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Cardiff Council Strategic Flood Consequences Assessment - Land at Llwynioli Farm (81)

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Prepared by	Polly Stradling BSc (Hons) Assistant Analyst
Reviewed by	Charlotte Lickman BSc (Hons) PG Cert MCIWEM C.WEM Senior Consultant
Authorised by	Faye Tomalin BSc (Hons) MSc MCIWEM C.WEM Project Director

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Contract

JBA Project Manager	Charlotte Lickman
Address	8 High Street, Kings Chambers, Newport, South Wales, NP20 1FQ
JBA Project Code	2026s0106

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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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 Land at 'Llwynioli Farm', 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 Table 2-1 below.

Table 2-1 Site Summary

Site name	Land at Llwynioli Farm
Site ID	81
Site area (ha)	3.3
Existing Land use	Brownfield
Purpose of development	Mixed use - seeking reallocation as part of Strategic Site D
OS NGR	ST 08642 80100

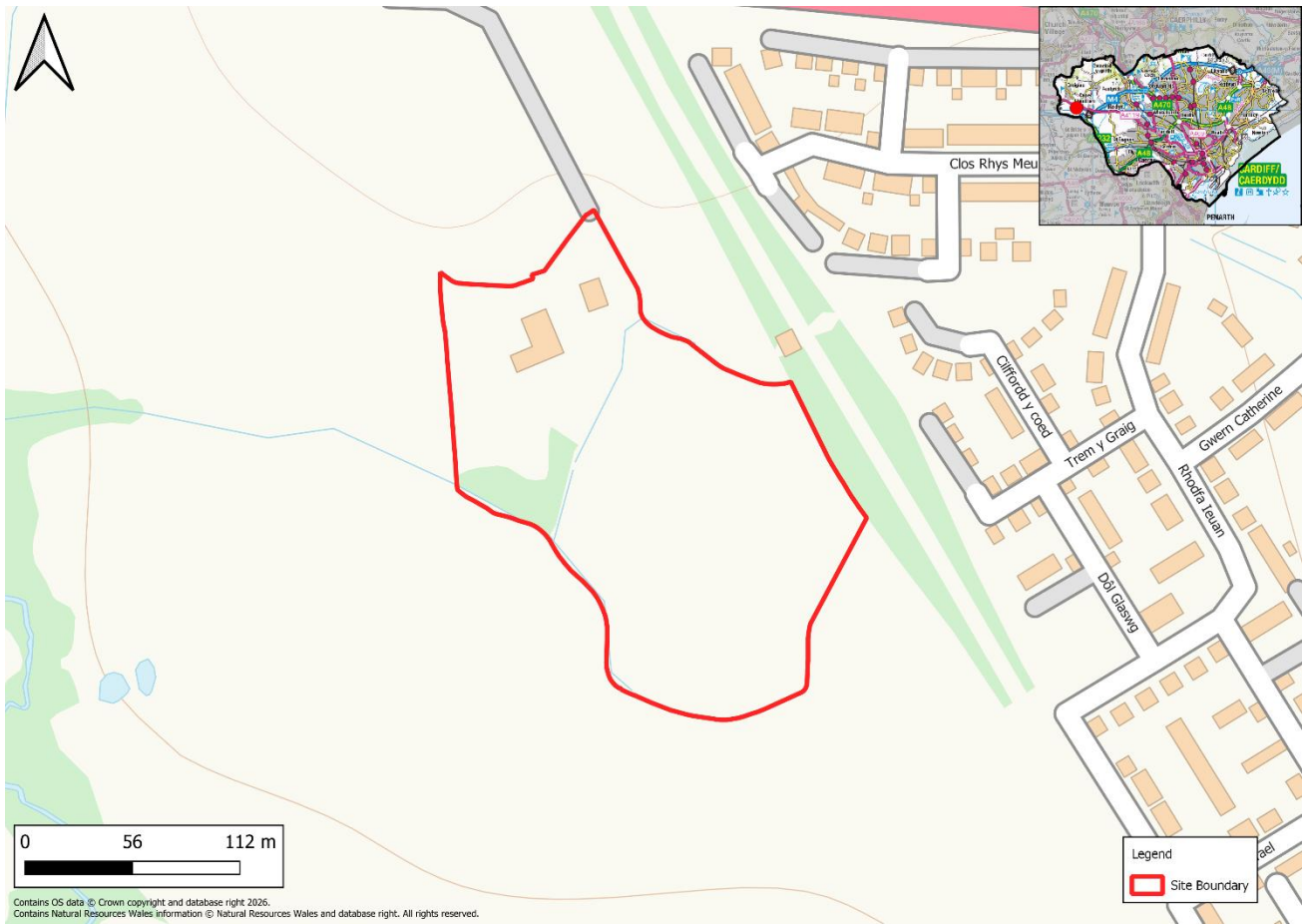


Figure 2-1 Proposed development site

2.1 Development proposals

The proposed development site is for mixed use residential, employment and commercial, and is seeking reallocation as part of Strategic Site D.

The proposed LDP Strategic Site D is North of Junction 33 on the M4 and proposes Circa 2,000 homes, with community uses, employment, and a Park and Ride facility.

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.

Levels across the site indicate a gently sloping valley system, generally falling in a south easterly direction. The highest ground levels are in the northwestern area of the site at around 58.45 mAOD and decline to around 50.32 mAOD along the western boundary of the site.

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

The site forms a shallow basin enclosed by higher ground to the north, east and south, creating a natural slope towards the west of the site where an ordinary watercourse is present.

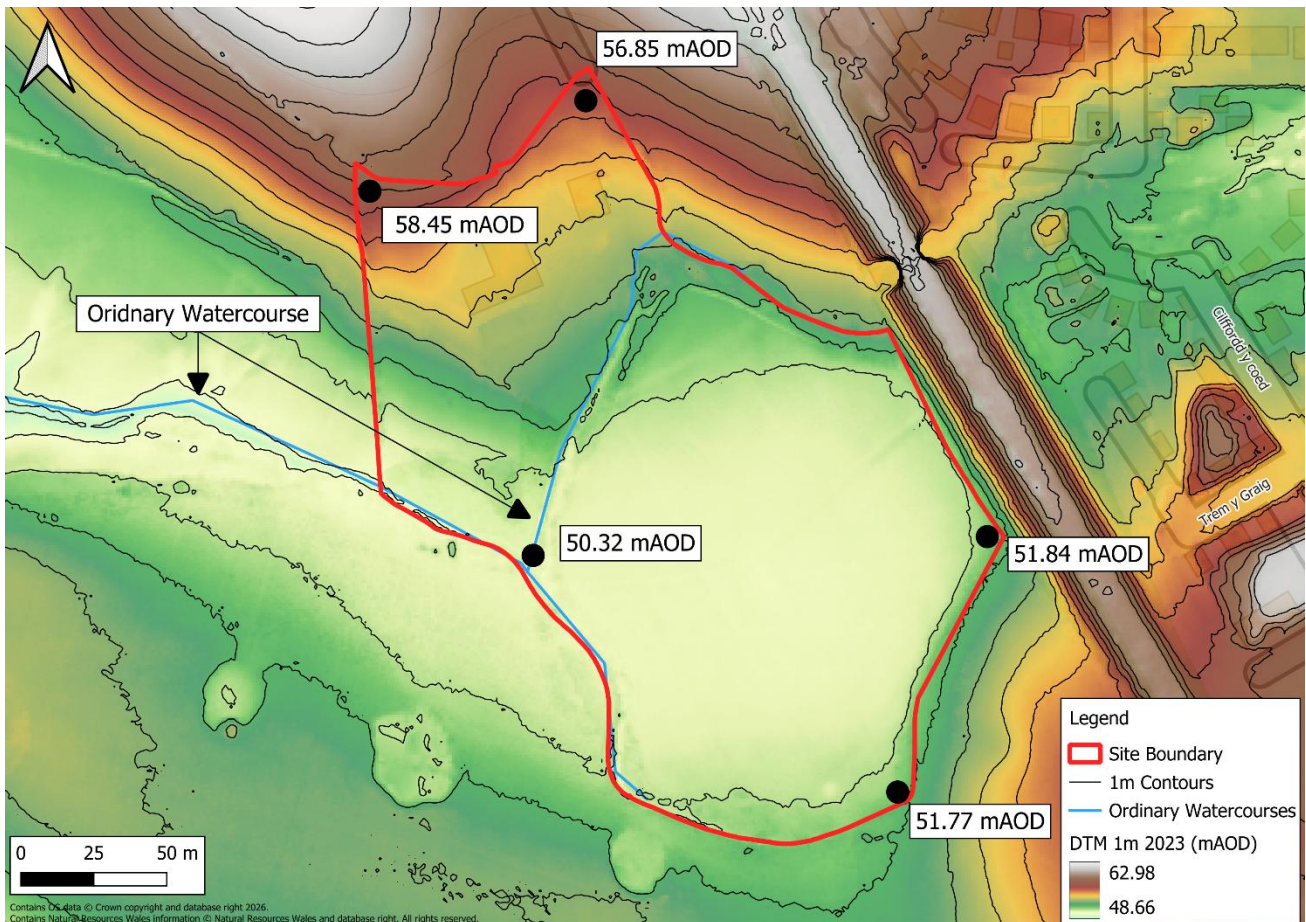


Figure 2-2 1m LiDAR

2.3 Watercourses and Flood Defences

Figure 2-3 shows the presence of two ordinary watercourses that cross through the site.

One flows from north east to west through the northern vicinity of the site, and the second flows in a northerly direction from the south west of the site. Once they converge along the western boundary the watercourse flows in a general westerly direction, before discharging into the Nant Henstaff, an ordinary watercourse located ~0.77km to the west of the site.

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

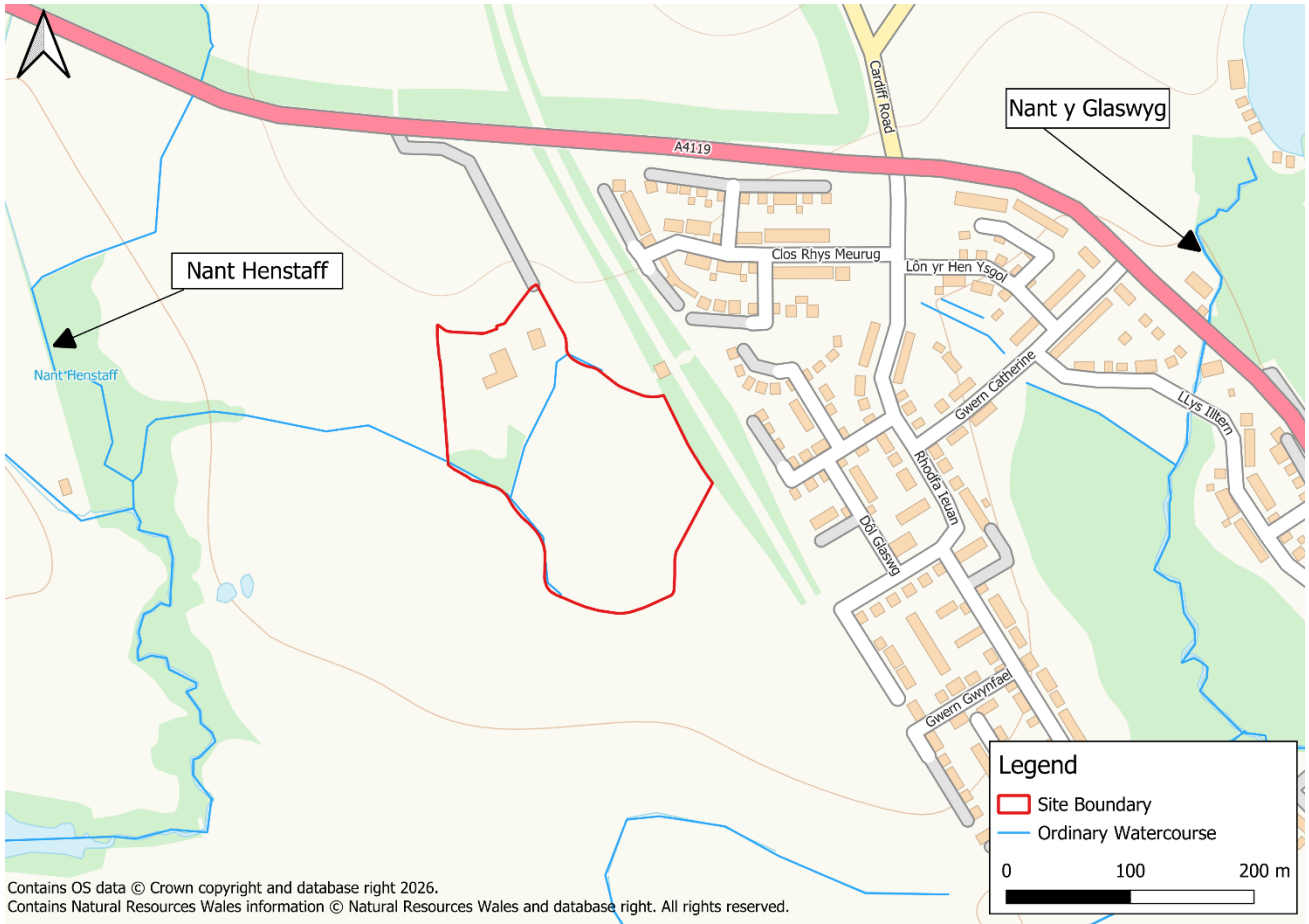


Figure 2-3 Watercourses and Flood Defences

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	Mixed use - Residential, community and employment
Form of Development	New Development
Vulnerability Classification	Highly and Less Vulnerable
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 Zones 1, 2 and 3 - shown in Figure 3-1



Figure 3-1 Flood Map for Planning - Flood Risk from 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 are summarised in Table 4-1.

Table 4-1 Summary of flood risk

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	x	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	x	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 predominantly at low risk of surface water flooding. See Section 4.1 for further assessment.
Flood Risk from Groundwater	x	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	x	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 that there have been 14 sewer incidents within the Pentyrch and St Fagans Electoral District. However, the site is greenfield and is unlikely to have any sewerage infrastructure which could overflow and cause sewer flooding. Therefore, it is concluded that the risk of flooding is 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 almost all of the site is located within Flood Zone 1. Flood Zones 2 and 3 are present within the south of the site, in an area of localised flooding, and in the west - adjacent to the ordinary watercourse.

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

As shown in Figure 4-1, during the 1% AEP plus climate change event, almost the entire site is shown to remain flood-free. A small, localised area of flooding, associated with a topographic depression is shown in the south of the site, within which flood depths of up to 200mm are predicted.

During the 0.1% AEP plus climate change event, Figure 4-2 shows that the flood extent in the centre of the site increases, with flood depths of up to 230mm predicted. There is some additional flooding predicted located along the west of the site boundary that is associated with the small ordinary watercourse. Flood depths of up to 290mm are predicted in this area, associated with the channel.

Flood free access can be obtained via the north of the site onto an unnamed road which connects to the A4119.



Figure 4-1 Flood Risk from Small Watercourses- 1% AEP + Climate Change - Flood Depths



Figure 4-2 Flood Risk from Small Watercourses- 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.

The development site is predominantly located within Flood Zone 1 for surface water and small watercourses. A small area of the site is shown to be located within Flood Zones 2 and 3, associated with a topographic depression, and the presence of an ordinary watercourse along the western boundary.

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)

It is recommended that watercourses within the site are retained, and that development within its associated floodplain is avoided. Any crossings over an ordinary watercourse will require Ordinary Watercourse Consent and should be designed to minimise the impact on the watercourse and risks associated with a potential blockage.

Surface water ponding is associated with a localised topographic depression on site which is likely to be managed through good site design and a natural change in ground levels to facilitate development. It is likely that surface water flood risk can be managed through good site design and a comprehensive surface water management strategy, utilising SuDS techniques, in line with the Statutory Standards for SuDS in Wales.

Flood free access can be obtained via the north of the site onto an unnamed road which connects to the A4119.

Given the presence of the site within Flood Zone 2 for surface water and small watercourses, it is considered that a full FCA may not be required. Instead, flood risk can be appropriately addressed through a comprehensive Flood Risk and Surface Water Drainage Strategy to support the planning application.

6 Summary and recommendations

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

The site is predominantly located within Flood Zone 1 for surface water and small watercourses, with confined areas of the site located 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. However, given the nature and scale of flood risk at the site, it is considered that flood risk can be appropriately addressed through a comprehensive Flood Risk and Surface Water Drainage Strategy.

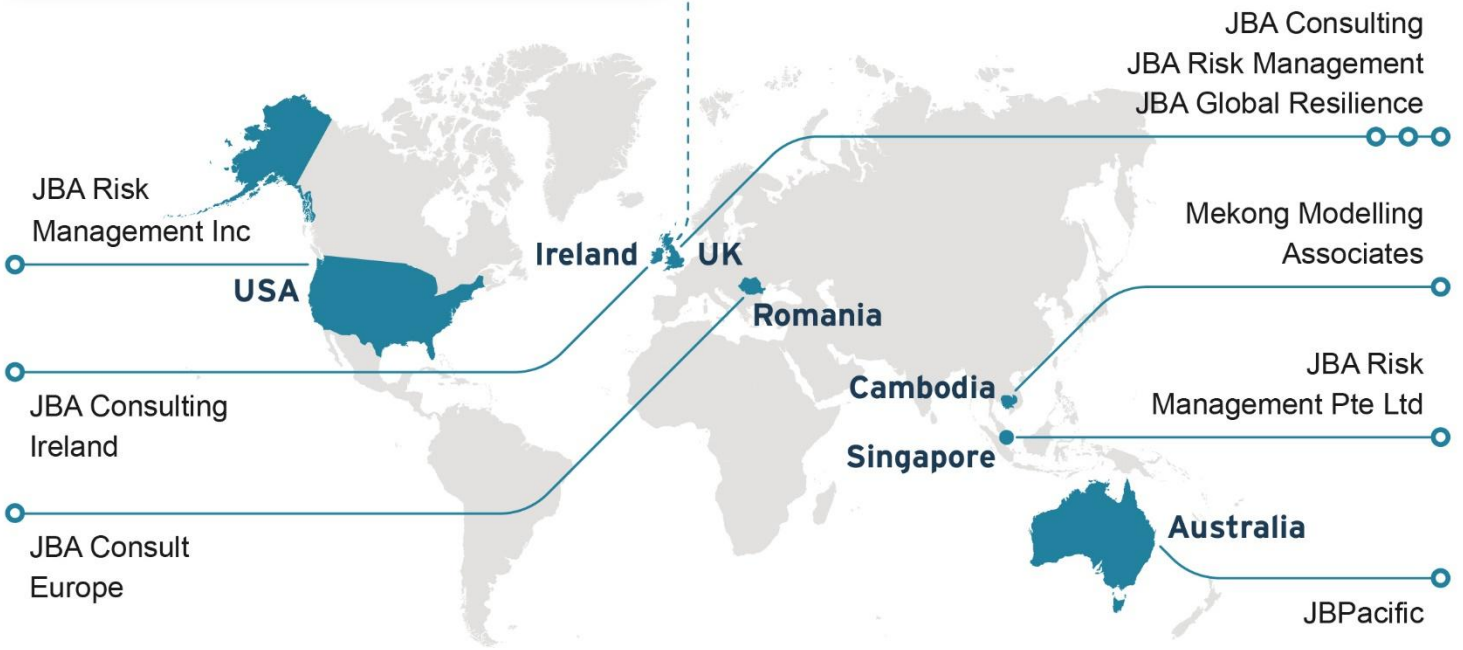
It is therefore considered that this site is likely to satisfy the requirements of TAN-15, subject to the following recommendations:

- 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. Given the small extent of flooding, it is envisaged that a Flood Risk and Surface Water Drainage Strategy which demonstrates how the proposals meet the requirements of TAN-15 and the Statutory Standards for SuDS in Wales would be sufficient.
- A sequential approach to site masterplanning should be taken.
- All watercourses within the site should be retained and development within their associated floodplains avoided, with the exception of crossing points and water compatible development.
- Any crossings over an ordinary watercourse will require Ordinary Watercourse Consent and should be designed to minimise the impact on the watercourse and risks associated with a potential blockage.
- Opportunities to enhance the existing watercourse corridor through blue green infrastructure and biodiversity enhancements should be explored .



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Registered Office
 1 Broughton Park
 Old Lane North
 Broughton
 SKIPTON
 North Yorkshire
 BD23 3FD
 United Kingdom

+44(0) 1756 799919
 info@jbaconsulting.com
 www.jbaconsulting.com

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 Associates Limited
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 3246693

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