

NOTE TO FILE

JBA Project Code 2018s0603
Contract Wirral Level 1 SFRA
Lead Client Wirral Council
Day, Date and Time 3rd July 2018
Author Rachel Bryan
Reviewer Mike Williamson
Subject Functional Floodplain Update



1 Introduction

The functional floodplain (Flood Zone 3b) has been updated from the previous 2009 SFRA using the most up-to-date data available. The following methodology note explains how the 2009 functional floodplain has been updated. The LPA, LLFA and EA must all agree on the extent of the functional floodplain outline and the methodology used. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. The local knowledge of the council and EA is therefore crucial in defining the functional floodplain as robustly as possible.

2 Functional floodplain definition

2.1 Flood Risk and Coastal Change PPG – Table 1, Paragraph 065

The Flood Zones, referred to in the table below, show the probability of river and sea flooding, ignoring the presence of defences. Flood zones 1, 2 and 3 are included within the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#). Flood Zone 3b is the functional floodplain and is not included in the Flood Map. This zone is for the use of LPAs and developers. Flood Zone 3a is Flood Zone 3 of the Flood Map that isn't functional floodplain.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

2.2 Flood Risk and Coastal Change PPG – Paragraph 015

The definition of Flood Zone 3b in Table 1 explains that local planning authorities should identify areas of functional floodplain in their Strategic Flood Risk Assessments in discussion with the Environment Agency

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and the lead local flood authority. The identification of functional floodplain **should take account of local circumstances and not be defined solely on rigid probability parameters**. However, land which would naturally flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood (such as a flood attenuation scheme) in an extreme (0.1% annual probability) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

A functional floodplain is a very important planning tool in making space for flood waters when flooding occurs. Generally, development should be directed away from these areas using the Environment Agency's catchment flood management plans, shoreline management plans and local flood risk management strategies produced by lead local flood authorities.

The area identified as functional floodplain **should take into account the effects of defences** and other flood risk management infrastructure. Areas which would naturally flood, but which are prevented from doing so by existing defences and infrastructure or solid buildings, will not normally be identified as functional floodplain. If an area is intended to flood, e.g. an upstream flood storage area designed to protect communities further downstream, then this should be safeguarded from development and identified as functional floodplain, even though it might not flood very often.

3 2009 functional floodplain

Text taken from the 2009 Level 1 SFRA Update:

This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which could flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at any other probability to be agreed between the LPA and the Environment Agency, including water conveyance routes). For the purpose of the Wirral Council SFRA, in Zone 3b, developers and local authorities should seek opportunities to:

- Reduce the overall level of flood risk in the area through the layout and form or the development and the appropriate application of sustainable drainage techniques; and
- Relocate existing development to land with a lower probability of flooding.

4 Functional floodplain update

Based on the above guidance and definitions provided in the FRCC-PPG:

The following datasets have been interrogated to update the 2009 functional floodplain for Wirral:

- Wirral Tidal 2015 model (undefended 30-year outlines)
- Birket, Fender and Arrowe Brook Fluvial 2011 (undefended 20-year outlines)
- Dibbinsdale Brook 2010 (undefended 20-year outlines)
- EA's Flood Map for Planning Flood Zone 3 (April 2018)
- Functional Floodplain from previous SFRA (2009)
- EA Flood Storage Areas (FSA) – none present in Wirral
- EA Areas Benefitting from Defences (ABD) (April 2018)
- EA Historic Flood Map (HFM) (April 2018)
- EA Recorded Flood Outlines (RFO) (April 2018)
- Urban areas - OSOpenMapLocal_Raster (to remove existing developed areas and transport infrastructure from functional floodplain)

4.1 GIS methodology

- The existing 2009 functional floodplain provided a starting point for review.
- The HFM / RFO datasets were used to update the 3b outline for historically fluvially flooded areas.
- The Wirral Tidal 2015 undefended 30 year MFO, Birket, Fender and Arrowe Brook Fluvial 2011 undefended 20-year MFO and Dibbinsdale Brook 2010 (undefended 20-year outlines) were used to update the 3b outline for these areas. The outlines for Wirral Tidal 2015 model and Birket,

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Fender and Arrowe Brook fluvial 2011 model are identical to each other, however both are included in the attribute table within the FZ3b shapefile to provide the extents of fluvial and tidal risks.

- Checks on the geometry of the 3b outline were carried out to ensure geometric correctness of the outline
- Along areas of Clatter Brook and Raby Mere, where 20 or 25-year modelled flood outlines were unavailable, we have used the previous 3b outline / Flood Zone 3 (April 2018), which MFOs for are identical in this area along the watercourses. ('Previous 2009 FZ3b / Flood Zone 3 (April 18)' in the attribute table within the shapefile).
- The previous 3b outline was also used in a number of areas, including Hoylake on part of Municipal Golf Course, west of Greasby and the M53 Moreton Spur Junction where outlines for Flood Zone 3 and 20 or 25-year MFOs were unavailable. With reference to the 2009 SFRA Technical Note, the explanations provided for the three locations inclusion in the functional floodplain still remain valid and therefore are still included within this update (See Section 4.1.1) **(Agreed by Wirral Council 12th July 18)**
- The current Flood Zone 3 (April 2018) was used to update the 2009 functional floodplain along areas of Greasby Brook, as there were a number of discrepancies where the previous 3b outline extents exceeded Flood Zone 3 extents, however according to the EA there are no existing outlines for this area (although a new model is planned for this watercourse but is unavailable until the end of 2018). Flood Zone 3 has also been used for areas of The Birket east of Wallasey Bridge Road to the River Mersey. **EA (Graham Todd) and WC (John Entwistle) have confirmed the use of Flood Zone 3 where the previous 3b outline exceeds FZ3 (email dated 5th July 18).**
- The Areas Benefiting from Defences dataset was used to erase areas of the previous 3b outline along The Birket and Fender as well as Newton and Arrow Brook.
- The OS Open Data OSOpenMapLocal_Raster Dataset was used to identify urban areas and transport infrastructure to be removed from the functional floodplain.
- Any polygons under 0.03ha were removed as this will not have an impact on development potential due to their small area.
- Internal JBA review of draft outline.

4.1.1 2009 Functional Floodplain Technical Note explanations

Hoylake, Municipal Golf Course

'The functional floodplain envelope shown on the Municipal Golf Course is not shown to flood directly from the River Birket. However this area is very low lying and contains a large drainage network therefore it was judged appropriate to extrapolate the 4% AEP maximum stage level of 4.89m from the most upstream modelled node on the Birket over this area. This also highlights a possible surface water flooding issue in this area'

M53 Moreton Spur Junction 'F'

'Envelopes marked 'D', 'E' and 'F' are considered a consequence of drainage paths under the M53.'

West of Greasby

'There is an area on Greasby Brook, just south of Greasby, where the modelling has produced quite an extensive area of potential functional floodplain. FZ3 does not cover this area however the modelling from the Morpeth and Birket Study does; therefore, the decision was taken to map the functional floodplain for this area.'

Table 2 Functional floodplain data sources

Watercourse	Extent	Data Source
The Birket	Hoylake Municipal Golf Course	Previous FZ3b

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The Birket, Arrowe Brook, The Fender, Prenton Brook	Hoyle Municipal Golf Course to Wallasey Bridge Road, Arrowe Brook, The Fender, Prenton Brook	Birket, Fender and Arrowe Brook Fluvial 2011 model (20 year undefended outlines)
	Hoyle Municipal Golf Course to Wallasey Bridge Road, Arrowe Brook (to Sycamore Close), The Fender (to Neville Close / before Noctorum).	Wirral Tidal 2015 model (30 year undefended outlines)
Arrowe Brook	Small area south of Thingwall Road	Historic Flood Map
Prenton Brook	Two small areas around Brookway	Historic Flood Map
The Fender	Small area east of M53 and south of Hoyle Road / A553)	Historic Flood Map
Greasby Brook	Area around Irbyside Cottages / North of Hill Bark Farm, south of Frankby Road / B5139	Previous FZ3b
Greasby Brook	At the confluence with Arrowe Brook to just south of Frankby Road / B5139 and East of Frankby Stiles	Flood Zone 3
Dibbinsdale Brook	From the confluence of Clatter Brook and Dibbinsdale Brook at Raby Mere, North to the River Mersey and South to Lowfields Avenue	Dibbinsdale Brook 2010 model (20 year undefended outlines)
Clatter Brook	From Thornton Common Road to Dibbinsdale Brook Confluence	Previous FZ3b / Flood Zone 3
Clatter Brook	East of Whitehouse Farm to north of Thornton Common Road	Previous FZ3b / Flood Zone 3
Raby Mere	West of Blakeley Road, west across M56 to south of Raby Hall Road and south of Thornton Farm Coach House	Previous FZ3b / Flood Zone 3

The extent of the functional floodplain outline produced from this SFRA should always be assessed in greater detail where any more detailed study such as a Level 2 SFRA or site-specific FRA are undertaken.

5 Considerations for the EA, LPA and LLFA review

The functional floodplain outline should be assessed by the LPA, LLFA and the EA and any comments or questions should be referred back to JBA in order to agree on a final outline. The following should be considered in review:

- Check the areas of HFM that have been included and decide if it is appropriate to include these areas in the final FZ3b outline

The following ArcGIS datasets are included within the zip file:

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- Functional_floodplain_2018_Draft_v04.shp (to be reviewed by LPA, LLFA and EA)
- Supporting data:
 - nat_hfm_v201804.shp
 - ABD_Wirral_201804.shp
 - FZ3_LAs_201804.shp
 - FZ2_LAs_201804.shp
 - Functional_Floodplain_FINAL_region_region.shp (Previous 2009 FZ3b)

6 EA Response to Draft L1 – Functional Floodplain

The EA acknowledged the approach undertaken for consideration of the functional floodplain in the absence of further detailed modelling at the time of creation, although advised the outlines did not look entirely accurate. The EA advise, at the time of writing, for the functional floodplain outlines to be considered in more detail through a Level 2 SFRA (if required), or if a site specific FRA is required. The EA note that some outlines appear to be on the ordinary watercourse network and would be very unlikely to update the models.