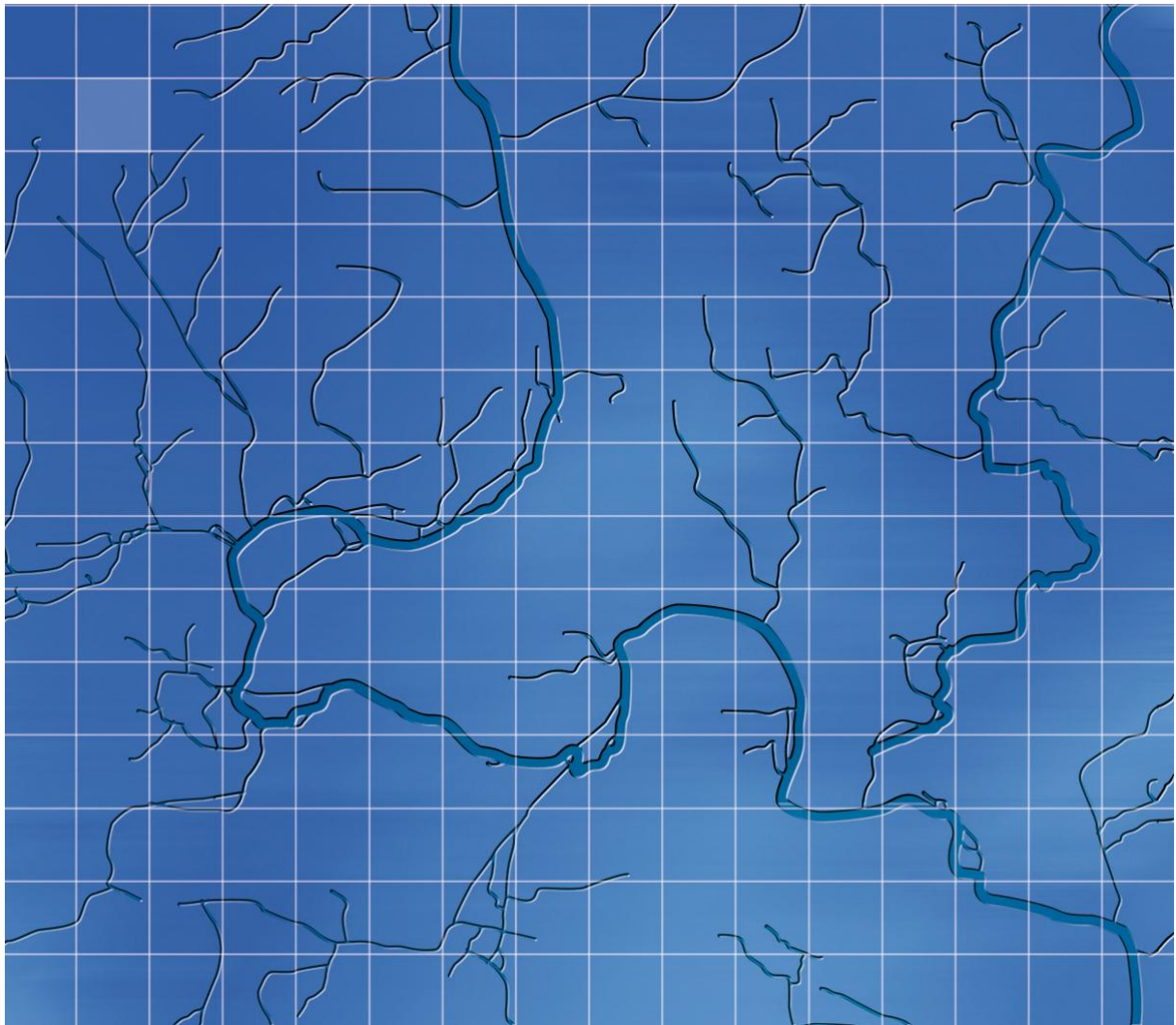


Blaenau Gwent County Borough Council

September 2025

Blaenau Gwent County Borough Level 2 Strategic Flood Risk Assessment



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For and on behalf of Wallingford HydroSolutions Ltd.

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1 Introduction

Wallingford HydroSolutions Ltd has been commissioned by Blaenau Gwent County Borough Council (BGCBC) to undertake a Level 2 Strategic Flood Consequence Assessment (SFCA) in accordance with Technical Advice Note 15 (TAN15)¹ and hydraulic modelling guidance² from Natural Resources Wales (NRW).

The main analysis and documentation on flood risk for Blaenau Gwent currently comprises a Level 1 SFCA³, completed in June 2023 to assess 122 proposed site allocations. Following this analysis, one site (T025- Land at Tredegar Business Park) was identified as requiring a Level 2 SFRA, given that a significant amount of land for development cannot be allocated outside flood risk areas.

The site is located on the right bank of the Sirhowy River at NGR: 314460, 208930. In the existing Flood Map for Planning, the majority of the site is shown to be in Flood Zone 3, with flood risk associated with the Sirhowy River. The National Mapping is currently informed by JFLOW modelling, a relatively coarse method of flood risk modelling only suitable for strategic purposes.

Detailed hydraulic modelling has since been undertaken to support the level 2 assessment and improve understanding of flood risk at the site. This has also been accompanied by a flood map challenge to update the existing flood map.

The Level 2 SFRA includes a detailed assessment of flooding at the site based on the updated model data and existing information on flood defences, surface water flood mapping and historical flood data. The assessment also includes guidance for the preparation of a site-specific Flood Consequence Assessment (FCA), including information about the use of SuDS and the need for mitigation measures. From this information the appropriateness of development on the site has been determined.

¹ Welsh Government (2025) *Technical Advice Note 15* <https://www.gov.wales/technical-advice-note-tan-15-development-flooding-and-coastal-erosion>

² NRW (2025) Challenging our flood maps <https://naturalresources.wales/flooding/challenging-our-flood-maps/?lang=en>

³ WHS (2023) Blaenau Gwent Strategic Flood Consequence Assessment *WHS1855 - Blaenau Gwent SFCA v3.0.pdf*

2 Methodology

2.1 Sources of Data

This Level 2 SFRA presents an assessment of the risk of flooding from all sources at the Land at Tredegar Business Park (T025) site. To inform this, the results from the detailed hydraulic model of the Sirhowy River developed for this study have been reviewed. Alongside this existing information and model data, other sources of flooding have been identified and assessed.

The main sources of data used to inform this SFRA include;

- Hydraulic model for the Sirhowy River developed by WHS (2025) – to assess fluvial flood risk at the sites identified. Hydraulic modelling report provided in Appendix 1.
- NRW Flood Map for Planning (FMfP) Surface Water and Small Watercourses Zones⁴ – to quantify the pluvial flood risk and flood risk from small watercourses (catchment size <3 km²) where appropriate
- NRW FMfP Flood Risk from Reservoirs⁵ – to quantify the risk of reservoir flooding
- NRW FMfP Recorded Flood Outlines⁶- to review historical flood events
- NRW FMfP TAN15 Defended Zones⁷- to identify any areas that benefit from flood defences with a minimum standard of protection (SOP) of 100-year (present-day)
- NRW Flood Defence Structures⁸ – To assess existing formal and informal flood defences
- Dwr Cymru Welsh Water (DCWW) sewer data⁹ – to determine risk of sewer flooding based on incidences of nearby sewer flooding.
- Flooding incident data provided by BGCBC¹⁰ – to provide information on local and historical flooding from surface water flooding across the study area
- British Geological Survey (BGS) geoviewer¹¹ – To determine local bedrock and its expected permeability informing assessment of groundwater flood risk
- Soilsmap¹² – To determine local soil and its expected permeability informing assessment of groundwater flood risk

2.2 Assessment of Flood Risk

For the site, a detailed assessment of the nature of flood hazard was undertaken. This included using the relevant fluvial modelling data to assess:

- The proportion of the site inundated for a range of return periods
- The speed of onset
- Flood depth
- Flood velocity
- Flood Hazard

⁴ NRW (2025) *FMfP Surface Water and Small Watercourses Zones* <https://flood-map-for-planning.naturalresources.wales/>

⁵ NRW (2025) *FMfP Flood Risk from Reservoirs* <https://flood-map-for-planning.naturalresources.wales/>

⁶ NRW (2025) *FMfP Recorded Flood Outlines* <https://flood-map-for-planning.naturalresources.wales/>

⁷ NRW (2024) *FMfP TAN15 Defended Zones* https://datamap.gov.wales/layergroups/geonode:nrw_flood_defence_structures

⁸ NRW (2024) *Flood Defence Structures* https://datamap.gov.wales/layergroups/geonode:nrw_flood_defence_structures

⁹ DCWW (2021) *Blaenau Gwent Sewer Flood Risk 28.06.21*

¹⁰ BGCBC (2021) *All flood incidents records*

¹¹ BGS (2025) *BGS Geology Viewer*, <https://geologyviewer.bgs.ac.uk/>

¹² Cranfield Soil and Agrifood Institute (2025) *Soilsmap*, <http://www.landis.org.uk/soilsmap/>

The sites were assessed against a range of return periods, however the design event, the 100-year (plus 25% climate change) event, was considered most important for planning purposes.

In addition to the analysis of modelling data, the location, standard and condition of existing flood defences was assessed. Other sources of flooding were also reviewed at each site. This included an assessment of surface water flooding and an assessment of groundwater flooding based on available hydrogeological information from BGS and Soilscales. Potential access/egress routes were identified with respect to the risk posed from all sources of flooding.

Following a review of flood risk, flood defences and the identification of access/egress routes, an assessment was made on whether a future site-specific FCA would be able to show that the site can be allocated for development. The assessment takes into account the flood risk vulnerability of the development, the scale of development proposed along with any requirements for the Justification Test (see section 2.4). In this context, any mitigative actions in the form of ground raising and compensatory storage are identified.

The site assessments also include guidance for the preparation of FRAs, including information about the use of SuDS.

2.3 Application of Flood Zones to Development Plans

A plan led approach is essential for the consideration of flood risk. Local Development Plans (LDPs) are the primary documents for co-ordinating both regeneration and flood risk mitigation activities. Policies on flood risk should not repeat national policy, but rather they should focus on locally specific requirements as informed by the SFCA. Sites should be selected to support the overarching ambitions of the Development Plan and should reflect the placemaking principles set out in Planning Policy Wales (PPW)¹³.

Where development is proposed in a flood risk area facing risk from rivers and the sea, the planning authority will need to be satisfied that its location is justified. The policy and recommendations contained in TAN15 should be considered for both LDPs and individual planning applications, these are summarised for each Flood Zone below.

Zone 1 Summary

- Development of all types should be prioritised in Flood Zone 1, provided allocations support the LDP strategy.
- Planning applications for all development, changes of use, or conversions are acceptable in principle when located in Flood Zone 1.
- Greenfield land even where it is in Flood Zone 1 could provide an important space to manage flood water. Once land becomes developed, it has a reduced ability to store excess water, in particular during floods of a higher magnitude.

Zone 2 Summary

- Development and redevelopment may be allocated in Flood Zone 2 if they support the LDP strategy, regeneration, economic/environmental goals, or national/energy security. This is provided SFCA shows acceptable risk.

¹³ Welsh Government (2024) *Planning Policy Wales Edition 12*
<https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>

- New highly vulnerable development on greenfield land is only appropriate if allocated in adopted Development Plans.
- Planning applications must be consistent with section 11 of TAN15, and supported by a FCA, and demonstrate acceptable risk.
- For residential redevelopment, ground floor use should be avoided, tolerable conditions (section 11) must be met, and resilient flood design (section 13) applied.

Zone 3 Summary

- In Zone 3 allocations for highly vulnerable new development must not be made as the risks and consequences of flooding are not considered acceptable for these types of development.
- Allocations for less vulnerable new development should only be made in exceptional circumstances such as addressing national security or energy security needs, reasons of public health or to mitigate the impacts of climate change which have a clear locational need and cannot be located elsewhere.
- Water compatible development is acceptable in all flood zones including Zone 3.
- Allocations for redevelopment in zone 3 should be avoided and may only be made in exceptional circumstances (see above).
- Planning authorities must not allocate sites for highly vulnerable redevelopment unless there is a clear commitment that flood mitigation measures will be provided to protect those sites.
- Planning applications must be consistent with section 11 of TAN15, and supported by a FCA, and demonstrate acceptable risk.
- For residential redevelopment, ground floor use should be avoided, tolerable conditions (section 11) must be met, and resilient flood design (section 13) applied.

Defended Zone Summary

- Defended zones help planning authorities consider development in areas that might otherwise be designated as high-risk Flood Zone 2 or Flood Zone 3. However, they are a screening tool, not automatically suitable for development.
- As a pre-requisite to proposing any development in Defended Zones Local Planning Authorities must understand fully the quality and condition of existing flood defences and the level of protection they afford both now and in the future.
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- As a general principle LDPs should seek to avoid intensification of uses in Defended Zones and redevelopment schemes should be broadly the same scale as existing uses.
- Greenfield sites can provide important flood attenuation opportunities and have the ability to store a manage water in the event of flooding, they should not be built on unless they are replaced by suitable alternative sites which clearly contribute to flood management enhancement.
- Before allocating land in Defended Zones, Local Planning Authorities will have undertaken a full flood risk assessment through an SFCA, and other additional studies if necessary, to understand the probability and potential consequences of flooding in the area.

3 Site Description

3.1 General Location Plan

The Tredegar Business Park (T025) site is located in an urbanised area to the east of central Tredegar, see Figure 1. It is bordered by industrial estates to the north and south, the Gwent shopping centre to the west and Sirhowy River to the east.

In the Replacement Local Development Plan (RLDP) it is proposed for a range of employment uses (B1- offices/B2-industrial uses/B8-storage & distribution).

3.2 Topography

Based on 1m LIDAR data, the site is relatively flat and is bordered by higher ground to the southwest. The ground levels within the site boundary range from 291.90 to 300.81 m AOD. The average ground level is 295.38 m AOD.

3.3 Nearby Watercourses

The closest watercourse is the Sirhowy River which runs in a north to south direction immediately east of the site. An unnamed watercourse confluences with the Sirhowy River on the opposite bank to the site, it is thought to be culverted. Figure 1 shows the location of these watercourses.

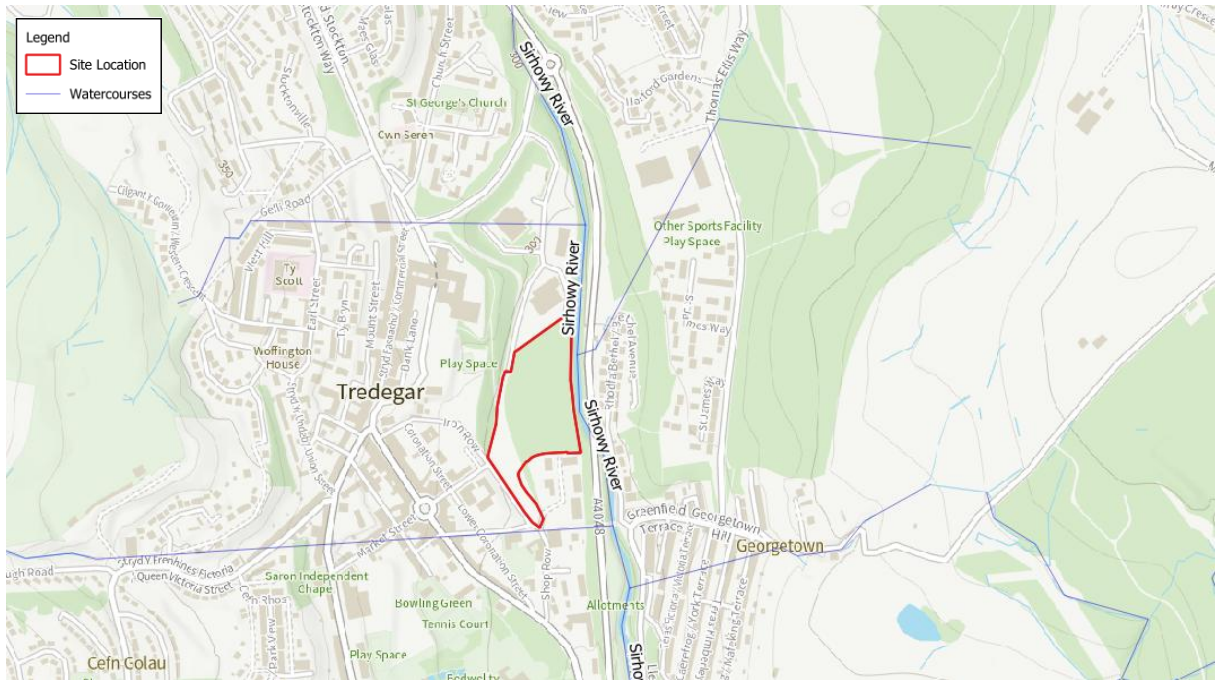


Figure 1 - Site Location

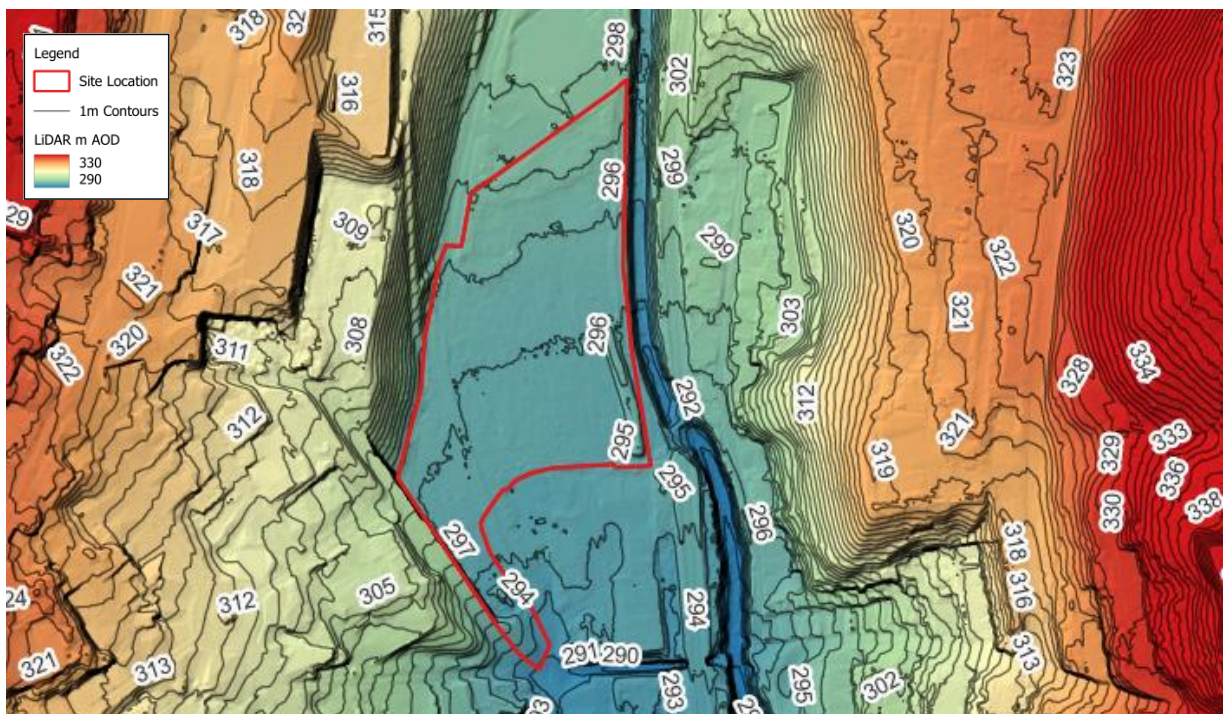


Figure 2 - Topography

4 Flood Risk

4.1 Historical Flooding

NRW has no record of historic flooding at the location of the site. The closest record of flooding is 9.6 km to the southeast of the site at Aberbeeg, associated with flooding from the River Ebbw.

4.2 Fluvial Flood Risk

In the existing FMfP, the majority of the site lies within fluvial Flood Zones 2 and 3, associated with flooding from the Sirhowy River, see Figure 3.

In terms of the updated model results (see Figure 4), the equivalent 1.0% AEP + climate change and the 0.1% AEP + climate change events show a general reduction in flood extents. The entire site is now shown to be flood free up to and including the 0.1% AEP + climate change event. Indicating that fluvial flood risk is low. These results are assessed in more detail in section 5.

4.3 Flood Defence Infrastructure

There is no flood defence infrastructure in the vicinity of the site. The site is also not located within a TAN15 defended zone.

4.4 Surface Water Flood Risk

The surface water flood maps show partial flooding of the site. This is mostly limited to the southern portion of the site and is associated with urban runoff from the north and west of the site. It is most widespread for the 0.1% AEP + climate change event (Flood Zone 2), with limited extent in the 1.0% AEP + climate change event (Flood Zone 3), see Figure 5. Overall, the risk of surface water flooding is considered to be low.

4.5 Groundwater Flooding

The site is underlain by a bedrock of mudstone, siltstone and sandstone in the form of the South Wales Middle Coal Measures Formation. It is expected to permit moderate infiltration. Restored soils mostly from quarry and opencast spoil overlie this, these are expected to have variable drainage. Based on the data available the water table at the site could be mobile, translating to a moderate risk of groundwater flooding. However more data is required at the planning stage to confirm this.

4.6 Reservoir Flood Risk

The FMfP shows that the majority of the site is at risk from reservoir flooding. This is associated with a breach event at two reservoirs upstream located at NGR: 312845, 211625 and NGR: 312700, 210060 respectively. Whilst areas on the site are shown to be at risk, it should be noted that reservoir failure is a rare event with a very low probability of occurrence. Current reservoir regulations, which have been further enhanced by the Flood Water Management Act¹⁴, 2010 aims to make sure that all reservoirs are properly maintained and monitored to detect and repair any problem.

4.7 Flood Warning Service

The site is not located within an NRW Flood Warning Area.

¹⁴ UK Parliament (2010) *Flood and Water Management Act*, <https://www.legislation.gov.uk/ukpga/2010/29/contents>

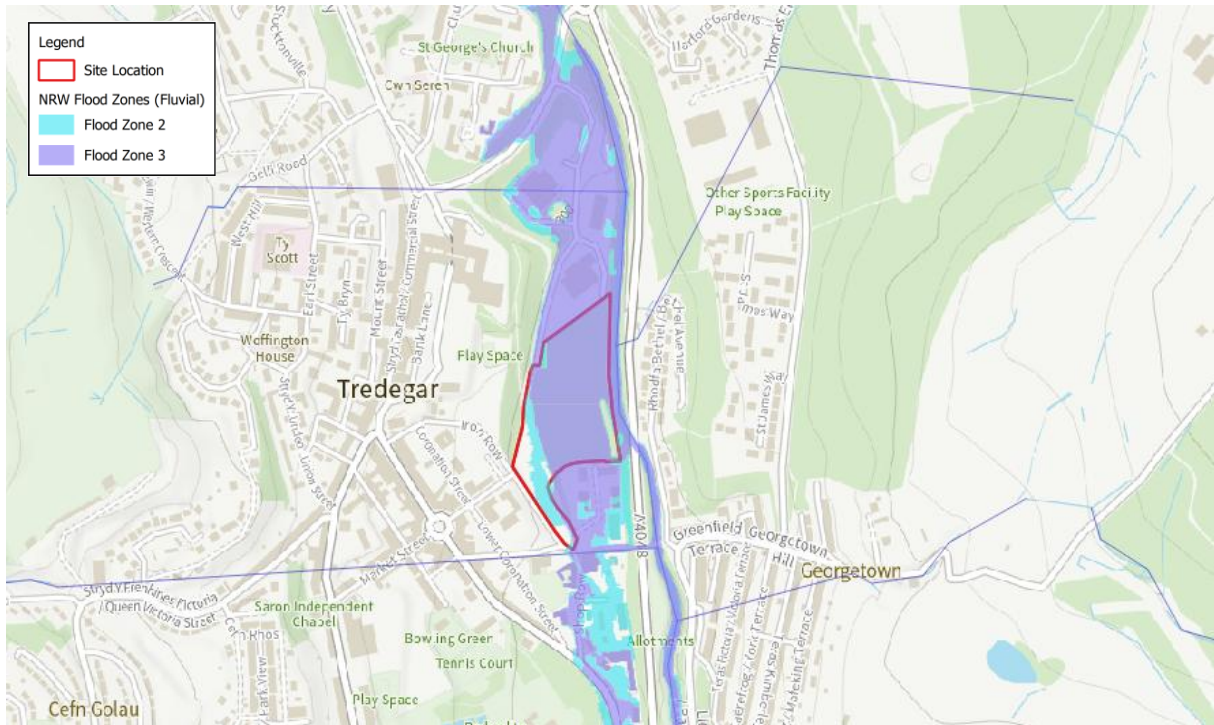


Figure 3 – Existing Fluvial Flood Map

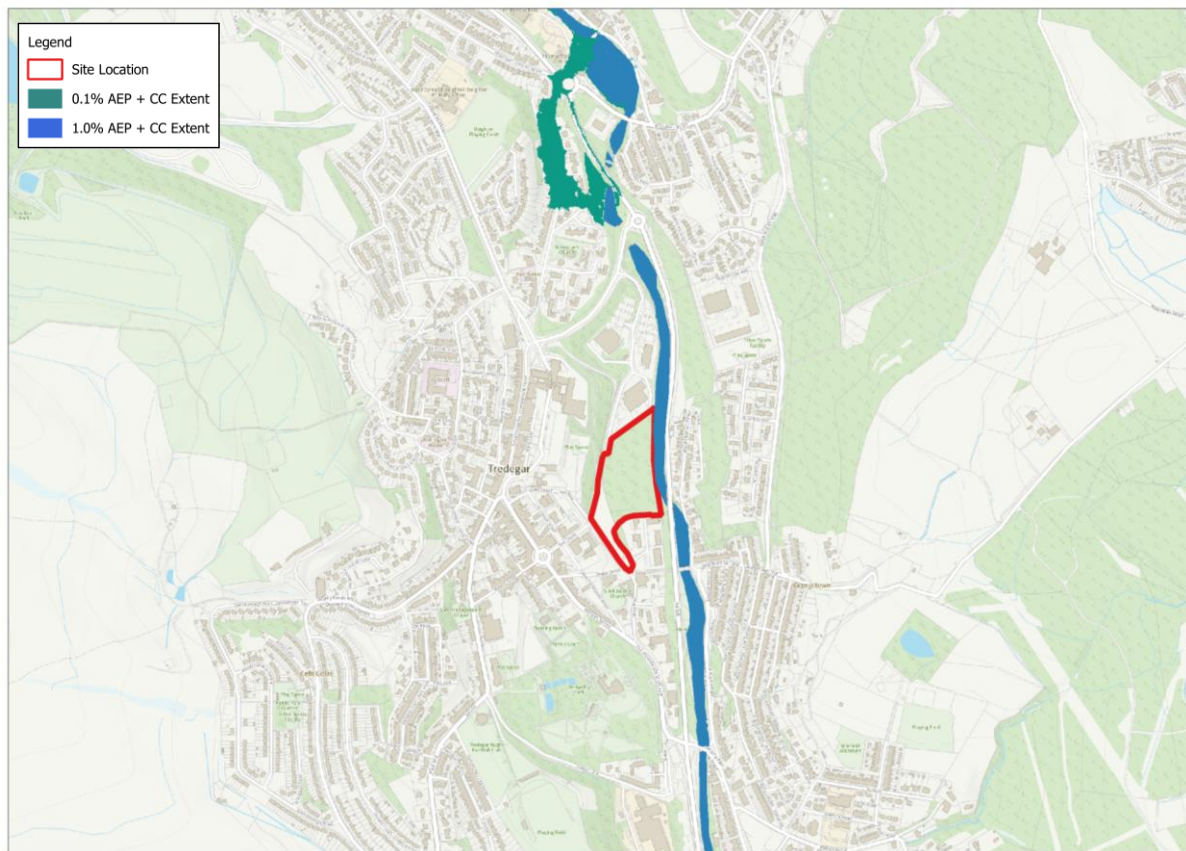


Figure 4 – Flood Map based on updated Sirhowy River model

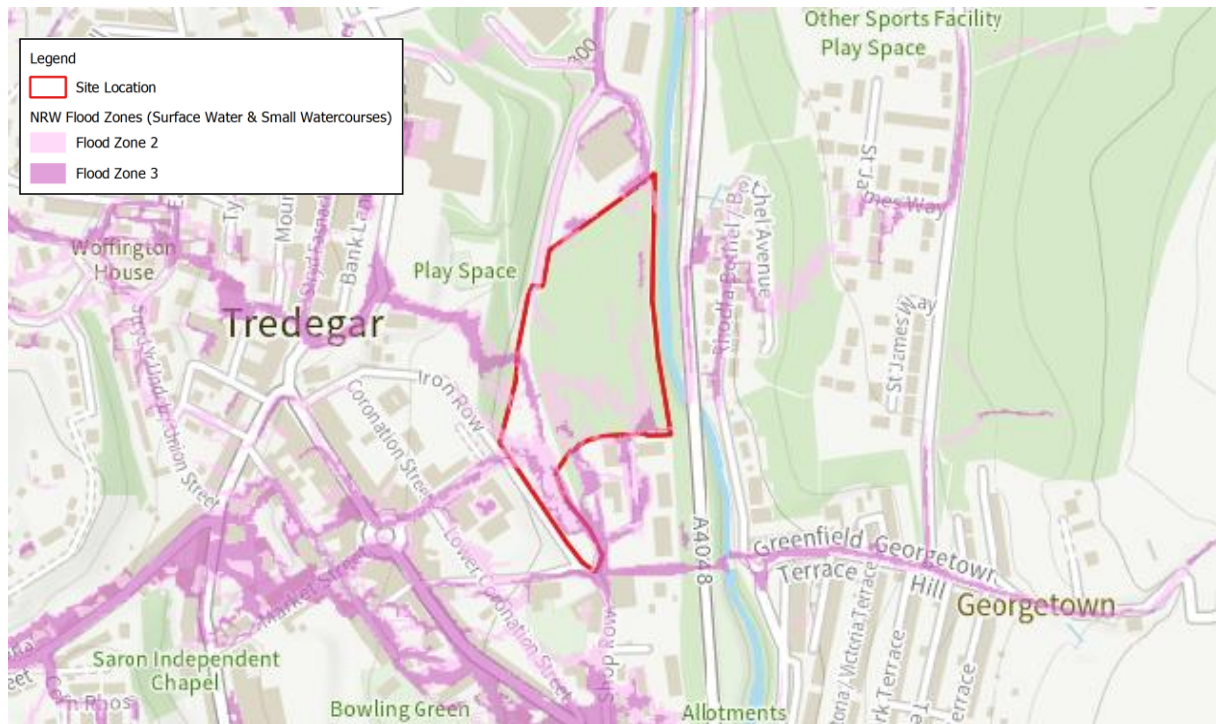


Figure 5 – Surface Water Flood Map

5 Review of Model Results

The primary flood risk to the site in existing flood maps is fluvial in origin. However, detailed hydraulic modelling has been undertaken which show that the level of risk is currently overestimated.

The updated model results show floodwater to remain in bank in the vicinity of the site for all events up to and including the 0.1% AEP + CC event. Access and egress routes are also available to/from the site. Figure 6 shows the modelled flood levels and Table 1 shows the specific levels extracted at the four points marked, they are all significantly below the adjacent ground levels at the site.



Figure 6 – Modelled Flood Levels m AOD for 0.1% AEP + Climate Change event

Table 1- Modelled Flood Levels at Sample Points

Event	Point 1 Flood Level (m AOD)	Point 2 Flood Level (m AOD)	Point 3 Flood Level (m AOD)	Point 4 Flood Level (m AOD)
1.0% AEP + CC	296.620	294.325	292.338	290.824
0.1% AEP + CC	297.196	294.880	292.984	291.805

As there is no fluvial flooding at the site an assessment of the proportion of the site inundated for a range of return periods, the speed of onset, flood depths, flood velocities and flood hazard is not required.

The large reduction in flood extents is due to improved representation of the river channel, in channel structures and hydrological inflows for the catchment. In terms of the river channel, the Sirhowy River near Tredegar and in the vicinity of the site is deeply incised. For example, the cross sections surveyed adjacent to the site have depths of 3-5m from its bed to the top of western bank where the site is located (see photograph of channel in Figure 7). The refined representation of in-channel structures and storage upstream may also be key. There are a series of structures upstream and downstream of the site including weirs, bridges and culverts. These have a significant effect on flow conveyance altering the distribution of flooding seen in the FMfP where they are not represented. Finally, the hydrological inflows for the updated model have been derived using the latest FEH

methods and represent an improved understanding of hydrology within the catchment based on the information currently available. Based on the reduction in flooding it is assumed that they are lower than the inflows informing the FMfP which are expected to be based on the older FEH-13 rainfall model.



Figure 7 – Survey photograph of channel in vicinity of the site taken from right (west) bank

6 Site Specific FCA recommendations

Whilst there is no fluvial flooding at the site based on the updated model results, in the existing FMfP surface water flooding still presents a risk to the southern part of the site. However given its extent, it should not be a significant barrier to development as a large majority of the site is not at risk. However, several roads to the west and north of the site from are shown to be at surface water risk. A site-specific FCA should consider in more detail the nature of the surface water flood risk to determine how quickly it occurs and the degree of hazard on site. The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that pluvial flood risk at the site and to third party land is not increased.

In assessing and demonstrating the viability of any SuDS solution for the site, a site-specific FRA should follow the SAB technical standards for SuDS and any relevant Local Authority Local Plan policies. The geology at the site means that the significant use of infiltration SuDS solutions is unlikely to be viable, however partial infiltration solutions may be achievable. It is recommended that a geotechnical investigation is undertaken at this site to obtain further information relating to infiltration rates, this will confirm whether infiltration could be viable in some areas. Attenuated discharge to a watercourse or a sewer will also need to be considered as part of a site-specific FCA. Based on levels at the site a gravity connection to the Sirhowy River should be possible if required.

7 Summary

Overall, a new employment development at the site should be possible. Based on the updated model results the site lies outside of Flood Zone 2 and 3. In this regard it follows the principles of TAN15 to direct new development to areas at minimal risk of flooding- areas in Flood Zone 1.

Whilst other sources of flood risk are present on the site, most notably surface water flooding in the south of the site, it is limited in extent and should not present a barrier to development provided suitable analysis is undertaken to inform the development layout and SuDS principles are followed.

Appendix 1 – Hydraulic Modelling Report