

Level 1 SFRA - Functional Floodplain (Flood Zone 3b) Guidance

Final Report

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Prepared by	Sarah Hambling BSc MSc Analyst
Reviewed by	Gavin Hodson BSc FdSc MCIWEM C.WEM Technical Lead
Authorised by	Joanne Chillingworth BSc MSc MCIWEM C.WEM Associate Director

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Contract

JBA Project Manager	Sarah Hambling
Address	1 Broughton Park, Old Lane North, Broughton, Skipton, North Yorkshire, BD23 3FD
JBA Project Code	2023s1143

This report describes work commissioned by Wyre Council by an instruction dated 2 September 2024. The Client's representative for the contract was George Briscoe of Wyre Council. Sarah Hambling of JBA Consulting carried out this work.

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Abbreviations

AEP	Annual Exceedance Probability
EA	Environment Agency
FMfP	Flood Map for Planning
FRA	Flood Risk Assessment
JBA	Jeremy Benn Associates
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
PPG	Planning Practice Guidance
SFRA	Strategic Flood Risk Assessment

Definitions

1D model: one-dimensional hydraulic model

2D model: two-dimensional hydraulic model

Annual Exceedance Probability: the probability (expressed as a percentage) of a flood event occurring in any given year.

Flood Map for Planning: The EA Flood Map for Planning (Rivers and Sea) is an online mapping portal which shows the Flood Zones in England. The Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences and do not account for the possible impacts of climate change.

Flood Risk Assessment: a site-specific assessment of all forms of flood risk to the site and the impact of development of the site to flood risk in the area.

Fluvial Flooding: Flooding resulting from water levels exceeding the bank level of a river (main river or ordinary watercourse).

Tidal Flooding: Temporary inundation of low-lying land during exceptionally high tide events.

1 Introduction

1.1 Overview

Wyre Council commissioned JBA Consulting to produce this Technical Note to provide further guidance on the interpretation of functional floodplain within the Fylde Coast Authorities Level 1 Strategic Flood Risk Assessment (SFRA) (2024).

The aims of this report are as follows:

- Provide further clarity for developers on the differences between 'Modelled Flood Zone 3b' and 'Indicative Flood Zone 3b' as set out in the Level 1 SFRA.
- Provide guidance for developers on how to apply and interpret 'Indicative Flood Zone 3b'.
- Signpost developers to relevant guidance for undertaking site-specific Flood Risk Assessments (FRAs).
- Provide worked examples to assist developers in interpreting 'Indicative Flood Zone 3b'.

1.2 Relevant documentation and guidance

The following documentation and guidance should be referred to alongside this report:

- [Fylde Coast Authorities Level 1 SFRA \(2024\) \(wyre.gov.uk\)](https://www.wyre.gov.uk)
 - [Main Report \(wyre.gov.uk\)](https://www.wyre.gov.uk) - includes guidance for developers on using the information in the SFRA.
 - [Appendix A: User Guide \(wyre.gov.uk\)](https://www.wyre.gov.uk) and [GeoPDF Maps \(wyre.gov.uk\)](https://www.wyre.gov.uk) - shows the SFRA Flood Zones across the study area, detailed within the user guide.
 - [Appendix B: Data Sources \(wyre.gov.uk\)](https://www.wyre.gov.uk) - details the data sources used to produce the SFRA, including available hydraulic modelling.
- [Flood risk assessments: applying for planning permission \(www.gov.uk\)](https://www.gov.uk) - Environment Agency (EA) guidance for developers on when an FRA is required, how an FRA should be complete, and what happens next.
- [Planning Practice Guidance \(PPG\): Flood risk and coastal change \(www.gov.uk\) \(Paragraph 80 Reference ID: 7-080-20220825\)](https://www.gov.uk) - a checklist for developers on what must be included within a site-specific FRA.

2 Functional Floodplain (Flood Zone 3b)

The following section provides an overview of what is meant by functional floodplain (Flood Zone 3b), details the difference between Modelled Flood Zone 3b and Indicative Flood Zone 3b, and the process that developers need to undertake in interpreting and applying the functional floodplain.

2.1 What is functional floodplain?

[PPG: Flood risk and coastal change \(www.gov.uk\)](https://www.gov.uk/guidance/ppg-flood-risk-and-coastal-change) (Paragraph 78 Reference ID:7-708-20220825) defines functional floodplain (Flood Zone 3b) as land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:

- land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
- land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Local Planning Authorities (LPAs) should identify in their SFRA areas of functional floodplain and its boundaries accordingly, in agreement with the EA. Flood Zone 3b is not distinguished from Flood Zone 3a in the [EA Flood Map for Planning \(FMfP\) Flood Zone 3 \(data.gov.uk\)](https://data.gov.uk/dataset/ea-flood-map-for-planning-fmfp-flood-zone-3).

2.2 Modelled and Indicative Flood Zone 3b

The [Fylde Coast Authorities Level 1 SFRA \(2024\) \(wyre.gov.uk\)](https://wyre.gov.uk/level-1-sfra-2024) defines two areas of functional floodplain in agreement with the EA and can be seen on this [Wyre Interactive Map \(wyre.maps.arcgis.com\)](https://wyre.maps.arcgis.com/):

- Modelled Flood Zone 3b
- Indicative Flood Zone 3b

2.2.1 Modelled Flood Zone 3b

Modelled Flood Zone 3b defines the functional floodplain across the SFRA study area, where detailed hydraulic modelling from the EA was available, and takes precedence over Indicative Flood Zone 3b.

In agreement with the EA, the 3.3% AEP defended modelled flood extents were used to represent Flood Zone 3b where available. For areas covered by detailed models, but with no defended 3.3% AEP output available, the 3.3% AEP undefended or 2% AEP defended outputs were used as the 'next best' available outputs as a conservative proxy.

[Appendix B: Data Sources \(wyre.gov.uk\)](#) lists the model outputs incorporated within the Modelled Flood Zone 3b extent and shows the extents of the available hydraulic models.

For areas not covered by detailed hydraulic models a precautionary approach has been adopted for Flood Zone 3b with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a (1% AEP) (Indicative Flood Zone 3b, see Section 2.2.2).

2.2.2 Indicative Flood Zone 3b

Indicative Flood Zone 3b shows the same extent as Flood Zone 3a as defined within the SFRA. This extent is likely to be the same as the EA FMfP Flood Zone 3 in most locations; however, the EA's online FMfP is likely to be updated more regularly than the SFRA so may show more up-to-date information in some locations.

Indicative Flood Zone 3b should only be used in the absence of detailed modelling (i.e. Modelled Flood Zone 3b).

2.3 Interpreting Flood Zone 3b

If the SFRA indicates that a site falls within the Indicative Flood Zone 3b extent, the following steps should be taken by applicants:

1. Identify if there is existing detailed modelling available for the site.

- Appendix B: Data Sources provides an indication as to whether there was detailed modelling available at the time of publication; however, developers should always request the latest modelled data from the EA in case any more recent modelling is available to inform the assessment.
- The [EA FRA for Planning Applications \(gov.uk\)](https://www.gov.uk/guidance/ea-fra-for-planning-applications) provides guidance for developers on identifying the required information and using the [EA FMfP Service \(gov.uk\)](https://www.gov.uk/guidance/ea-fmfP-service) to request this data.

2. Identify refined Flood Zone 3b extent

- The Indicative Flood Zone 3b extent is intended as a screening tool to highlight areas where the functional floodplain may be poorly defined.
- If detailed modelling is already available for the site, developers should use the 3.3% AEP defended extent to check if their site falls within the functional floodplain.
 - In the absence of the 3.3% AEP extent, a higher exceedance event (such as the 2% or 1.3% AEP) may be used to show that the site does not fall within the functional floodplain. However, if the site is impacted by these larger return periods further work must be undertaken by the applicant to refine the functional floodplain extent (i.e. re-running the model for the 3.3% AEP event).
- If no detailed modelling is available, it is the responsibility of the applicant to define functional floodplain as part of a site-specific FRA to the satisfaction of the LPA.

Figure 2-1 sets out the process that developers should follow to interpret Flood Zone 3b.

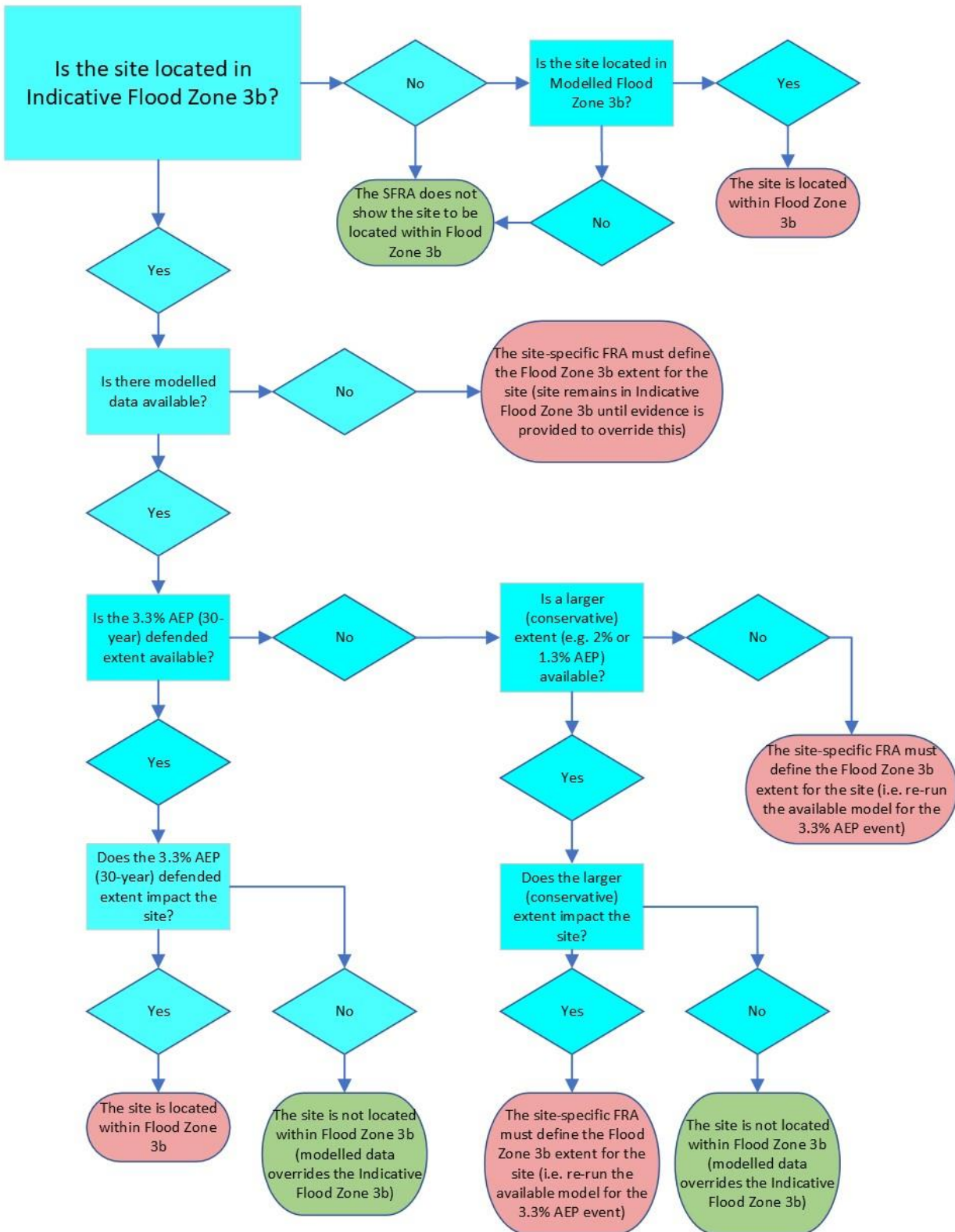


Figure 2-1: Flowchart showing how to interpret Indicative Flood Zone 3b.

2.3.1 Refining Flood Zone 3b as part of a site-specific FRA

As set out in the [EA's FRAs: applying for planning permission \(www.gov.uk\)](http://www.gov.uk):

'In some cases, SFRA's may not hold suitable information for your site on future flood risk or functional floodplain. In such cases, your FRA will need to provide suitable information.'

If the site is identified within Indicative Flood Zone 3b within the SFRA, there may be some cases where, after following the process set out in Figure 2-1, the developer must provide suitable information within a site-specific FRA.

As set out in [PPG: Flood Risk and Coastal Change \(gov.uk\)](http://gov.uk) (Paragraph 21 Reference ID: [7-021-20220825](http://gov.uk)) 'A flood risk assessment needs to be appropriate to the scale, nature, and location of the development'. The LPA will generally require a more detailed assessment for a new development with a large number of houses than an extension to an existing house.

It is up to the LPA, and the EA when required, to be satisfied that they can reach an informed decision on the planning application. Examples of evidence used to refine Flood Zone 3b may include:

- 1) New detailed 1D-2D hydraulic modelling assessment of any watercourses within and/or affecting the site.
 - 1.1) This is generally the costliest option with the largest timescales, but is likely to be required for large, vulnerable developments in high risk areas.
- 2) Strategic 2D hydraulic modelling assessment of any watercourses affecting the site.
 - 2.1) This is a less costly and quicker option than a full detailed 1D-2D hydraulic model. It could be used to define a Flood Zone 3b extent where the flood risk from a watercourse is anticipated to be low.
- 3) Use of the [EA's Risk of Flooding from Surface Water map \(gov.uk\)](http://gov.uk) data to infer the fluvial risk from small watercourses and drains.
 - 3.1) This option utilises existing open data available from the EA and may be suitable for predicting the flood risk from small watercourses for small developments. However, there are limitations to this method as the maps do not explicitly model the conveyance effect of ordinary watercourses or drainage channels. Structures (such as bridges, culverts, and weirs) and flood risk management infrastructure (such as defences) are also not represented.

Where new hydraulic models are produced as part of an application, it should be noted that a detailed hydraulic model review will be required by the EA. The EA will not accept the findings of a site-specific FRA based on third party hydraulic modelling without testing and acceptance of the evidence base through a formal review. This is likely to be a lengthy process and costly to the applicant. The EA advise that pre-application hydraulic model reviews are preferable to post-application reviews, due to the timescales involved which would otherwise not be aligned with the aspiration determination period for an application.

3 Examples

The following section provides three worked examples, illustrating sites within different locations and how to interpret functional floodplain at each site.

Text highlighted in blue informs the actions that should be taken at each stage of the process.

Please note these examples are specifically focused on the risk from fluvial and tidal functional floodplain at the sites and do not consider any additional sources of flood risk.

3.1 Example 1 - Tidal Wyre, Hambleton

3.1.1 Location

This site is located to the south of Hambleton and is within close proximity of the River Wyre (approximately 280m east). This site has been identified within the SFRA as lying wholly within the Indicative Flood Zone 3b extent (Figure 3-1).

3.1.2 Next steps

The following steps should be taken to identify Flood Zone 3b at this site.

Use the SFRA Appendix A and Appendix B to identify the flood risk to the site and assess the model availability for the site.

The flood risk to this site is noted to be from the River Wyre.

Appendix A shows that there is a Modelled Flood Zone 3b extent along the River Wyre in this location. Appendix B shows the model extent that covers this area is the Tidal Wyre hydraulic model.

Contact the EA for the latest hydraulic model data from the site.

The EA will provide the Tidal Wyre hydraulic model.

Check the Modelled 3.3% AEP extent.

The Modelled 3.3% AEP extent is not shown to affect the site (Figure 3-1).

The Modelled Flood Zone 3b extent overrides the Indicative Flood Zone 3b extent, therefore, the site is confirmed not to lie within the functional floodplain.

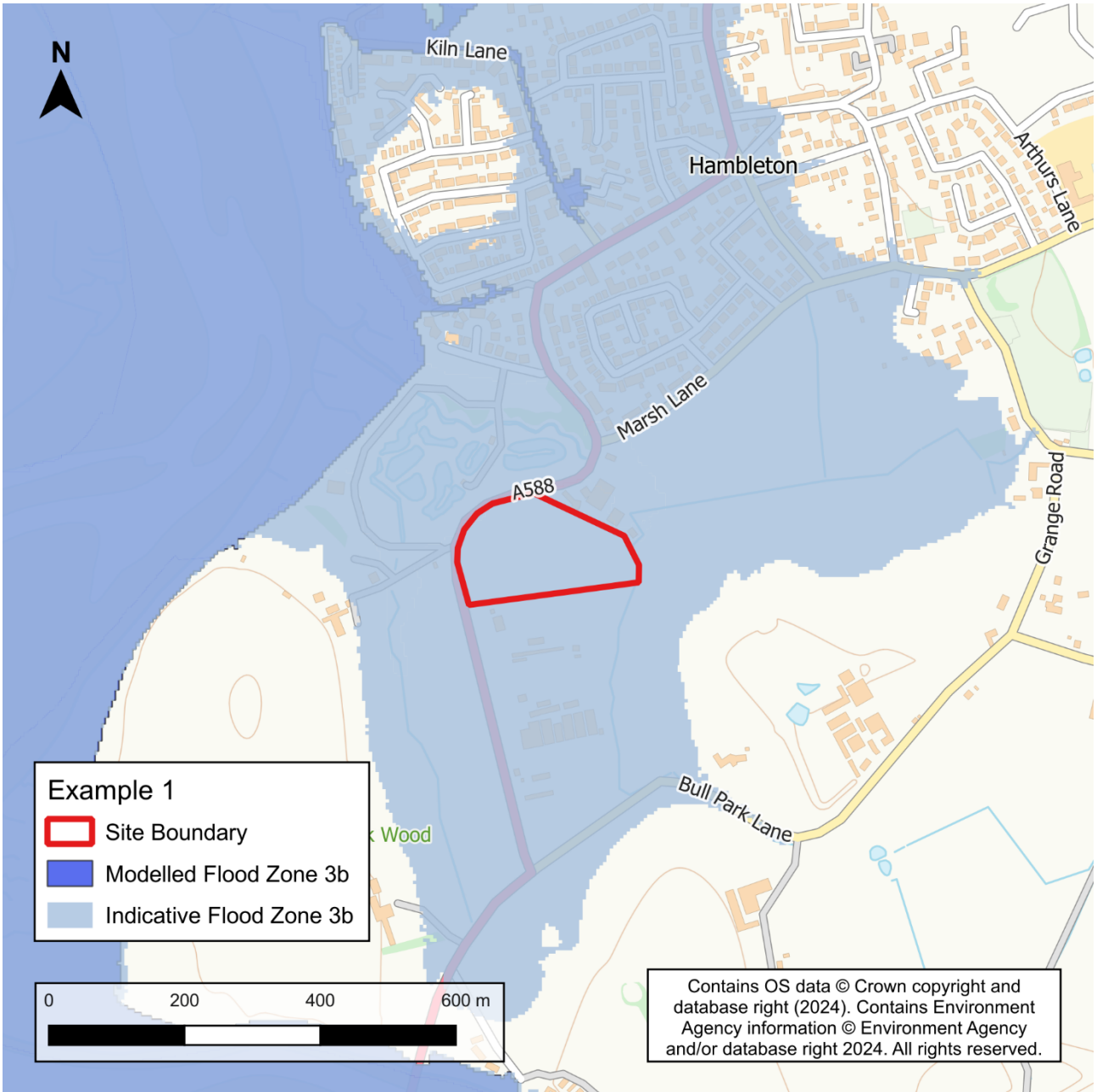


Figure 3-1: Example 1 - Indicative and Modelled Flood Zone 3b extents.

3.2 Example 2 - Tidal Lune and Pilling Brook, Pilling

3.2.1 Location

This site is located to the south east of Pilling. Pilling Brook runs along the southern boundary of the site. This site has been identified within the SFRA as lying almost wholly within the Indicative Flood Zone 3b extent (Figure 3-2).

3.2.2 Next steps

The following steps should be taken to identify Flood Zone 3b at this site.

Use the SFRA Appendix A and Appendix B to identify the flood risk to the site and assess the model availability for the site.

There are noted to be two sources of flood risk to this site: tidal risk and fluvial risk from Pilling Brook.

Appendix A shows that there is a Modelled Flood Zone 3b extent in this location. Appendix B shows the model extent that covers this area is the Tidal Lune and Pilling Brook hydraulic models.

Contact the EA for the latest hydraulic model data from the site.

The EA will provide the Tidal Lune and Pilling Brook hydraulic models.

Check the Modelled 3.3% AEP extent.

The Modelled 3.3% AEP extent from the Tidal Lune is not shown to affect the site; however, the Modelled 3.3% AEP extent from Pilling Brook is shown to affect the east side of the site (Figure 3-2).

The Modelled Flood Zone 3b extent overrides the Indicative Flood Zone 3b extent, so Flood Zone 3b extent at the site is refined; however, the eastern portion of the site is shown to lie within the functional floodplain and potential development would be limited within this area to Essential Infrastructure and Water Compatible uses compliant with [Table 2 of the PPG: Flood Risk and Coastal Change \(gov.uk\) \(Paragraph: 079 Reference ID: 7-079-20220825\)](#).

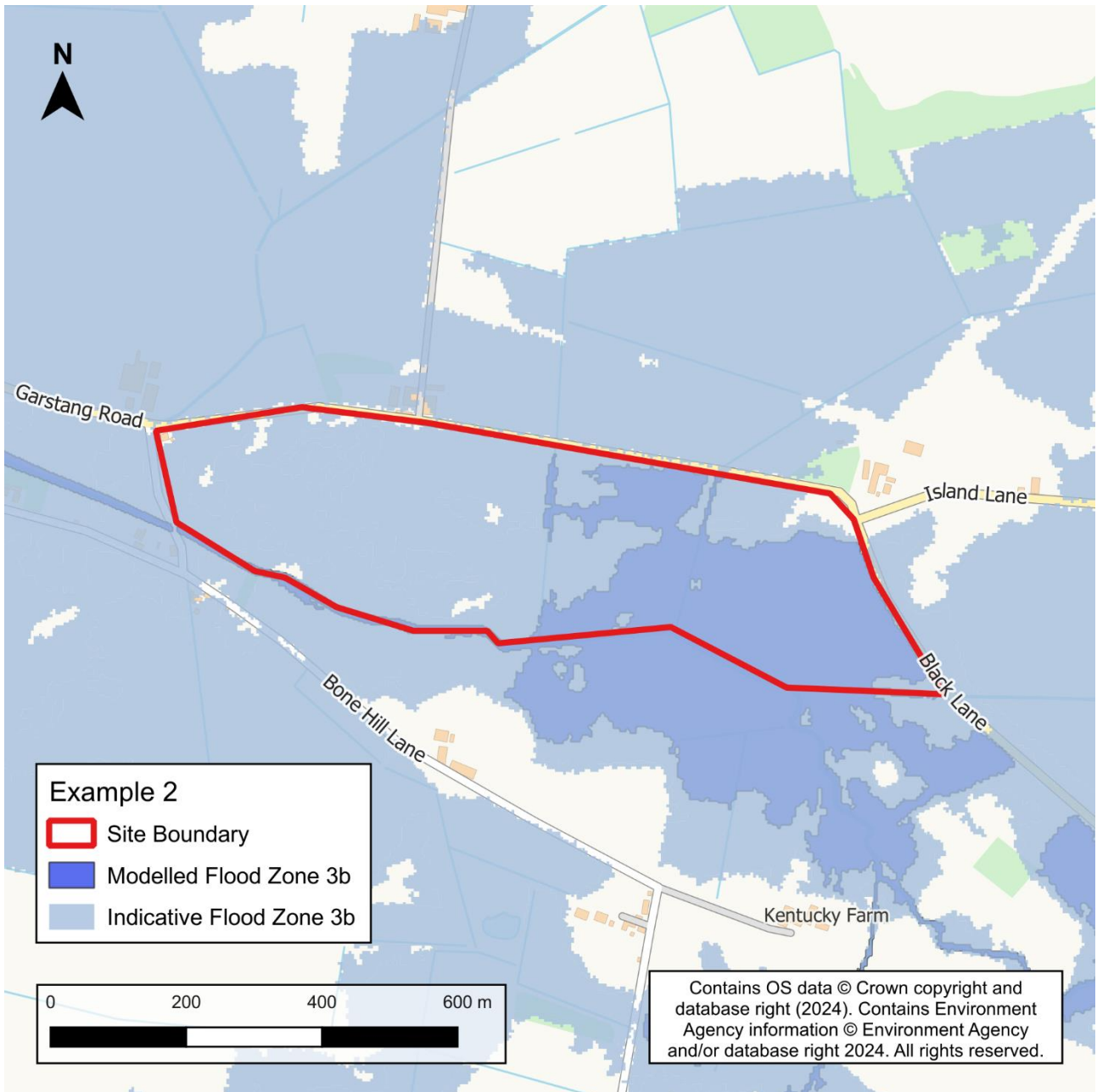


Figure 3-2: Example 2 - Indicative and Modelled Flood Zone 3b extents.

3.3 Example 3 - River Calder, Catterall

3.3.1 Location

This site is located to the north east of Catterall. The River Calder runs along the northern boundary of the site. This site has been identified within the SFRA as lying almost wholly within the Indicative Flood Zone 3b extent (Figure 3-3).

3.3.2 Next steps

The following steps should be taken to identify Flood Zone 3b at this site.

Use the SFRA Appendix A and Appendix B to identify the flood risk to the site and assess the model availability for the site.

This site is noted to be at fluvial flood risk from the River Calder.

Appendix A does not show a Modelled Flood Zone 3b extent in this location and Appendix B confirms that there were no models available for the River Calder in this area at the time that the SFRA was produced.

Contact the EA for the latest hydraulic model data from the site.

There are two scenarios for this site:

1. The EA provide a hydraulic model for the River Calder which has been produced more recently than the SFRA.
2. The EA response details that they do not hold any hydraulic modelling for the area of interest.

For Scenario 1: Check the Modelled 3.3% AEP extent.

If there is an existing hydraulic model available for the site, then the 3.3% AEP extent should be used to confirm whether the site lies in Modelled Flood Zone 3b or not. The modelled extent will override the Indicative Flood Zone 3b extent.

For Scenario 2: Refine the 3.3% AEP extent as part of the site-specific FRA.

If the EA response details that there are currently no available hydraulic models covering the area of interest, then the developer will need to establish the 3.3% AEP extent as part of the site-specific FRA.

The developer should consult with the LPA, LLFA, and EA if required to determine the requirements for the site-specific FRA.

In this location, given the considerable flood risk to the site, it is likely that the developer would be required to develop a detailed hydraulic model to understand the flood risk to the site and refine the functional floodplain extent.

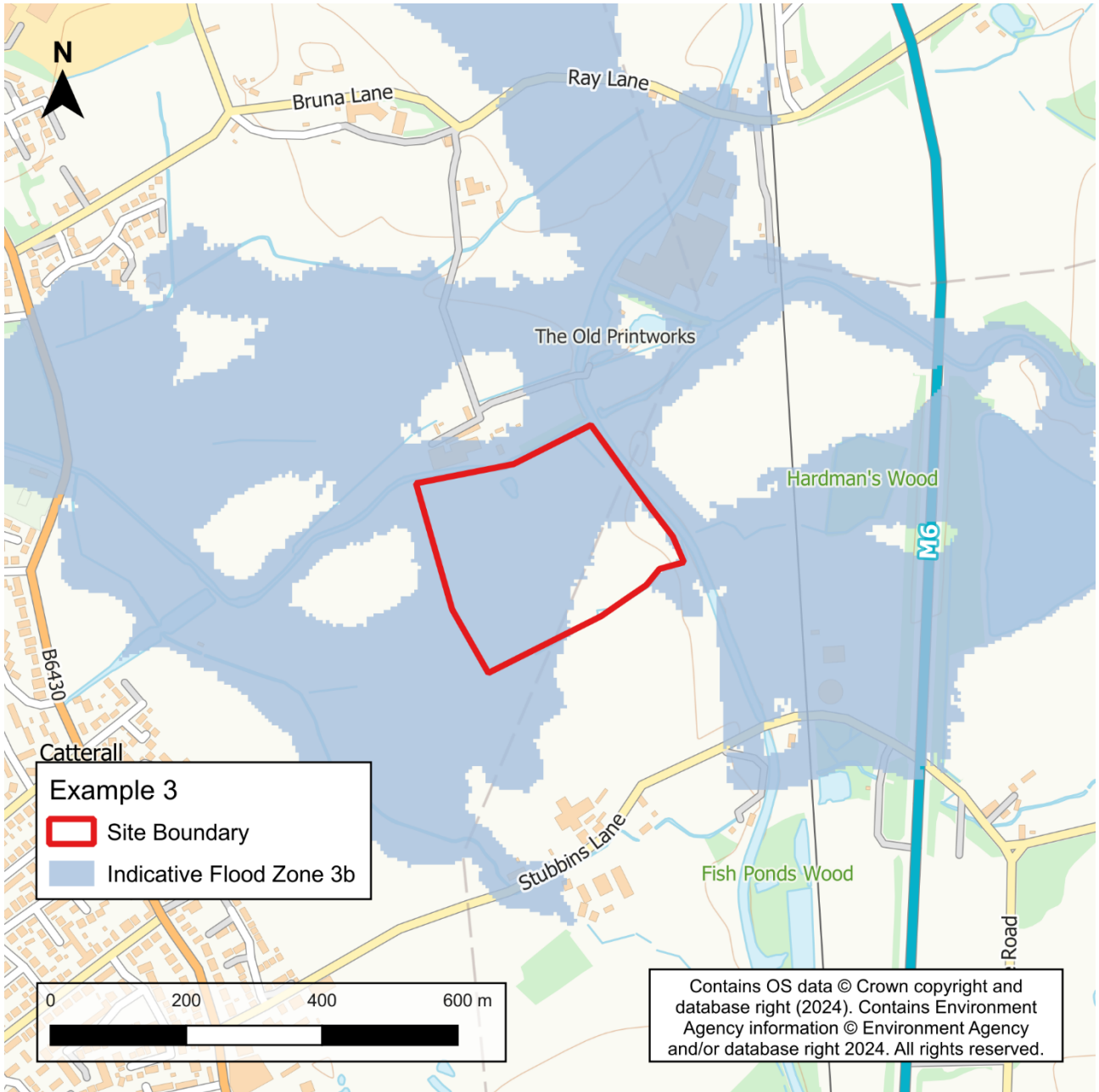


Figure 3-3: Example 3 - Indicative and Modelled Flood Zone 3b extents.

Offices at

Bristol
Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Leeds
Limerick
Newcastle upon Tyne
Newport
Peterborough
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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
Follow us:  

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