B Data sources used in this SFRA

1.1 Licensing

All data from Public Sector organisations is used under the **Open Government Licence v3.** Where other licensing applies, this is highlighted in the relevant section below.

1.2 Historical flooding

Norfolk County Council (as LLFA) publishes Section 19 Flood Investigation Reports in the area which include records of historical internal and external flood events within the area, available on the **Flood Investigations** page of their website. Details of relevant Section 19 Reports are included in Section 5.1 of the Main Report The LLFA also provided their register of flood incidents in December 2023.

Watton and Saham Flood Action Group have provided comprehensive records of flooding in their local area in July 2024, included in Appendix G.

The Environment Agency's Recorded Flood Outline Map is also presented in Appendix A: Geo-PDF Mapping.

1.3 Fluvial flooding

1.3.1 Flood Zones 2 and 3a

The Fluvial Model Flood Zones 2 and 3a, as shown in the Appendix A mapping, show the 1000-year (0.1% AEP) and 100-year (1% AEP) fluvial flood extents, respectively from the detailed model outputs where these were available, or broadscale models where detailed modelling does not exist. These were downloaded in March 2024 and remain accurate at the time of writing, however developers should refer to the Environment Agency's Flood Map for Planning to ensure the latest Flood Zones are accounted for in any development planning. Figure B- 1 shows the coverage of these models.

The Environment Agency's Flood Map for Planning Flood Zones 2 and 3 are also shown in the Appendix A mapping which should be used where detailed model outputs are not available.

Over time, the online mapping is likely to be updated more often than the SFRA, so SFRA users should check there are no major changes in their area.

1.3.2 Flood Zone 3b (the functional floodplain)

All the hydraulic models obtained for this SFRA already contain the 3.3% AEP event and therefore did not require additional re-runs for this event. All models were received

from the Environment Agency in December 2023, and developers should confirm with the Environment Agency that there have been no updates to models since.

For areas not covered by detailed EA models (or where suitable outputs were not available), a precautionary approach should be adopted for Flood Zone 3b with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a. If development is shown to be in Flood Zone 3a, further work should be undertaken as part of a detailed site-specific Flood Risk Assessment to define the extent of Flood Zone 3b.

If the area of interest is in an area that has seen some major changes to the extent of the Flood Zones, having checked the online mapping, developers will also need to remap Flood Zone 3b as part of a detailed site-specific Flood Risk Assessment.

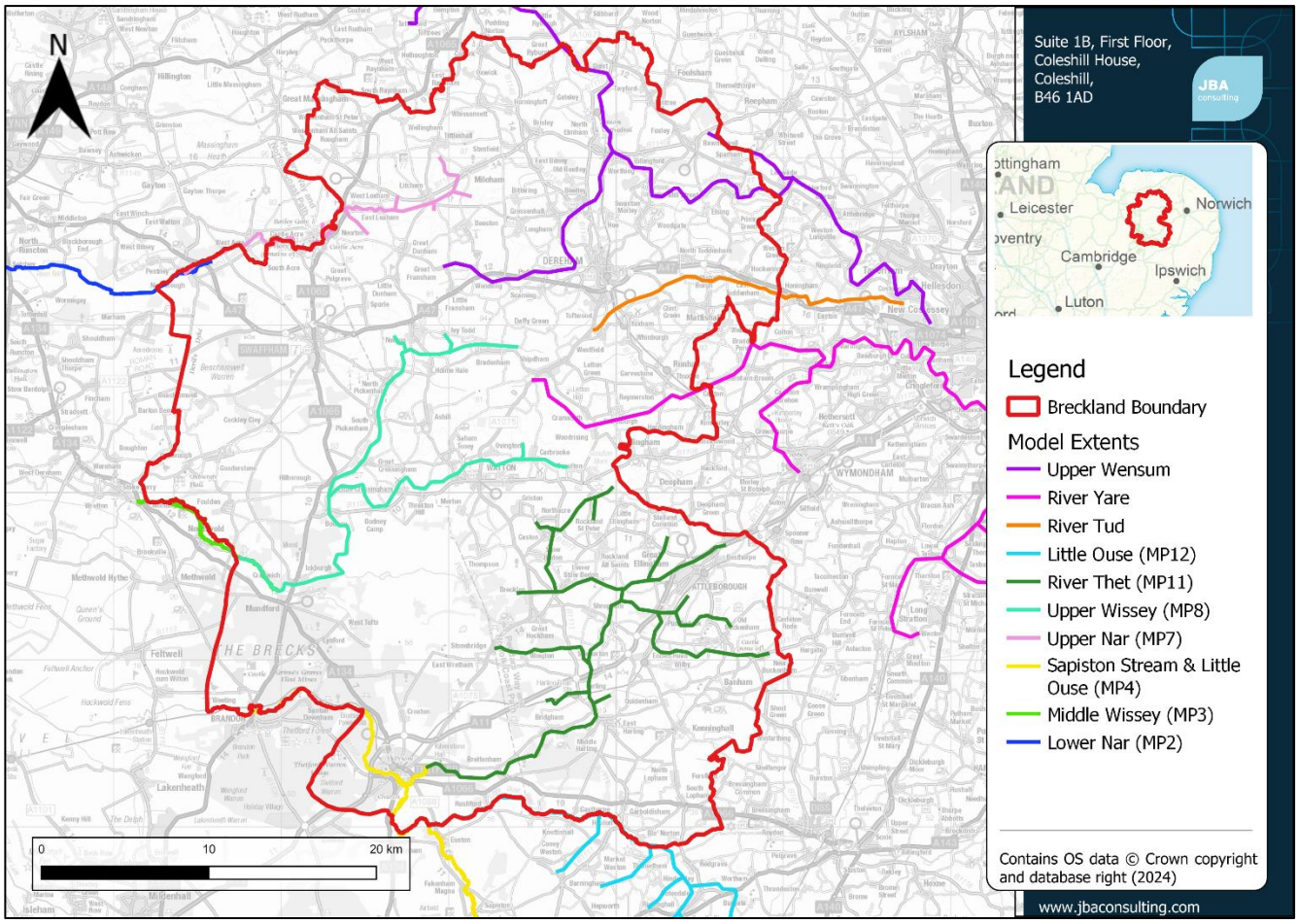

Figure B- 1: Existing hydraulic modelling coverage in Breckland

1.4 Climate change

Detailed Environment Agency hydraulic models were obtained under licence for this SFRA. For the majority of the hydraulic modelling obtained for the Breckland study area, the original climate change uplift of +20% that was used is within +/- 10% of the updated Higher Central climate change allowances. These were therefore deemed suitable to use for a strategic level assessment of risk, however any detailed site-specific flood risk assessment should apply the latest climate change allownaces. Additionally, as the original +20% uplifts for these models were the only climate change allowances provided, the 1% AEP +20% climate change events have been used as conservative proxies for the Central climate change allowance. This was the case for the following models detailed in Table B 1.

Table B 1: Original climate change uplifts used in this SFRA

Model	Original climate change uplift	Updated Central climate change allowance	Updated Higher Central climate change allowance
Middle Wissey (MP3)	1% AEP +20% CC	9%	19%
Sapiston Stream, River Thet, River Little Ouse (MP4)	1% AEP +20% CC	9%	19%
Upper Wissey (MP8)	1% AEP +20% CC	9%	19%
River Thet (MP11)	1% AEP +20% CC	9%	19%
Little Ouse (MP12)	1% AEP +20% CC	9%	19%
Upper Wensum	1% AEP +20% CC	11%	20%

Model	Original climate change uplift	Updated Central climate change allowance	Updated Higher Central climate change allowance
River Tud	1% AEP +20% CC	11%	20%
River Yare	1% AEP +20% CC	11%	20%

Additionally, the following climate change uplifts have been used from the original models:

- Lower Nar (MP2) 1% AEP +20% CC allowance (latest climate change allowance: +23% Central)
- Upper River Nar (MP7) 1% AEP +20% CC allowance (latest climate change allowance: +23% Central)

The following climate change uplifts were not provided in the original modelling and will therefore require re-running as part of the Level 2 assessment:

- Lower Nar (MP2)
  - 1% AEP +33% CC (Higher Central)
- Upper River Nar (MP7)
  - 1% AEP +33% CC (Higher Central)

For this Level 1 SFRA, the 0.1% AEP surface water flood event (obtained from the EA's Risk of Flooding from Surface Water dataset) has been used as a proxy for the surface water climate change uplifts. Updated Surface Water Climate Change uplifts will be provided as part of the Level 2 assessment.

Please refer to Chapter 4 for information on the approach to climate change in this SFRA.

1.5 Surface water flooding

Mapping of surface water flood risk in the study area has been taken primarily from the Risk of Flooding from Surface Water (RoFfSW) maps published online by the Environment Agency, downloaded in December 2023. These maps are intended to provide a consistent standard of assessment for surface water flood risk across England and Wales in order to help LLFAs, the Environment Agency and any potential developers to focus their management of surface water flood risk.

The RoFfSW is derived primarily from identifying topographical flow paths of existing watercourses or dry valleys that contain some isolated ponding locations in low lying areas. They provide a map which displays different levels of surface water flood risk

depending on the annual probability of the land in question being inundated by surface water (Table B 2).

Table B 2: RoFfSW EA risk categories

Category	Definition
High	Flooding occurring as a result of rainfall with a greater than 1 in 30 chance in any given year (annual probability of flooding 3.3%).
Medium	Flooding occurring as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
Low	Flooding occurring as a result of rainfall of between 1 in 1,000 (0.1%) and 1 in 100 (1%) chance in any given year.

Although the RoFfSW offers improvement on previously available datasets, the results should not be used to understand flood risk for individual properties. The results should be used for high level assessments such as SFRAs for local authorities. If a site is indicated in the Environment Agency mapping to be at risk from surface water flooding, a more detailed assessment should be considered to illustrate the flood risk more accurately at a site-specific scale.

1.6 Groundwater

Mapping of groundwater flood risk has been based on the JBA Groundwater Emergence Map 5m Resolution GW5 V2.3. This has been provided by JBA Consulting in December 2023. This mapping is the output of a model which processes various public and privately licensed datasets (including LiDAR, British Geological Survey mapping, Environment Agency groundwater monitoring level data, Ordnance Survey data and University of East Anglia Climatic Research Unit climatic variation records) to estimate the probability of groundwater emergence occurring in any given year at a 5m grid resolution. Graphical outputs are available in the GEOPDF mapping, and the underlying dataset is available on request from JBA Consulting (subject to a license fee).

This Groundwater Emergence Risk Map highlights areas where there is sufficient evidence to suggest that flooding should occur. The map should be interpreted as an initial indicative tool to assess groundwater flood risk.

The product is suitable for general broad-scale assessment of the groundwater flood hazard in an area, but is not explicitly designed for the assessment of flood hazard at the scale of a single property. In high risk areas a site-specific risk assessment for groundwater flooding is recommended to fully inform on the likelihood of flooding.

Section 5.7 of the Level 1 SFRA explains groundwater flooding.

1.7 Sewers

Anglian Water provided details of 566 recorded incidents of sewer flooding which have occurred in the study area. These were provided using four-digit postcode areas for the period between the 3rd June 2005 and 31st March 2024. This data was supplied in August 2024.

Section 5.6 of the Main Report explains sewer flooding.

1.8 Reservoirs

The risk of inundation because of reservoir breach or failure of reservoirs within Breckland has been mapped using the outlines produced as part of the National Reservoir Flood Mapping (RFM) study, accessed for this study in December 2023, and are shown online on the Long-Term Risk of Flooding website at the time of publication.

The Environment Agency provide two flooding scenarios for the reservoir flood maps: a 'dry-day' and a 'wet-day'. The 'dry-day' scenario shows the predicted flooding which would occur if the dam or reservoir fails when rivers are at normal levels. The 'wet-day' scenario shows the predicted worsening of the flooding which would be expected if a river is already experiencing an extreme natural flood.

Section 5.8 of the Main Report presents the reservoirs affecting Breckland.

1.9 Flood Defences

The Environment Agency supplied the location of all flood defences within Breckland in their AIMS database, including information relating to the type of flood defence and their standard of protection. The Areas Benefitting from Defences shapefile was also considered. Chapter 6 of the Main Report provides information on flood defences and schemes.

1.10 Overview of supplied data

Overview of supplied data for the Breckland SFRA from stakeholders is as follows:

Source of flood risk	Data used to inform the assessment	Data supplied by	Date Supplied
Historic (all sources)	Historic Flood Map Recorded Flood Outlines Hydraulic Modelling Reports	Environment Agency	December 2023
	Historic Flood register Section 19 Reports	Norfolk County Council	December 2023 July 2024 (published online)
	Historic sewer flooding incident records	Anglian Water	August 2024
Fluvial	Lower Nar (2015) 1D-2D ISIS-TUFLOW Middle Wissey (2015) 1D-2D ISIS-TUFLOW Sapiston Stream, River Thet, River Little Ouse (2015) 1D-2D ISIS-TUFLOW Upper River Nar (2015) 2D TUFLOW Upper Wissey (2015) 1D-2D ESTRY-TUFLOW River Thet (2015) 2D TUFLOW Little Ouse (2015) 2D TUFLOW Upper Wensum (2017) 1D ISIS River Tud (2017) 1D ISIS River Yare (2014) 1D ISIS	Environment Agency	December 2023

Source of flood risk	Data used to inform the assessment	Data supplied by	Date Supplied
	Flood Map for Planning Flood Zones	Environment Agency	March 2024
Surface Water	Risk of Flooding from Surface Water dataset	Environment Agency	December 2023
Groundwater	Bedrock geology/superficial deposits datasets (online dataset)	British Geological Survey	December 2023
	JBA Groundwater Emergence Map 5m Resolution GW5 V2.3	JBA Consulting	December 2023
Reservoirs	National Inundation Reservoir Mapping (long term flood risk map)	Environment Agency	December 2023
Flood defences	Location and description of flood defences	Environment Agency	December 2023
Cross boundary impacts	Neighbouring authority sites and Local Plan information, to help assess cross-boundary impacts and the cumulative impact assessment	North Norfolk District Broadland District South Norfolk District Mid Suffolk District West Suffolk District Kings Lynn and West Norfolk District	March 2024

Source of flood risk	Data used to inform the assessment	Data supplied by	Date Supplied
Other datasets	Partner Data Catalogue: - AIMS asset bundle - Areas with Critical Drainage Problems - Historic flood warnings - Historic landfill - LIDAR Composite DTM 2020 1m & 2m - Nitrate Vulnerable Zones - National Receptor Dataset (for CIA) - Recorded Flood Outlines - Risk of Flooding from Rivers and Sea - Risk of Flooding from Rivers and Sea (properties in areas at risk) - Reduction in Risk of Flooding from Rivers and Sea due to Defences - Reservoir Inundation Maps - Risk of Flooding from Surface Water - Spatial Flood Defences Including AIMS - Source Protection Zones - Aquifer Designation Maps - Detailed River Network - Flood Alert Areas - Flood Warning Areas - Flood Maps for Planning - Groundwater Vulnerability - Historic Flood Map	Environment Agency	Downloaded December 2023

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