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Cardiff Council Strategic Flood Consequences Assessment - Velindre Cancer Centre (76)

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Contract

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This report describes work commissioned by Cardiff Council, by an instruction dated 23rd January 2026. The Client's representative for the contract was Stuart Williams of Cardiff Council. Polly Stradling of JBA Consulting carried out this work.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between January to May 2026 and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by JBA has not been independently verified by JBA, unless otherwise stated in the Report.

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1 Introduction

JBA Consulting has been commissioned by Cardiff Council to prepare an independent Flood Risk Appraisal as part of a Stage 2 Strategic Flood Consequences Assessment (SFCA) for sites considered for allocation in its Replacement Local Development Plan.

This assessment will evaluate the risk of flooding from all sources to Velindre Cancer Centre, the proposed development site, as well as the appropriateness of development at the site in accordance with Welsh Government policy, as outlined in Technical Advice Note 15 (TAN15). Furthermore, recommendations will be provided, where appropriate, to mitigate the risk of flooding at the proposed development site as well as recommendations for further works.

2 Site Description

The key characteristics of the site are summarised in Table 2-1 and the location and site boundary are shown in Figure 2-1 below.

Table 2-1 Site Summary

Site name	Velindre Cancer Centre
Site ID	76
Site area (ha)	4
Existing land use	Medical Centre
Purpose of development	Residential and Ancillary mixed use
OS NGR	ST 14822 80453
Access location	Access from Velindre Road

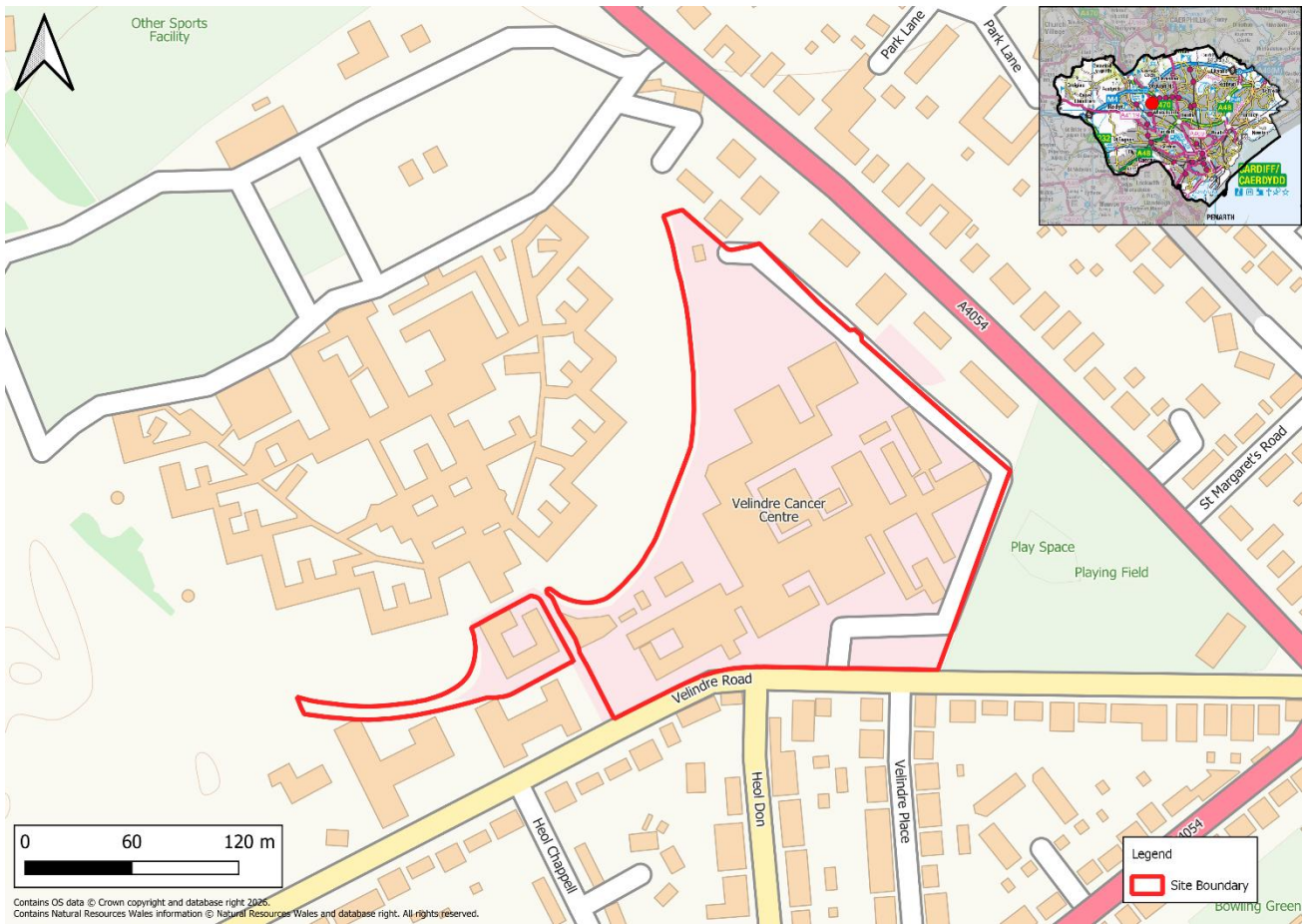


Figure 2-1 Proposed development site

2.1 Development proposals

The proposed development is for residential and ancillary mixed use, at the existing Velindre Cancer Centre which remains operational. Residential development is classed as Highly Vulnerable development, whilst any other development shall constitute Less Vulnerable development. The proposed site has been split into two parcels of land.

No indicative site layout is available for this assessment.

2.2 Topography

The Natural Resources Wales (NRW) Open Source 1m Light Detection and Ranging (LiDAR) data¹ across the site has been reviewed and is shown in Figure 2-2.

Ground levels generally fall in a southerly direction, with the highest elevation in the north at 38.20 mAOD. Lowest levels are around 36.17 mAOD in the southeast of the site.

Across the site LiDAR is shown to be patchy, which is likely to be as a result of the removal of above-ground features during DTM processing.

¹ <https://datamap.gov.wales/maps/lidar-data-download/>

Externally to the site boundary to the north of the development, ground levels are raised higher than the site with maximum levels of 37.5 mAOD.

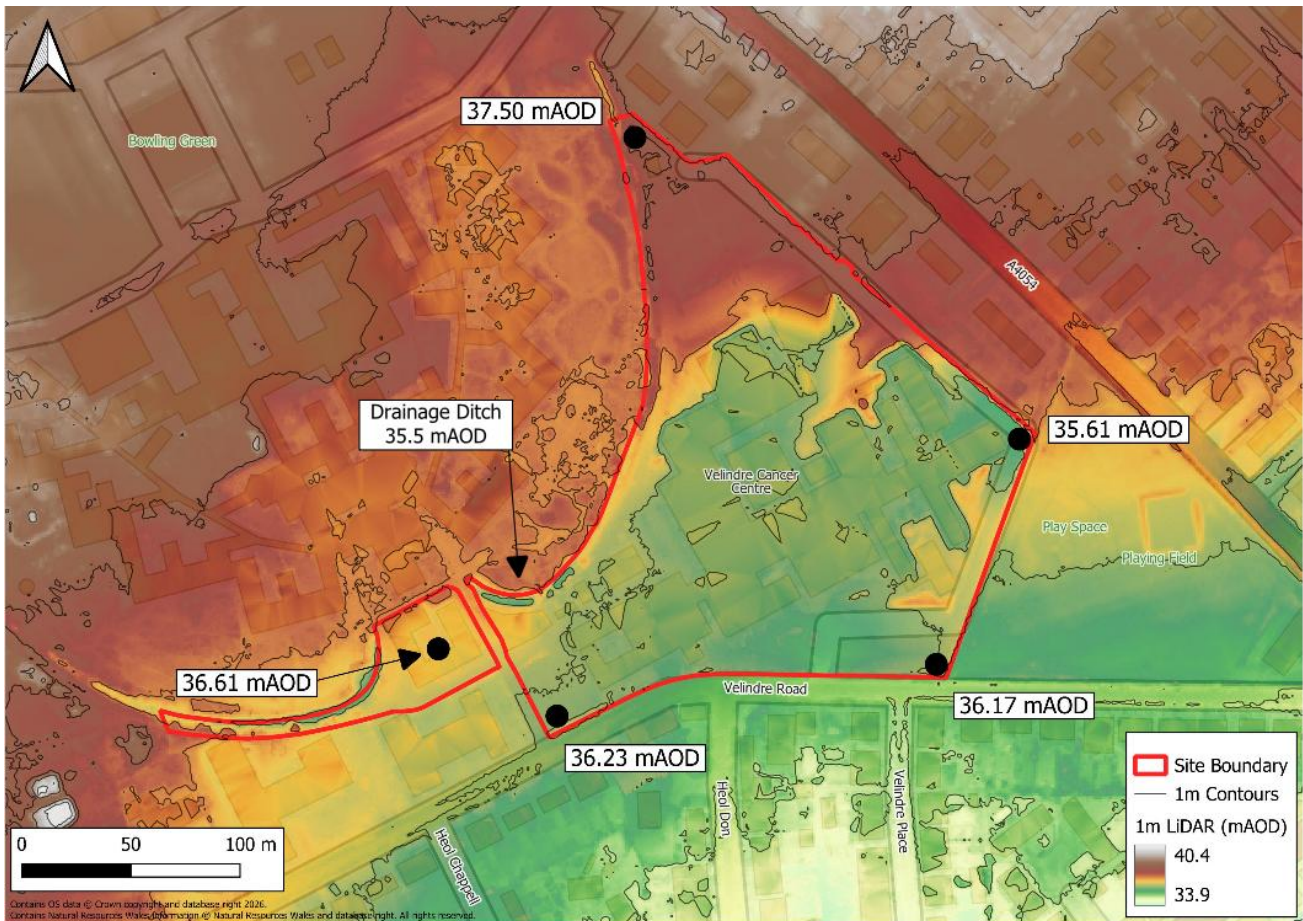


Figure 2-2 1m LiDAR

2.3 Watercourses and Flood Defences

Figure 2-3 shows the locations of the nearest waterbodies and watercourses to the site.

Within the site boundaries, there is a small open channel that runs along the northwestern boundary of the development, with invert levels of 35.5 mAO. Full connectivity of the watercourse is unknown.

The River Taff, an NRW Main River is located 0.24km to the west of the site.

The Glamorganshire Canal is located 0.23km to the west of the site.

The site is not located within an area that benefits from flood defences.

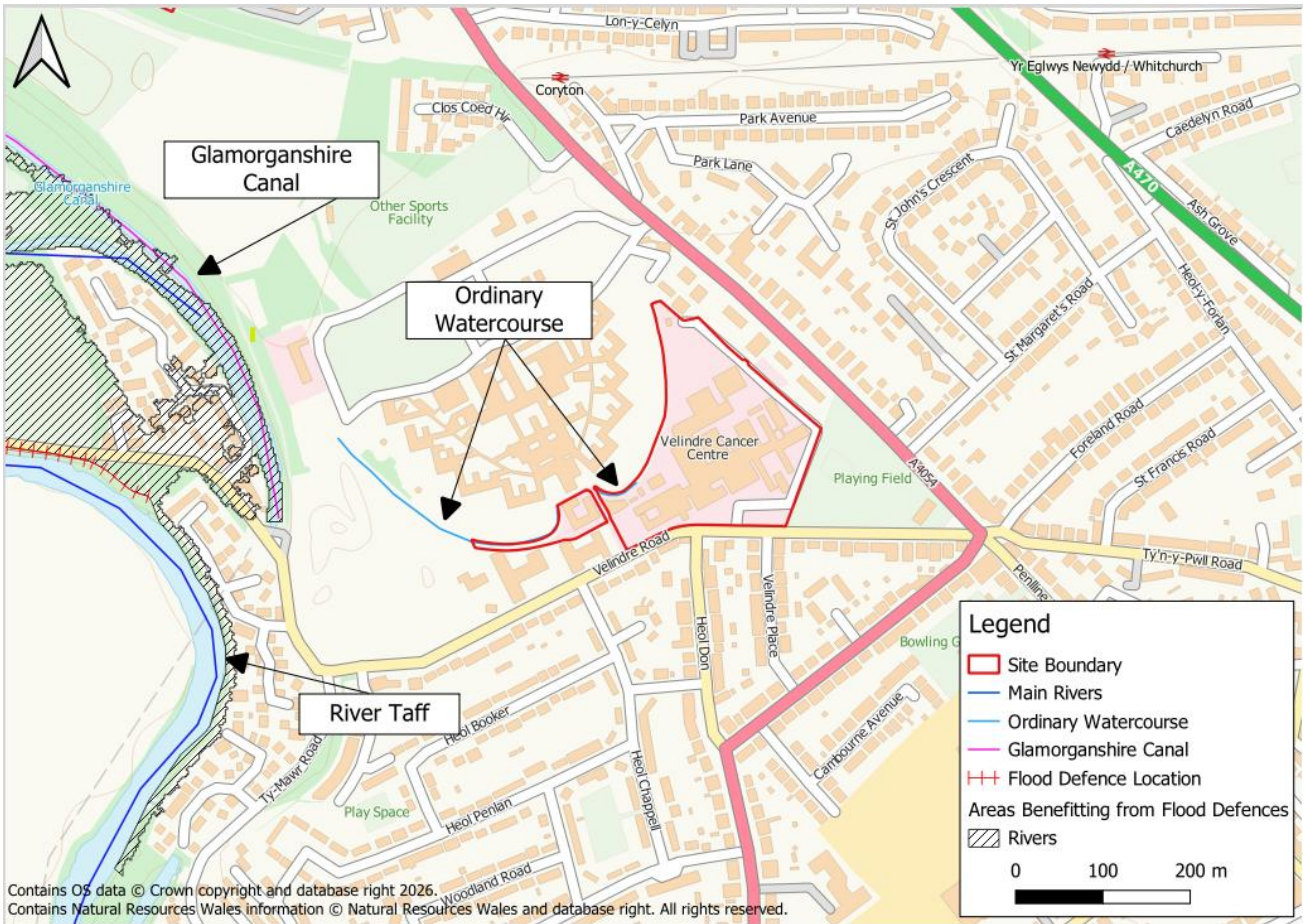


Figure 2-3 Watercourses and Flood Defences

3 Planning policy and flood risk

TAN-15 provides a framework within which flood risk arising from rivers, the sea, and surface water, as well as the risk of coastal erosion, can be assessed. TAN-15 adopts a risk-based approach, which emphasises the ability to avoid or minimise risk depending on the type of development proposed.

The following table identifies the form of development, vulnerability classification and Flood Map for Planning (FMfP) classification (as defined in TAN-15) for the proposed development site.

Table 3-1 TAN-15 Development classification summary

TAN-15 classification	Classification
Development proposal	Residential and mixed-use ancillary
Form of Development	Redevelopment
Vulnerability Classification	Mixed - Highly Vulnerable and Less Vulnerable uses proposed
Flood Map for Planning - Rivers	Flood Zone 1
Flood Map for Planning - Sea	Flood Zone 1
Flood Map for Planning - Surface Water and Small Watercourses	Flood Zone 1, 2 and 3 - shown in Figure 3-1.

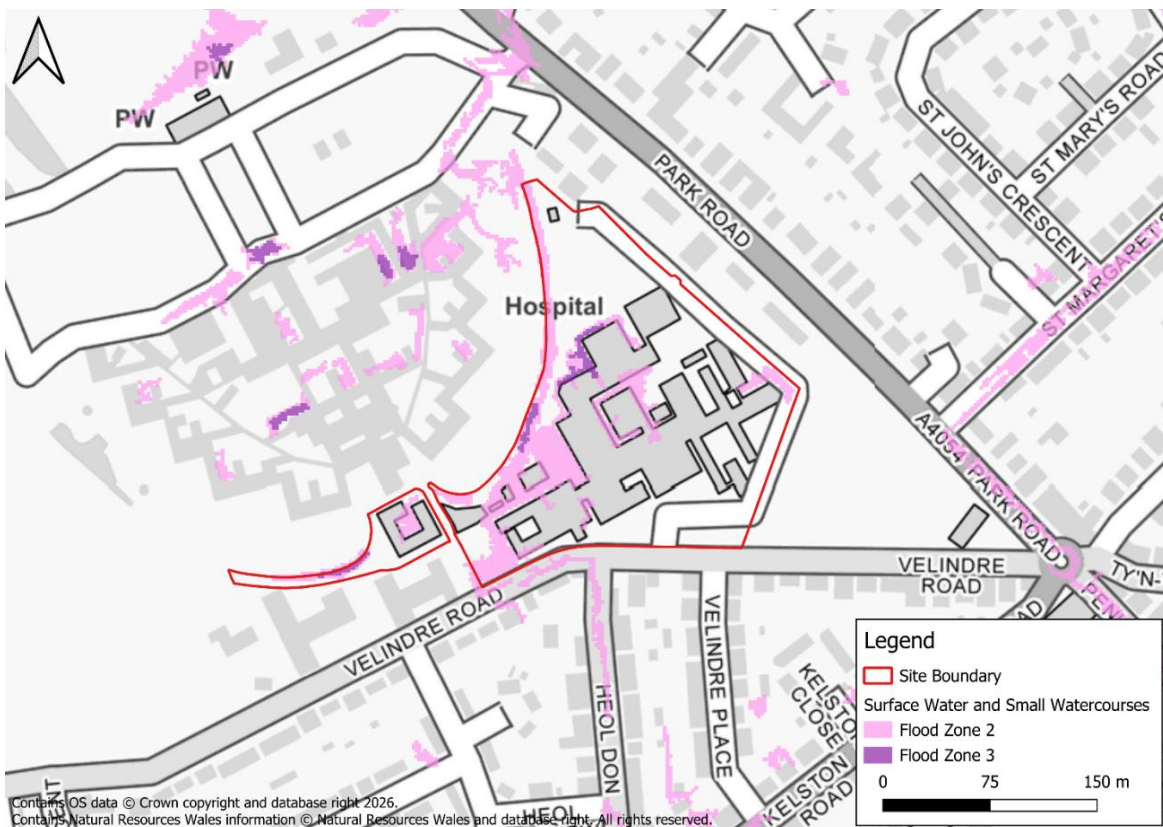


Figure 3-1 Flood Map for Planning - Surface Water and Small Watercourses

4 Assessment of flood risk

The latest available information on flood risk at the site, published by Natural Resources Wales (NRW) and datasets used in the SFCA is summarised in Figure 4-1.

Table 4-1 Summary of Flood Risk

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	✘	The site's location within Flood Zone 1 of the FMfP for Rivers indicates that the site is at very low risk of fluvial flooding.
Flood Risk from the Sea	✘	The site's location within Flood Zone 1 of the FMfP for the Sea indicates that the site is at very low risk of tidal flooding.
Flood Risk from Surface Water and Small Watercourses	✓	The site is at moderate risk of surface water flooding and has been further assessed in Section 4.1.
Flood Risk from Groundwater	✘	The Cardiff SFCA includes JBA's Groundwater risk of emergence map as part of the assessment. The groundwater depth map showed the site to be of very low risk, and there are no nearby groundwater incidents. Therefore, it is concluded that the risk of flooding is very low .
Flood Risk from Reservoirs	✘	The NRW Flood Map for Planning shows that the site is not located in an area at risk of reservoir flooding. Therefore, it is concluded that the risk of flooding is very low .
Flood Risk from Sewers	✘	The Cardiff SFCA has identified there to be no historic sewer flood incidents within this area of Cardiff. Therefore, it is concluded that the risk of flooding is very low .

4.1 Flood Risk from Surface Water and Small Watercourses

Surface water flooding occurs when rain falling on saturated ground flows overland, following the local topography. Surface water flooding and subsequent overland flow can therefore pose a risk to both the development site and the surrounding land. Overland flow may originate from the site itself or adjoining land at a higher elevation, from which flow migrates onto the development.

As shown in Figure 3-1, the FMfP for Surface Water and Small Watercourses indicates that most of the site is located within Flood Zone 1. Localised areas, mostly in the western vicinity of the site fall within Flood Zones 2 and 3, associated with localised topographic depressions, and flooding from the watercourse along the northwestern boundary.

In the absence of detailed modelling, National Flood Hazard Mapping (NFHM) has been used to provide a further assessment of flood risk.

Figure 4-1 shows that during the 1% AEP plus climate change event, almost the entire site remains flood free. Two localised areas of surface water ponding are shown within the site boundary, reaching depths of up to 580mm.

Figure 4-2 shows that during the 0.1% AEP plus climate change event, a larger proportion of the western area is affected by flooding. In this scenario, flood water enters the site from the ordinary watercourse and is mostly concentrated along the northwestern boundary. Additional localised areas of surface water ponding are shown between existing buildings, with predicted depths up to ~1m.

Velindre Road, which provides primary access via the southern boundary is shown to remain almost entirely flood free. Only during the 0.1% AEP event, shallow flooding of up to 200mm is shown near to the southwestern corner; however this is not expected to restrict pedestrian or vehicular access.

Due to the broadscale nature of the NFHM dataset, channels, culverts, and other hydraulic structures are often omitted or inaccurately represented in the modelling. This can often result in an overestimation of risk. LiDAR analysis suggests that the watercourse along the western boundary likely becomes culverted before re-emerging as an open channel. Further site specific analysis would help to refine the predicted flood extent.

Additionally, the generalised nature of the NFHM and LiDAR datasets, also explains the modelled surface water ponding between buildings in the central areas of the site. Further LiDAR analysis indicates patchy topography across the site resulting from post-DTM processing (as detailed in Section 2-2), which results in surface water accumulation with limited drainage potential located mostly along the east of the development. These areas correspond to the current building footprint which covers the site. Building structure form barriers to surface water conveyance, effectively trapping water on-site. Actual risk is likely to be lower as on-site drainage systems are not included within the broadscale modelling informing the NFHM.

It is envisaged that the identified surface water and small watercourse flood risks can be effectively managed through good site design and the use of SuDS techniques as part of a comprehensive surface water drainage strategy.

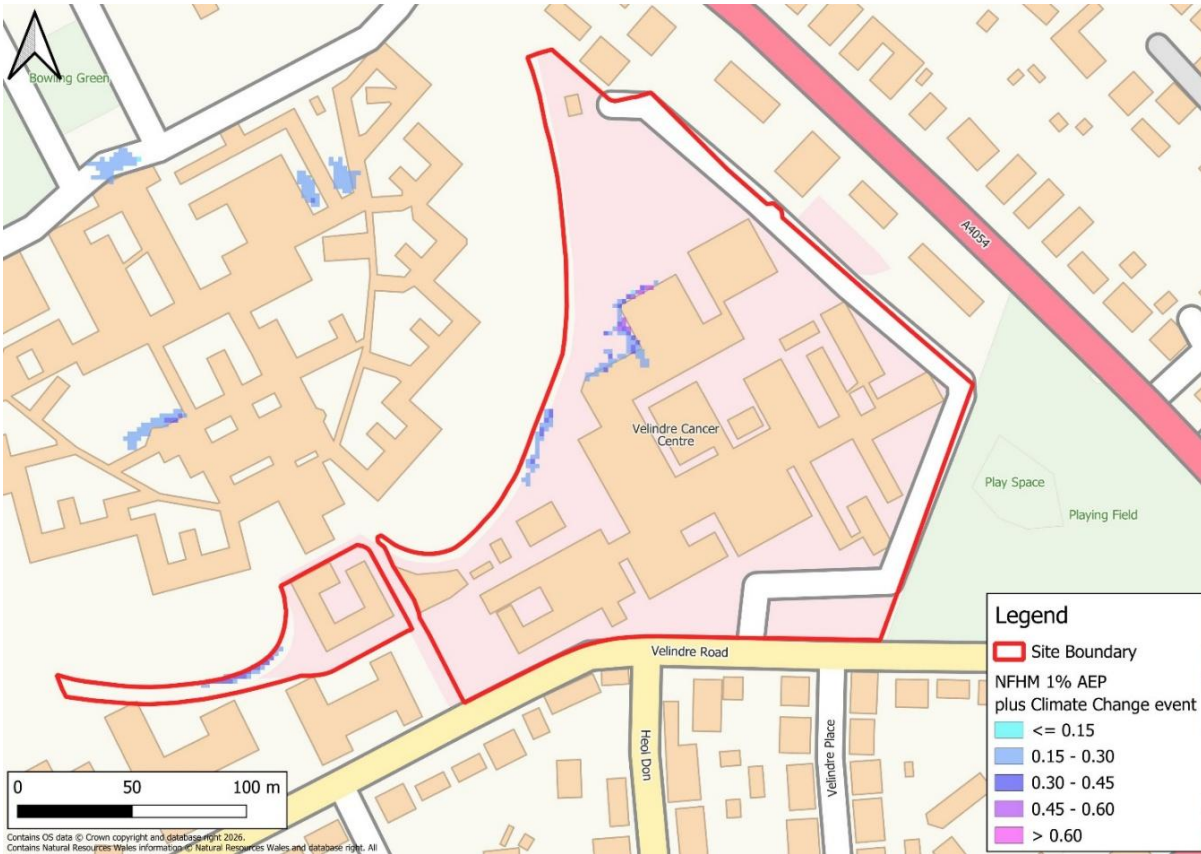


Figure 4-1 Flood Risk from Surface Water - 1% AEP + Climate Change - Flood depths

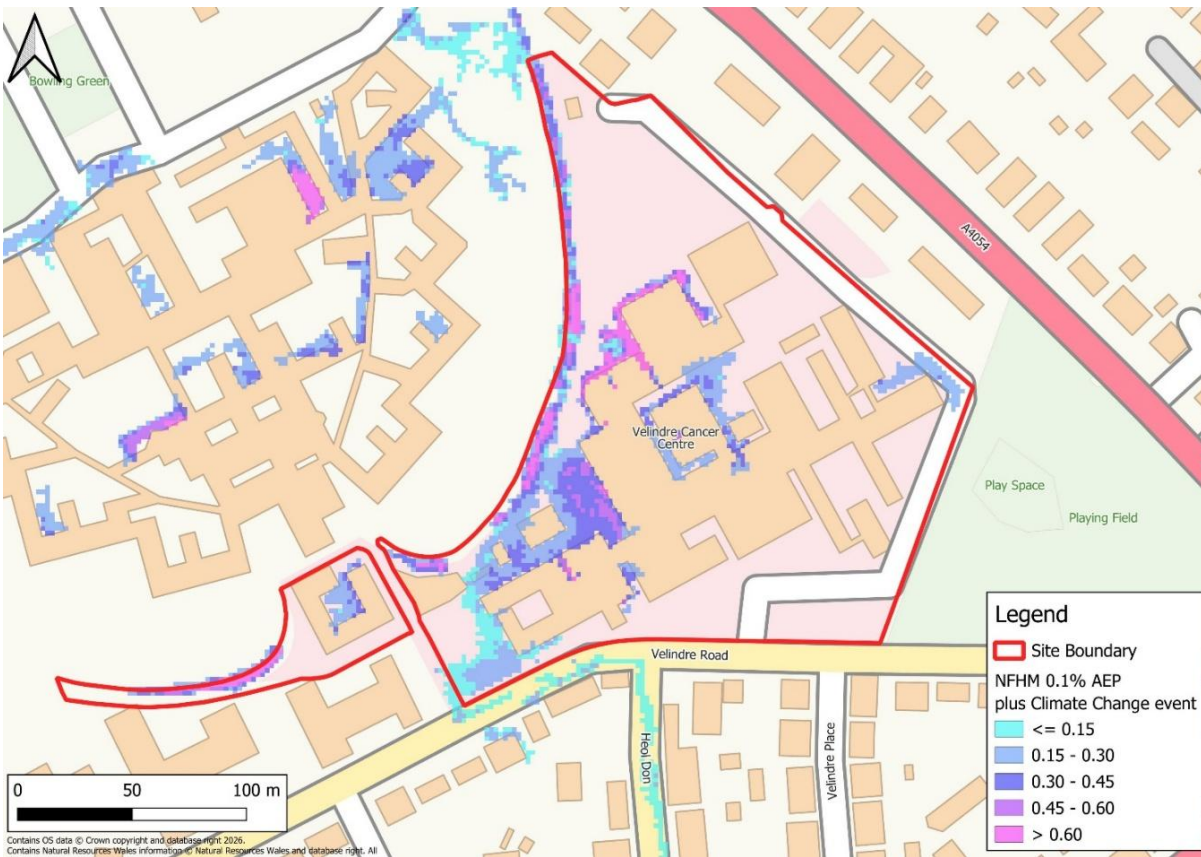


Figure 4-2 Flood Risk from Surface Water - 0.1% AEP + Climate Change - Flood Depths

5 Application of Flood Zones to Development Management Decisions

The site is located within Flood Zone 1 for river and sea flooding. Within Flood Zone 1 all forms of development are acceptable in principle and further assessment or justification is not typically required.

Most of the site is shown to be located within Flood Zone 1 for surface water and small watercourses. However, a proportion of the site is located in Flood Zones 2 and 3, associated with a watercourse along the north western boundary, and localised surface water ponding.

When considering a site for development, Sections 10 and 11 of TAN-15 outline the requirements for the type of development permitted in any given flood zone. However, these sections do not strictly apply to the surface water and small watercourse zones in which this proposed development site lies. Instead, it is for the applicant to demonstrate alignment with the risk-based principles of TAN-15 and the general acceptability criteria of Section 11.4 to ensure the following conditions are met:

- No increase in flooding elsewhere
- Occupiers aware of flood risk
- Escape / evacuation routes present
- Flood emergency plans and procedures agreed and in place
- Flood resistant and resilient design
- Acceptable consequences for type of use (see guidance below)

Given the generalised nature of the FMfP, it is considered that the predicted flood extent and depths may be an overestimation of flood risk to the site if the watercourse and associated culverting is not accurately modelled. It may be beneficial to undertake detailed hydraulic modelling to determine a more accurate understanding of the baseline flood risk to the site to inform redevelopment proposals.

Opportunities to enhance the watercourse corridor should be considered through the provision of public open space and Blue Green infrastructure within this area of the site.

Access and egress is viable via Velindre Road to the south. A localised area of shallow flooding (<0.2m) is predicted during the extreme event only.

Due to the presence of Flood Zone 2 and 3 of the FMfP for Surface Water and Small Watercourses across the site, a planning application should be accompanied by a site specific FCA to assess this risk to the development proposals. It is important that planning authorities are provided with a clear assessment of how a development will affect surface water risks and that these sources can be managed or mitigated, without increasing flood risk elsewhere.

6 Summary and recommendations

The site is located within Flood Zone 1 for river and sea flooding.

The site is mostly located within Flood Zone 1 of the FMfP for Surface Water and Small Watercourses, a proportion of the site lies within Flood Zones 2 and 3. In accordance with TAN-15, this triggers the requirement for an FCA to be completed to support a planning application.

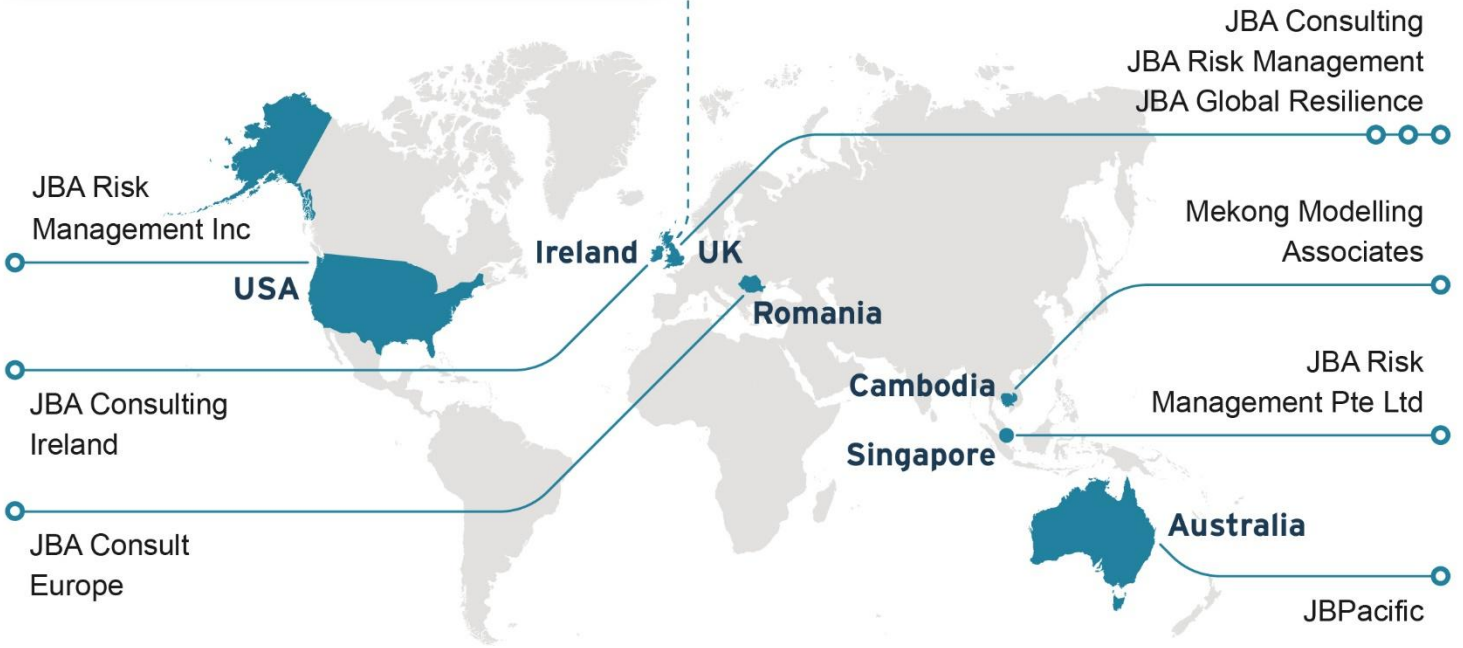
It is therefore considered that this site is likely to satisfy the requirements of TAN-15, subject to the following recommendations:

- Any planning application for the site should be accompanied by a site specific FCA which demonstrates how the proposals meet the requirements of TAN-15.
- It may be beneficial to undertake detailed modelling of the ordinary watercourse on site to further refine the flood extent.
- Surface water flood risk on the site should be managed via SuDS which are implemented in line with the Statutory Standards for SuDS in Wales.



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