B Data sources used in this SFRA

1.1 Historical flooding

The City of Wolverhampton Council provided one Section 19 report in Wolverhampton detailing historic flood events which occurred in February and June 2020. Other Section 19 reports are currently being written and will not be made publicly available until the end of 2024. Staffordshire County Council also provided historic flooding data for the Wolverhampton area. This data is presented in section 5.1 of the Main Report.

The Environment Agency's Historic Flood Map is presented in Appendix A: Static mapping.

1.2 Fluvial flooding

1.2.1 Flood Zones 2 and 3a

The fluvial hydraulic modelling shows the 1000-year (0.1% AEP) and 100-year (1% AEP) fluvial flood extents, which represent Flood Zones 2 and 3, respectively. Figure B-1 shows the coverage of these models. The model extents are also displayed in Appendix A mapping.

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.

1.2.2 Flood Zone 3b (the functional floodplain)

The hydraulic models obtained for this SFRA do not contain the 3.3% AEP event. However, the 2% AEP event for both models have been provided and are deemed appropriate to use as conservative proxies for an indicative Flood Zone 3b. As a result, no additional re-runs were required for this Level 1 assessment.

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.

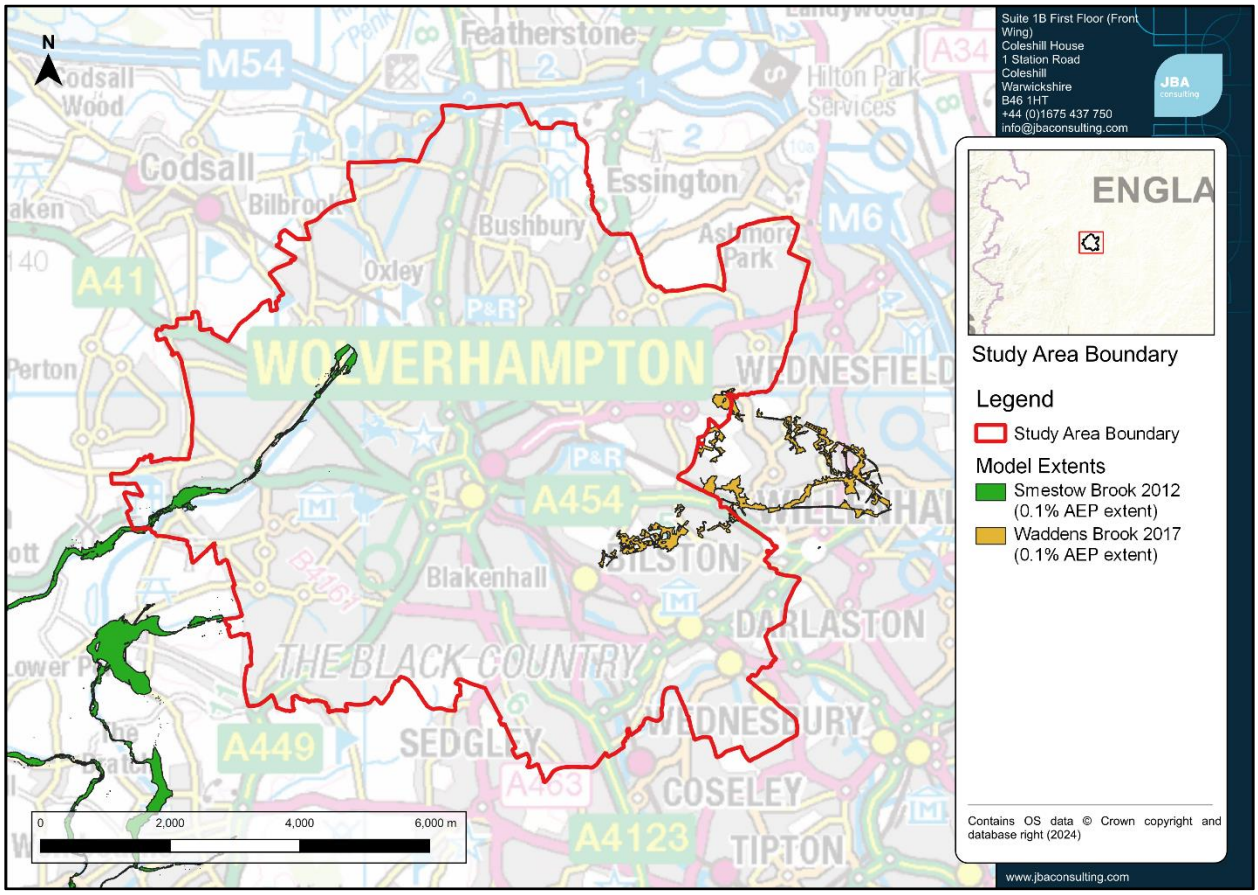

Figure B- 1: Existing hydraulic modelling coverage in Wolverhampton

1.3 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. 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 1).

Table B 1: 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.

1.4 Climate change

Detailed Environment Agency hydraulic models were obtained under licence for this SFRA. The original climate change uplifts that were used are within +/- 10% of the updated Central, Higher Central and Upper End climate change allowances, respectively. These were therefore deemed suitable to use. Details of the modelled climate change uplifts are in Table B 2.

Table B 2: Original climate change uplifts used in this SFRA

Model	Original climate change uplifts (Central, Higher Central and Upper End)	Updated climate change allowances (Central, Higher Central and Upper End)
Waddens Brook (JBA Consulting, 2017)	1% AEP +20%CC, +30%CC, +50%CC	+22%CC, +30%CC, +51%CC
Smestow Brook (Capita, 2012)	1% AEP +20%CC *	+30%CC, +40%CC, +67%CC

**Although the 1% AEP plus 20% CC flood event was the only climate change uplift that was simulated in the original 2012 Smestow Brook hydraulic model, it has not been deemed necessary to re-run this model to produce updated Higher Central and Upper End flood extents. This is because these allowances are not required within this Level 1 assessment. Should a Level 2 assessment be required, it may only be deemed necessary to simulate flood events with these climate change uplifts if any site allocations are classified as 'Essential Infrastructure'.*

Surface Water Climate Change uplifts were modelled for the Risk of Flooding from Surface Water (RoFfSW) dataset for the following events and scenarios:

- 3.3% AEP +35% CC
- 1% AEP +40% CC
- 0.1% AEP +40% CC

Please refer to Chapter 4 of the Level 1 report for information on the approach to climate change in this SFRA.

1.5 Groundwater

Mapping of groundwater flood risk has been based on the JBA Groundwater Emergence Risk Map. This has been provided by JBA Consulting. The JBA 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.

Section 4.7 of the Level 1 SFRA explains groundwater flooding.

1.6 Sewers

Section 5.9 of the Main Report explains sewer flooding. Severn Trent Water is the water company responsible for the management of the sewer drainage networks across Wolverhampton. They have provided details of 444 recorded incidents of sewer flooding which have occurred in Wolverhampton. These were provided using four-digit postcode areas for the period between 11th June 1997 and 24th October 2023.

1.7 Reservoirs

The risk of inundation because of reservoir breach or failure of reservoirs within Wolverhampton has been mapped using the outlines produced as part of the National Reservoir Flood Mapping (RFM) study, 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 5.10 of the Main Report presents the reservoirs affecting Wolverhampton.

1.8 Flood Defences

The Environment Agency supplied the location of all flood defences within Wolverhampton 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.

1.9 Overview of supplied data

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

Source of flood risk	Data used to inform the assessment	Data supplied by
Historic (all sources)	Historic Flood Map Recorded Flood Outlines Hydraulic Modelling Reports	Environment Agency
	Section 19 Reports	City of Wolverhampton Council
	Historic flooding data	Staffordshire County Council
Fluvial	Waddens Brook (JBA, 2017) 1D-2D ESTRY-TUFLOW Model Smestow Brook (Capita, 2012) 1D-2D ISIS-TUFLOW Model	Environment Agency
	Flood Map for Planning Flood Zones	Environment Agency
Surface Water	Risk of Flooding from Surface Water dataset	Environment Agency
Sewer	Internal and external historic drainage records	Severn Trent Water
Groundwater	Bedrock geology/superficial deposits datasets (online dataset)	British Geological Survey
	JBA Groundwater Emergence Risk Map	JBA Consulting
Reservoirs	National Inundation Reservoir Mapping (long term flood risk map)	Environment Agency
Flood defences	Location and description of flood defences	Environment Agency

Source of flood risk	Data used to inform the assessment	Data supplied by
Cross boundary impacts	Neighbouring authority sites and Local Plan information, to help assess cross-boundary impacts and the cumulative impact assessment	Dudley Metropolitan Borough Council Sandwell Metropolitan Borough Council South Staffordshire District Council Walsall Council
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

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