn$
Perim P (m)	2.000	$Wb + 2 \cdot dn \cdot \sqrt{1 + k^2}$
Hyd Rad R (m)	0.250	A / P
Velocity V (m/s)	5.546	$\frac{1}{n} \cdot R^{2/3} \cdot S^{1/2}$
Discharge Q (m ³ /s)	2.7731	A · V

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	Bargoed Taff	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge

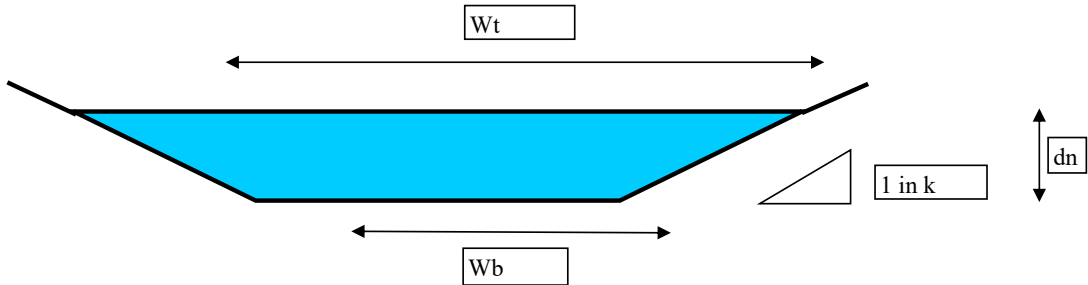


Manning Formula $V = (1/n) * R^{(2/3)} * S^{(1/2)}$ $Q = A * V$

Bottom width Wb (m)	2.300	
Side slope (1 in k)	1.530	
Bed slope (1 in x)	8.62	
Manning "n"	0.016	
Depth dn (m)	0.500	
Bed slope s (m/m)	0.116009	1 / x
Top width Wt (m)	3.830	$Wb + 2 * k * dn$
Area A (m ²)	1.533	$(Wb + Wt) / 2 * dn$
Perim P (m)	4.128	$Wb + 2 * dn * \text{SQRT}(1 + k^2)$
Hyd Rad R (m)	0.371	A / P
Velocity V (m/s)	10.996	$1/n * R^{(2/3)} * S^{(1/2)}$
Discharge Q (m ³ /s)	16.8518	A * V

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	Bargoed Taff Tributary 1	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge

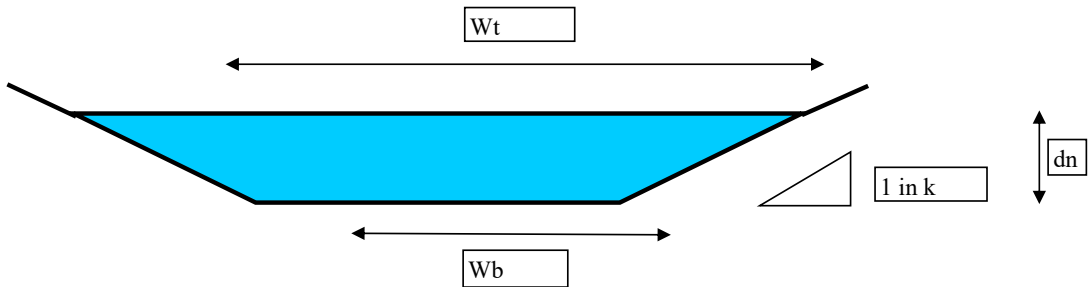


Manning Formula $V = (1/n) * R^{(2/3)} * S^{(1/2)}$ $Q = A * V$

Bottom width Wb (m)	3.900	
Side slope (1 in k)	0.400	
Bed slope (1 in x)	7.59	
Manning "n"	0.035	
Depth dn (m)	0.270	
Bed slope s (m/m)	0.131752	1 / x
Top width Wt (m)	4.116	$Wb + 2 * k * dn$
Area A (m ²)	1.082	$(Wb + Wt) / 2 * dn$
Perim P (m)	4.482	$Wb + 2 * dn * \text{SQRT}(1 + k^2)$
Hyd Rad R (m)	0.241	A / P
Velocity V (m/s)	4.021	$1/n * R^{(2/3)} * S^{(1/2)}$
Discharge Q (m ³ /s)	4.3519	A * V

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	Bargoed Taff Tributary 2	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge

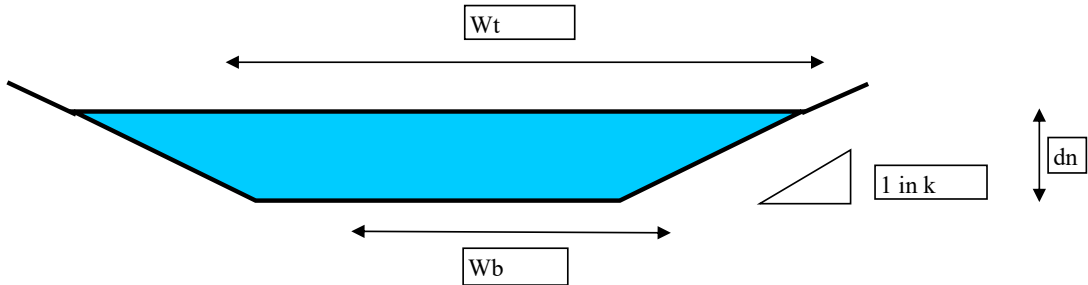


Manning Formula $V = (1/n) * R^{2/3} * S^{1/2}$ $Q = A * V$

Bottom width Wb (m)	1.960	
Side slope (1 in k)	1.465	
Bed slope (1 in x)	8.89	
Manning "n"	0.035	
Depth dn (m)	1.370	
Bed slope s (m/m)	0.112486	1 / x
Top width Wt (m)	5.974	$Wb + 2 * k * dn$
Area A (m ²)	5.435	$(Wb + Wt) / 2 * dn$
Perim P (m)	6.820	$Wb + 2 * dn * \sqrt{1 + k^2}$
Hyd Rad R (m)	0.797	A / P
Velocity V (m/s)	8.237	$1/n * R^{2/3} * S^{1/2}$
Discharge Q (m ³ /s)	44.7645	A * V

	Eden Court, Lon Parcwr, Ruthin, 01824 702220	Calculations	ref	15840
Scheme:	Ffos-y-Fran	Prefix	Page no.	A
Section:	OB3 Nant Gyrawd	Date:	19/03/2026	

Trapezoidal Channel Flow
Output Discharge



Manning Formula $V = (1/n) * R^{(2/3)} * S^{(1/2)}$ $Q = A * V$

Bottom width Wb (m)	1.250	
Side slope (1 in k)	0.940	
Bed slope (1 in x)	10.63	
Manning "n"	0.035	
Depth dn (m)	0.250	
Bed slope s (m/m)	0.094073	1 / x
Top width Wt (m)	1.720	$Wb + 2 * k * dn$
Area A (m ²)	0.371	$(Wb + Wt) / 2 * dn$
Perim P (m)	1.936	$Wb + 2 * dn * \text{SQRT}(1 + k^2)$
Hyd Rad R (m)	0.192	A / P
Velocity V (m/s)	2.914	$1/n * R^{(2/3)} * S^{(1/2)}$
Discharge Q (m ³ /s)	1.0818	A * V

Appendix G Attenuation Storage Estimate

Waterco Ltd				Page 1		
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ		Ffos Y Fran Bargoed Taff North East				
Date 19/03/2026 File		Designed by AW Checked by NJ				
XP Solutions		Source Control 2020.1.3				
Summary of Results for 100 year Return Period (+40%)						
Storm Event		Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer		8.450	0.650	375.1	8092.1	0 K
30 min Summer		8.730	0.930	596.6	11576.9	0 K
60 min Summer		9.060	1.260	736.4	15684.6	0 K
120 min Summer		9.299	1.499	822.7	18654.2	0 K
180 min Summer		9.428	1.628	865.9	20256.4	0 K
240 min Summer		9.513	1.713	893.3	21323.9	0 K
360 min Summer		9.618	1.818	925.9	22627.3	0 K
480 min Summer		9.672	1.872	942.2	23303.3	0 K
600 min Summer		9.696	1.896	949.4	23599.4	0 K
720 min Summer		9.701	1.901	950.7	23659.3	Flood Risk
960 min Summer		9.676	1.876	943.4	23349.1	0 K
1440 min Summer		9.577	1.777	913.3	22117.3	0 K
2160 min Summer		9.411	1.611	860.5	20053.1	0 K
2880 min Summer		9.271	1.471	813.1	18302.5	0 K
4320 min Summer		9.068	1.268	739.4	15786.9	0 K
5760 min Summer		8.933	1.133	685.9	14104.4	0 K
7200 min Summer		8.843	1.043	647.6	12979.8	0 K
8640 min Summer		8.777	0.977	618.4	12163.6	0 K
10080 min Summer		8.729	0.929	596.1	11565.0	0 K
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer		109.897	0.0	7062.0	33	
30 min Summer		80.589	0.0	10863.4	45	
60 min Summer		56.489	0.0	16533.9	72	
120 min Summer		35.820	0.0	21131.3	124	
180 min Summer		27.603	0.0	24517.6	172	
240 min Summer		22.934	0.0	27222.9	202	
360 min Summer		17.556	0.0	31336.4	266	
480 min Summer		14.473	0.0	34489.6	336	
600 min Summer		12.432	0.0	37057.5	404	
720 min Summer		10.964	0.0	39231.4	472	
960 min Summer		8.962	0.0	42758.0	610	
1440 min Summer		6.732	0.0	48089.7	876	
2160 min Summer		5.060	0.0	55231.2	1260	
2880 min Summer		4.153	0.0	60389.6	1632	
4320 min Summer		3.191	0.0	69219.1	2376	
5760 min Summer		2.681	0.0	78454.0	3080	
7200 min Summer		2.372	0.0	86697.3	3824	
8640 min Summer		2.163	0.0	94744.2	4512	
10080 min Summer		2.013	0.0	102497.2	5248	
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Waterco Ltd			Page 2		
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ		Ffos Y Fran Bargoed Taff North East			
Date 19/03/2026 File		Designed by AW Checked by NJ			
XP Solutions		Source Control 2020.1.3			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	8.527	0.727	443.5	9045.1	0 K
30 min Winter	8.843	1.043	647.6	12977.4	0 K
60 min Winter	9.217	1.417	794.1	17631.3	0 K
120 min Winter	9.491	1.691	886.3	21047.0	0 K
180 min Winter	9.642	1.842	933.2	22927.8	0 K
240 min Winter	9.727	1.927	958.6	23989.6	Flood Risk
360 min Winter	9.829	2.029	988.1	25256.1	Flood Risk
480 min Winter	9.869	2.069	999.5	25755.3	Flood Risk
600 min Winter	9.873	2.073	1000.6	25804.4	Flood Risk
720 min Winter	9.856	2.056	995.7	25587.4	Flood Risk
960 min Winter	9.785	1.985	975.5	24710.9	Flood Risk
1440 min Winter	9.606	1.806	922.2	22480.7	0 K
2160 min Winter	9.353	1.553	841.1	19326.4	0 K
2880 min Winter	9.155	1.355	771.7	16860.7	0 K
4320 min Winter	8.891	1.091	668.2	13574.8	0 K
5760 min Winter	8.733	0.933	597.7	11608.3	0 K
7200 min Winter	8.645	0.845	550.0	10515.8	0 K
8640 min Winter	8.596	0.796	506.2	9912.6	0 K
10080 min Winter	8.561	0.761	474.2	9471.0	0 K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Winter	109.897	0.0	8037.4	33	
30 min Winter	80.589	0.0	12305.4	45	
60 min Winter	56.489	0.0	18594.9	72	
120 min Winter	35.820	0.0	23746.3	124	
180 min Winter	27.603	0.0	27540.9	178	
240 min Winter	22.934	0.0	30572.6	222	
360 min Winter	17.556	0.0	35183.0	284	
480 min Winter	14.473	0.0	38717.7	360	
600 min Winter	12.432	0.0	41597.2	436	
720 min Winter	10.964	0.0	44035.2	510	
960 min Winter	8.962	0.0	47992.2	654	
1440 min Winter	6.732	0.0	53980.1	930	
2160 min Winter	5.060	0.0	61916.7	1324	
2880 min Winter	4.153	0.0	67706.7	1704	
4320 min Winter	3.191	0.0	77667.9	2428	
5760 min Winter	2.681	0.0	87909.2	3128	
7200 min Winter	2.372	0.0	97155.1	3816	
8640 min Winter	2.163	0.0	106195.6	4512	
10080 min Winter	2.013	0.0	114964.8	5248	
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Waterco Ltd		Page 3
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	Ffos Y Fran Bargoed Taff North East	
Date 19/03/2026 File	Designed by AW Checked by NJ	
XP Solutions	Source Control 2020.1.3	

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 307214 206844 SO 07214 06844
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

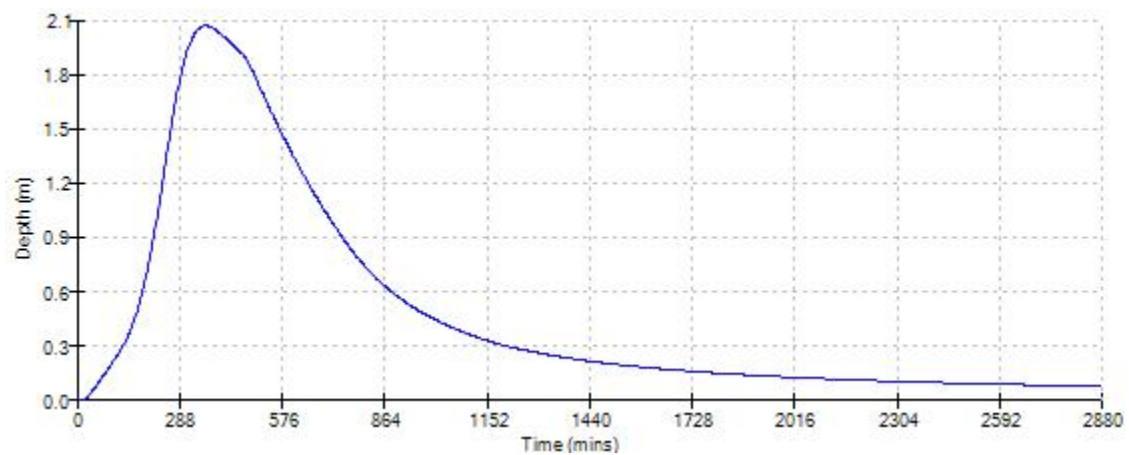
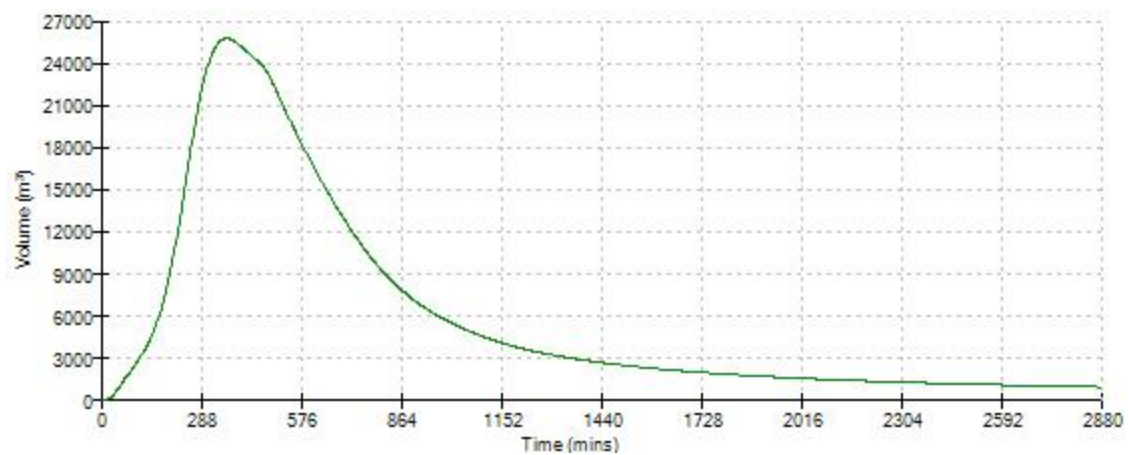
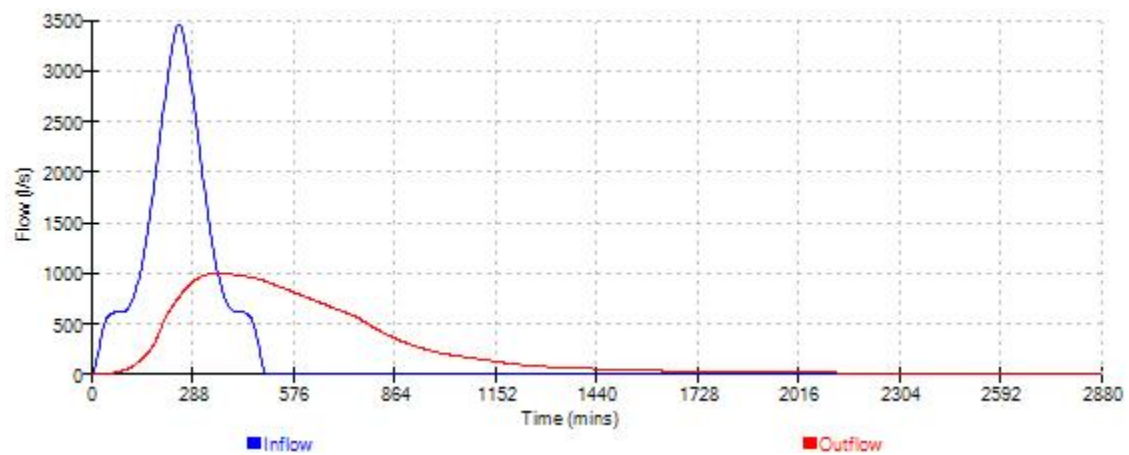
Time Area Diagram

Total Area (ha) 40.800

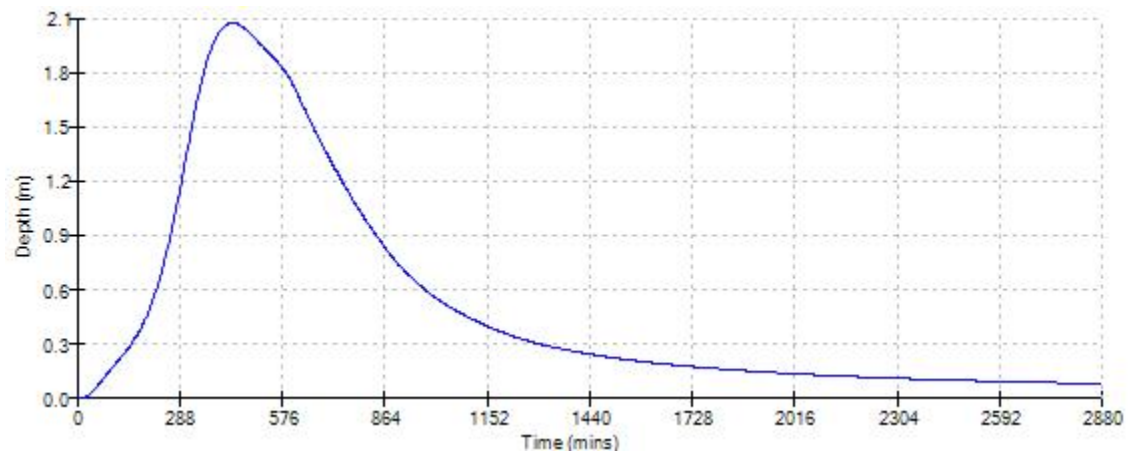
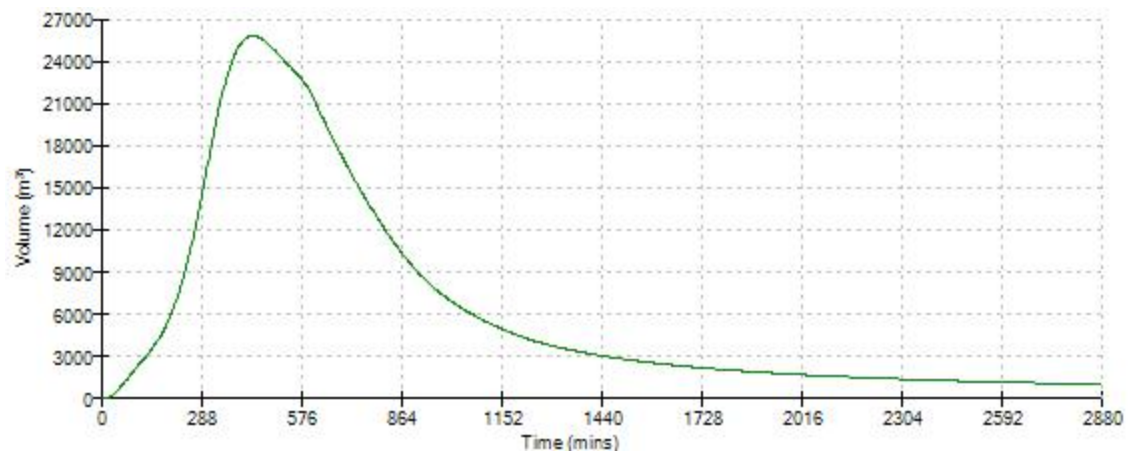
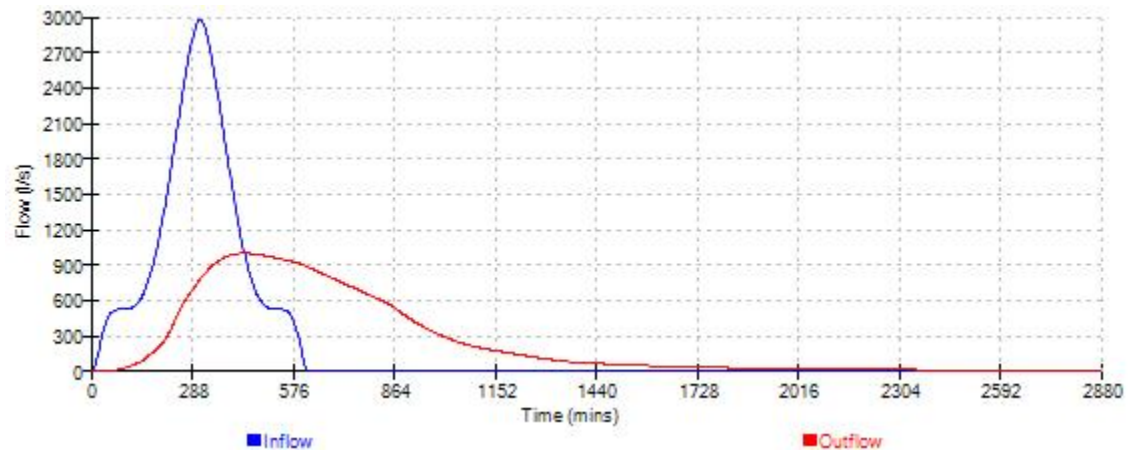
Time (mins) Area			Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	8.160	8	12	8.160	16	20	8.160
4	8	8.160	12	16	8.160			

Waterco Ltd		Page 4																								
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	Ffos Y Fran Bargoed Taff North East																									
Date 19/03/2026 File	Designed by AW Checked by NJ																									
XP SolutionsSource Control 2020.1.3																										
Model Details Storage is Online Cover Level (m) 10.000 Tank or Pond Structure Invert Level (m) 7.800 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>12446.0</td><td>2.200</td><td>12446.0</td></tr></tbody></table> Pipe Outflow Control <table><tbody><tr><td>Diameter (m)</td><td>0.600</td><td>Entry Loss Coefficient</td><td>0.050</td></tr><tr><td>Slope (1:X)</td><td>15.8</td><td>Coefficient of Contraction</td><td>0.600</td></tr><tr><td>Length (m)</td><td>29.000</td><td>Upstream Invert Level (m)</td><td>7.800</td></tr><tr><td>Roughness k (mm)</td><td>0.150</td><td></td><td></td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	12446.0	2.200	12446.0	Diameter (m)	0.600	Entry Loss Coefficient	0.050	Slope (1:X)	15.8	Coefficient of Contraction	0.600	Length (m)	29.000	Upstream Invert Level (m)	7.800	Roughness k (mm)	0.150		
Depth (m)	Area (m²)	Depth (m)	Area (m²)																							
0.000	12446.0	2.200	12446.0																							
Diameter (m)	0.600	Entry Loss Coefficient	0.050																							
Slope (1:X)	15.8	Coefficient of Contraction	0.600																							
Length (m)	29.000	Upstream Invert Level (m)	7.800																							
Roughness k (mm)	0.150																									
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Event: 480 min Winter



Event: 600 min Winter



Waterco Ltd		Page 7
Eden Court Lon Parcwr Business Park Denbighshire LL15 1NJ	Ffos Y Fran Bargoed Taff North East	
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