



Flood Investigation Report

Storm Henk

2nd January 2024

Broughton Astley

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Close 5

4 BROUGHTON ASTLEY

Broughton Astley village is located in Harborough District approximately 14km south-west of Leicester City centre.

4.1 LOCAL DRAINAGE CONTEXT

The Broughton Astley Brook flows northwards through the centre of Broughton Astley village, draining a predominantly agricultural catchment. The catchment also includes the neighbouring villages of Leire, Ashby Parva and Dunton Bassett (as illustrated in Figure 4-1. Broughton Astley Brook discharges to the River Soar just north-east of Croft, approximately 2.5km north of the village at Ordnance Survey national grid reference (OSNGR) SP 52051 96276.

Both the River Soar and Broughton Astley Brook are designated Main Rivers and as such, the responsible agency for managing the risk from Main Rivers is the EA. Details relating to RMA responsibilities can be found in Section 21 of the main Storm Henk report.

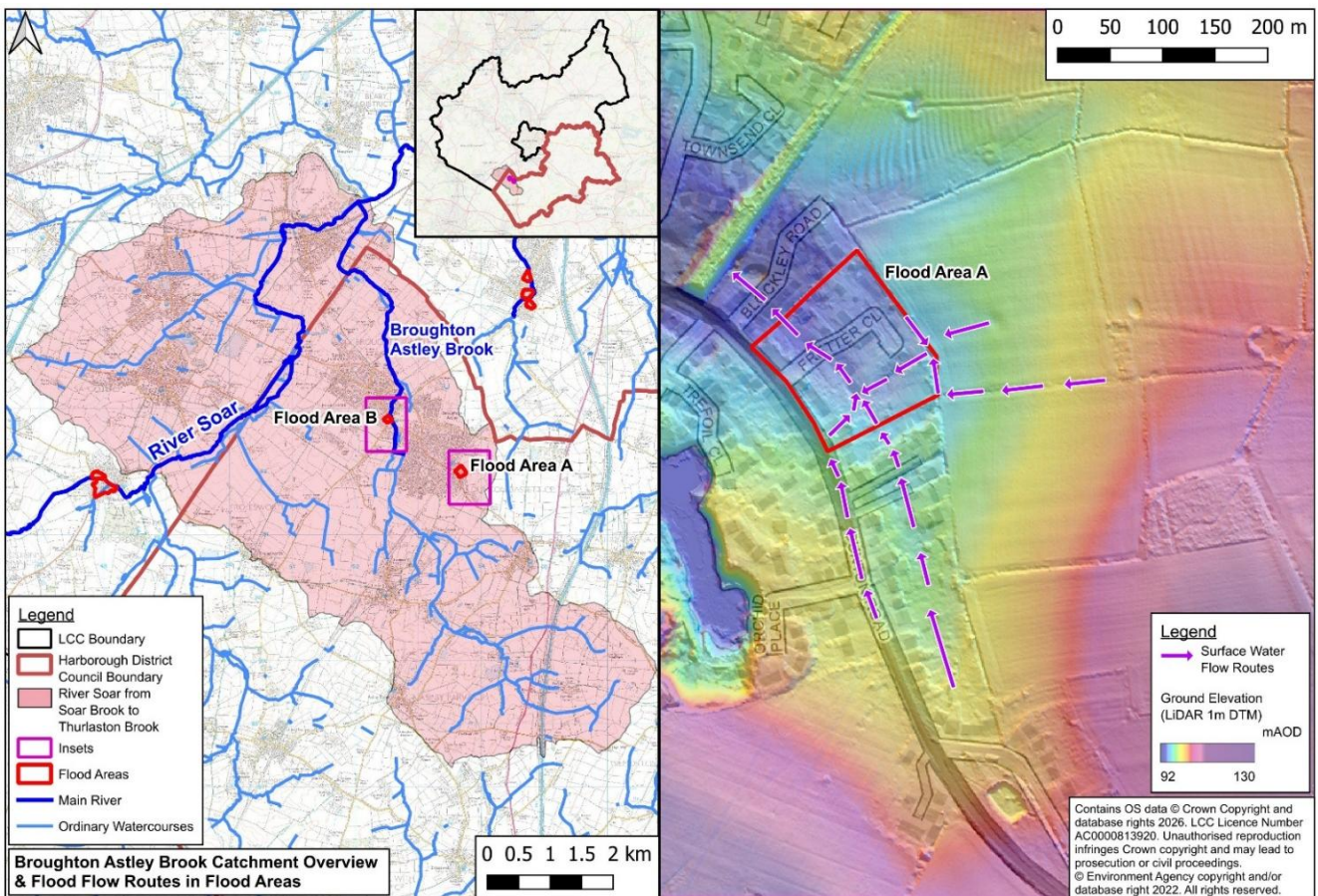


Figure 4-1: Broughton Astley location plan, relevant watercourse catchment and flow routes through Flood Area A (INSET 17A)

4.1.1 GEOLOGY

The British Geology Society’s (BGS) online mapping¹ indicates that Broughton Astley is dominated by superficial deposits of Thrussington Till Member. Till is often referred to as boulder clay and it is characterised by poor permeability and low infiltration rates.

4.1.2 FLOOD AREA A – FRETTER CLOSE

Fretter Close is located on the south-eastern edge of Broughton Astley, approximately 800m east of Broughton Astley Brook.

NATIONAL SCALE PREDICTIVE FLOOD MAPPING

The EA provides flood risk mapping nationally for both rivers and surface water as detailed within Section 2.7.6 of the main Storm Henk report. Fretter Close is entirely located within the Flood Zone 1 on the EA’s Flood Map for Planning (NaFRA2), being at low risk of flooding from rivers and the sea.

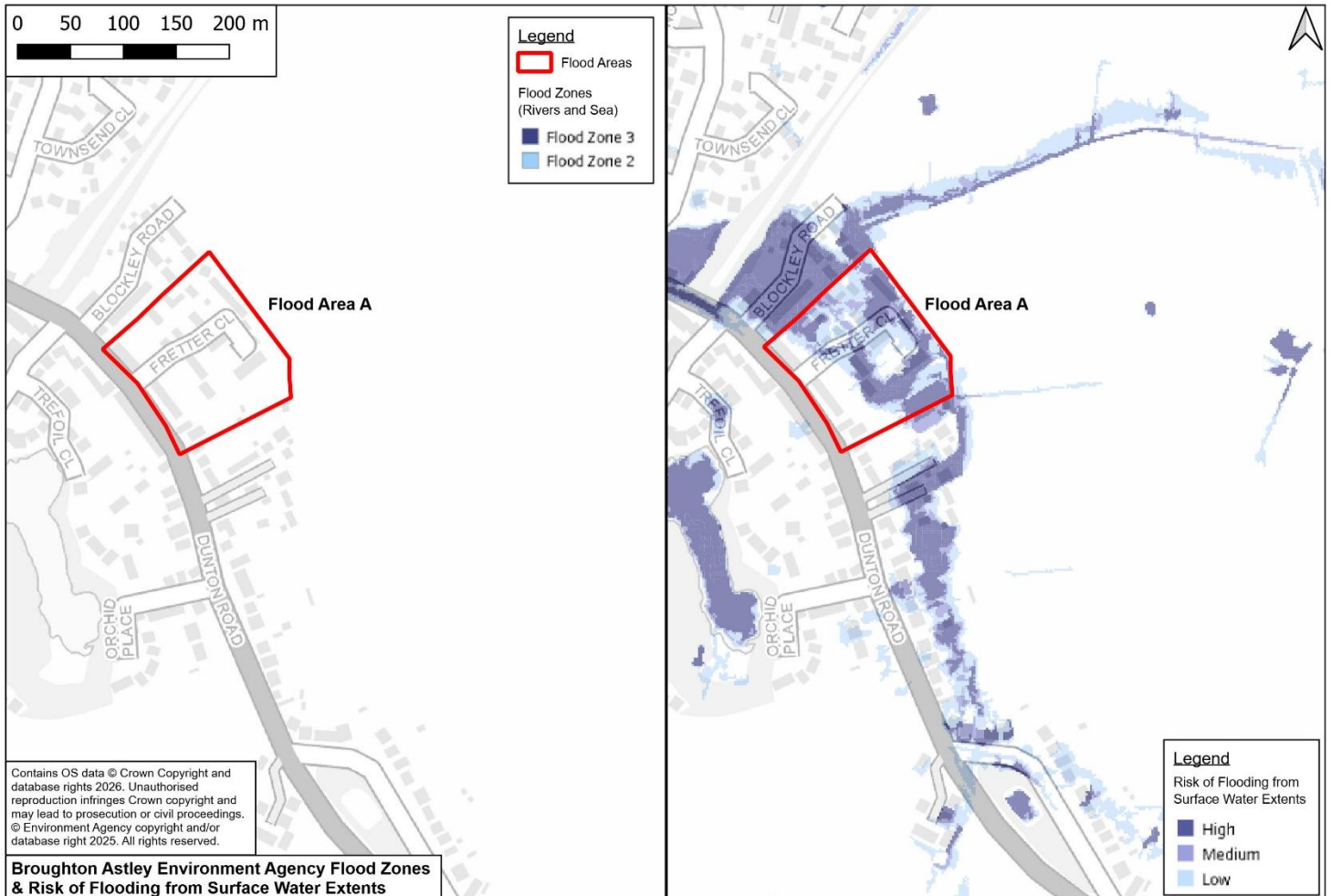


Figure 4-2: Broughton Astley Flood Map for Planning Flood Zones² and Risk of Flooding from Surface Water Extents³ in Flood Area A (INSET 17A)

¹ British Geological Survey (2026) BGS Geology Viewer. <https://geologyviewer.bgs.ac.uk/>

² Environment Agency (2026) Flood Map for Planning – Flood Zones <https://flood-map-for-planning.service.gov.uk/map>

³ Environment Agency (2026) Risk of Flooding from Surface Water map. <https://check-long-term-flood-risk.service.gov.uk/map>

The EA's Risk of Flooding from Surface Water (RoFSW) map (NaFRA2) as illustrated in Figure 4-2 however indicates that parts of Fretter Close have a high and medium chance of surface water flooding. The RoFSW (NaFRA2) mapping suggests the contributing catchment area upstream of Fretter Close consists of the north side of 'Clump Hill' and the fields immediately to the east of Broughton Astley. However, the strategic level catchment mapping provided by the UK Centre for Ecology & Hydrology's Flood Estimate Handbook (FEH) Web Service⁴ estimates a substantially different catchment to the RoFSW (NaFRA2) dataset, indicating Fretter Close is located close to the confluence of two surface water sub-catchments, as indicated in Figure 4-3. This states that the sub-catchment south east of Fretter Close has an area of 0.68km² and the second sub-catchment further south has an area of 0.5km².

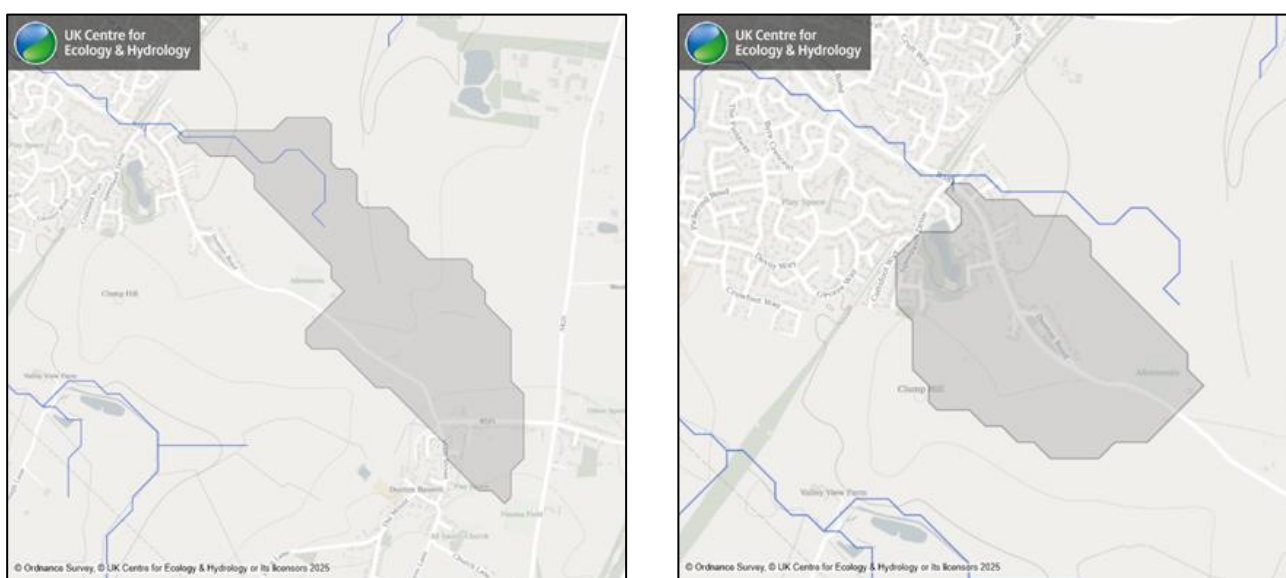


Figure 4-3: FEH Web Service Catchment Extends to the South-East of Fretter Close, Broughton Astley

Surface water flood risk is often significantly affected by localised ground elevation detail, sub-surface drainage infrastructure modifications to the catchment watersheds, or drainage infrastructure limitations, which are not represented within the coarse FEH Web Service methodology, nor represented in such detail within the strategic level RoFSW (NaFRA2) mapping.

Following site investigation work, undertaken as part of this flood investigation, it is concluded that whilst both strategic datasets show discrepancies, the RoFSW (NaFRA2) map is likely to be more representative of the actual drainage catchment extents than the FEH Web Service's definitions, as more detailed definition of the local topography is included.

The site investigations show that there are two dominant surface water networks draining towards Fretter Close, as described below.

⁴ Centre for Ecology & Hydrology (2026) FEH Web Service <https://fehweb.ceh.ac.uk/Map>

DUNTON ROAD DRAINAGE SYSTEM

There is a drainage network that collects land and surface water drainage from Dunton Road and adjacent fields. This network conveys water along Dunton Road in two separate systems on either side of the highway. Some of these flows enter a large attenuation basin within greenspace between 67b and 101 Dunton Road. The basin outfall enters a 150mm pipe, which eventually joins a 225mm diameter STW surface water sewer at the junction of Fretter Close. This STW sewer network outfalls into an open ditch between Blockley Road and the disused Midland Counties' Railway line. Several catchments converge at this location, before flows pass underneath the disused railway line in a single 600mm diameter culvert.

PREVIOUS SECTION 19 FLOOD INVESTIGATION

In March 2016, a formal flood investigation was initiated following reports of two properties flooding on Dunton Road close to the LCC attenuation basin. Following initial investigation, it was found that the flooding was limited to garages and external areas and therefore the impacts fell beneath the threshold for continuation of a formal flood investigation at the time.

DRAINAGE DITCHES TO THE WEST OF FRETTER CLOSE

There is another network of drainage ditches to the east of Fretter Close that converge at the rear of 20 Fretter Close and 29 Dunton Road, as illustrated in Figure 4-4.

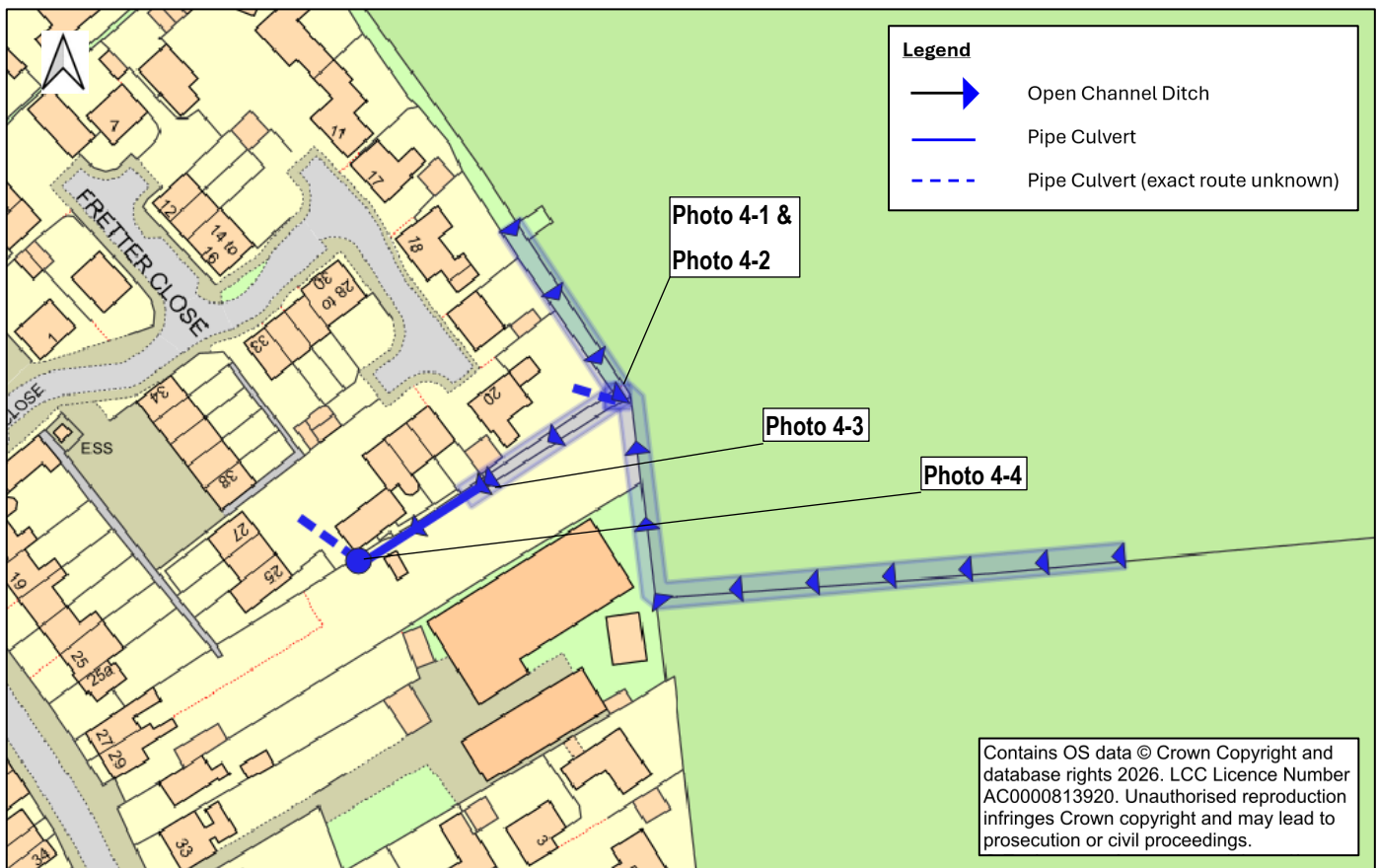


Figure 4-4: Drainage Ditch Network East of Fretter Close

Here, surface water enters a 225mm diameter culvert pipe (Photograph 4-1), which flows under the rear garden of 20 Fretter Close and then under neighbouring rear gardens. During high flows, the pipe capacity is exceeded (Photograph 4-2) and surface water overtops into a higher-level ditch between 29 Dunton Road and 20 Fretter Close. The higher-level ditch enters a 225mm culvert pipe (Photograph 4-3), which eventually enters a manhole and turns right (Photograph 4-4) under the Fretter Close development and passes across the front of several properties along Fretter Close.

(Note not during the Storm Henk event but during wet weather February 2026)



Photograph 4-1: 225mm dia culvert inlet during low flow conditions – December 2025



Photograph 4-2: 225mm dia culvert inlet submerged during wet weather – February 2026



Photograph 4-3: High-level ditch / culvert – December 2025



Photograph 4-4: Inspection chamber where high-level piped ditch ends before turning right into Fretter Close

4.1.3 FLOOD AREA B – FROLESWORTH ROAD AND STATION ROAD

The area around the junctions of Jubilee Road, Frolesworth Road and Station Road (Figure 4-5) lies adjacent the left bank of Broughton Astley Brook (EA designated Main River), of which the FEH Web Service identifies as having a catchment area upstream of Main Street as 17.9km².

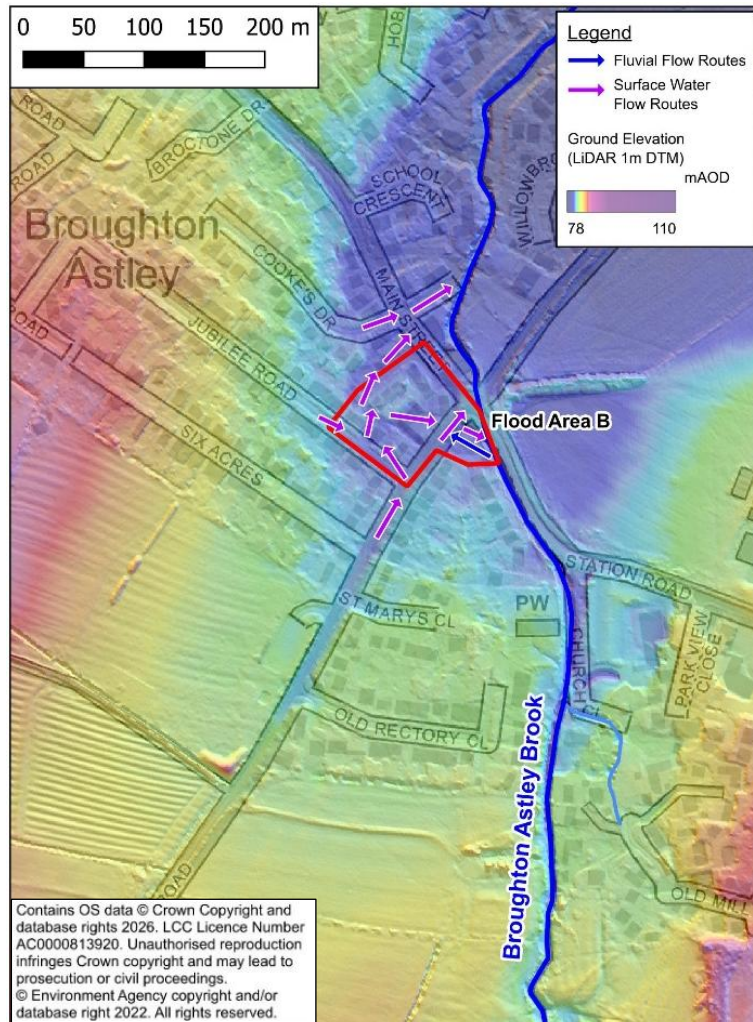


Figure 4-5: Broughton Astley Flow Routes through Flood Area B (INSET 17B)

NATIONAL SCALE PREDICTIVE FLOOD MAPPING

The area is located within EA Flood Map for Planning (NaFRA2) Flood Zones 2 and 3 associated with Broughton Astley Brook, having a medium to high risk respectively of flooding from rivers and the sea, as illustrated in Figure 4-6. The area is also identified in the EA’s RoFSW map (NaFRA) as being at a high chance of surface water flooding at the junction of Jubilee Road and Frolesworth Road (Figure 4-6).

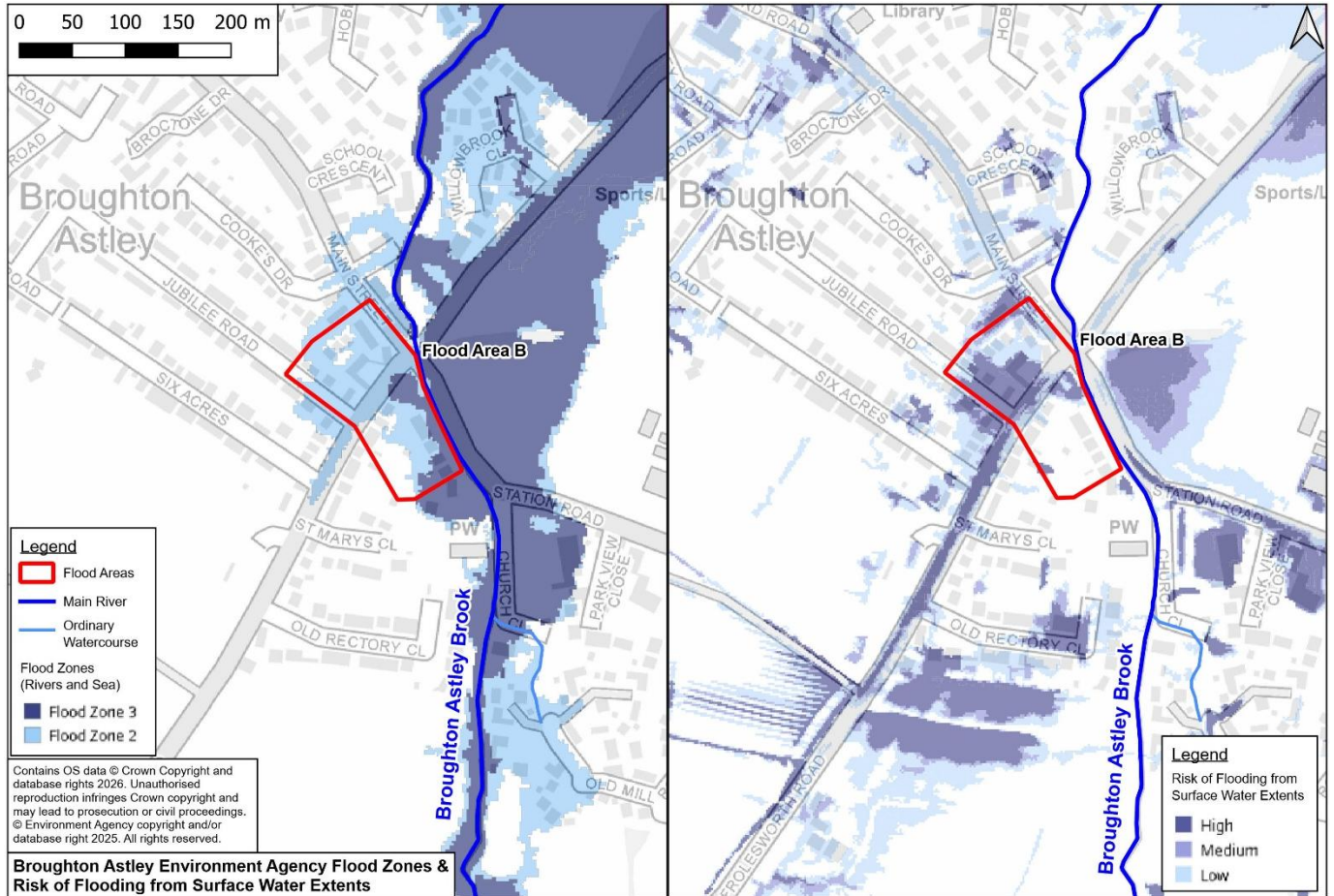


Figure 4-6: Broughton Astley EA Flood Map for Planning Flood Zones² and Risk of Flooding from Surface Water Extents³ in Flood Area B (INSET 17B)

Whilst internal property flooding did occur at this location on 2nd January 2024, the extent of flooding did not trigger the Council’s threshold for a formal flood investigation on this occasion. However, more recent flooding on 6th January 2025 did trigger the threshold and this investigation will be published in due course.

As a result, the remainder of Section 4 refers to the flooding within Flood Area A at Fretter Close.

4.1.4 HYDROMETRY

There are no known river flow gauges on the relevant watercourse within this catchment area.

4.1.5 FLOOD WARNINGS

There are no Flood Warning Areas covering Flood Area A, specifically as it is not within any flood extents of any Main Rivers for which the EA are responsible.

4.2 WHAT HAPPENED AND WHY?

WHO OR WHAT WAS AFFECTED?



5 properties reported as internally flooded



At least 1 property reported as externally flooded

Two key flooding mechanisms have been identified in Flood Area A as follows.

4.2.1 FLOOD AREA A

PRIVATE CULVERT AND DITCH CAPACITY EXCEEDED BETWEEN FRETTER CLOSE AND DUNTON ROAD PROPERTIES

During the high-intensity rainfall event on 2nd January 2024, the catchment of private drainage ditches and culverts upstream of Fretter Close became overwhelmed. Pre-existing soil saturation within agricultural land rapidly limited infiltration capacity, resulting in accelerated surface runoff.

The capacity of the private 225mm pipe to the rear of 20 Fretter Close and 29 Dunton Road was quickly exceeded. The arrangements described above (Section 0 ‘Drainage Ditches to the West of Fretter Close’) cause water to enter a higher-level overflow ditch and then into a second 225mm pipe between the two properties (as illustrated in **Error! Reference source not found.**). Photographic and video evidence submitted as part of the investigation, shows clearly that the second 225mm pipe became overwhelmed.

Due to a lack of available evidence, it has not been possible to conclusively establish whether this was due to hydraulic overload or blockage within the second pipe, however, anecdotal reports advise that water levels quickly subsided when a member of the public lifted a private access cover, where the 225mm pipe changes direction. This may suggest a restriction or blockage was present in the culvert upstream of the access cover, although LCC, as Lead Local Flood Authority (LLFA), has not identified any further evidence to date to verify this.

When the private culvert and ditch system capacity is exceeded, flood water follows the ground elevations downhill along the easiest route. This results in two flood flow paths; one directly from the ditches to the rear of 18 to 20 Fretter Close, and another from the higher-level overflow ditch which floods local gardens before eventually emerging at the rear of 25 to 27 Fretter Close (as illustrated in **Error! Reference source not found.**).

OVERLAND FLOW OF SURFACE WATER EXCEEDING DRAINAGE CAPACITY ALONG DUNTON ROAD

The capacity of drainage infrastructure along Dunton Road was exceeded as a result of the speed and intensity of the rainfall that fell during Storm Henk. This resulted in overland flows of surface water being conveyed along the carriageway. Anecdotal reports suggested that water left the carriageway between the junctions of Thorneycroft Close and Fretter Close and flowed to the rear of properties on Dunton Road. Here flood flows converge with the other flows described in the section above.

Typically, road drainage networks are designed to accommodate limited rainfall events on the contributing area of highway itself only and are not designed to accommodate any additional volumes of overland flow originating from land adjacent to the highways as occurred here, or overtopping onto them from watercourses.

4.3 WHAT HAS BEEN DONE?

In February 2024, LCC LLFA was informed of flooding impacting properties on Fretter Close during January 2024. In response, LCC LLFA issued flood resilience advice including details of the Flood Recovery Framework grant information (see Section 2.7.4 of the main Storm Henk report).

In September 2024, following further investigation linked to the above mentioned report, it was confirmed that at least five properties were internally flooded on Fretter Close during Storm Henk. As previously mentioned, on 6th January 2025, another major countywide flood event occurred, which resulted in widespread internal flooding to Fretter Close and this flood event is being investigated separately. Officers from Harborough District Council (HDC) and LCC LLFA conducted door-to-door information and data gathering in the immediate aftermath of this event, which contributed to the findings of this flood investigation.

Throughout 2025, a series of mapping and condition surveys were undertaken by STW and the LCC Local Highways Authority (LHA) on Fretter Close, Dunton Road and downstream on Blockley Road. Additional work was undertaken by LCC LLFA to evaluate planning documents associated with Fretter Close and Blockley Road developments.

As part of this formal flood investigation, and with the support of STW, LCC LHA and local residents, a more comprehensive understanding of the drainage arrangements around Fretter Close has been established by LCC LLFA. It is clear that when the capacity of the network of private drainage ditches and culverts that drain land to the east of Broughton Astley are exceeded, homes are susceptible to internal flooding from the resultant flood route.

The housing development now known as Fretter Close was granted planning consent by HDC in 2005. This time predated the establishment of the LCC LLFA (2010) as a lead on surface water flood risk and also the earliest national strategic level surface water flood mapping (which was the EA's Flood Map for Surface Water (FMfSW)).

A summary table of the actions undertaken by the relevant RMAs across Leicestershire is provided in Section 2.7 of the main Storm Henk report. A summary table of actions and any relevant next steps specific to Broughton Astley is provided in Section 4.4.

Whilst the actions from this investigation will help to reduce flood risk, communities should also take steps to be prepared for future flooding, especially with climate change increasing the risk of occurrence. More information can be found in Section 21.8 of the main Storm Henk report.

4.4 BROUGHTON ASTLEY ACTIONS

The following actions will be monitored by LCC LLFA through their local coordination role. This action plan is live and will be subject to change as actions are progressed.

Actions taken during and in the immediate aftermaths of the event, such as the closure of roads and set-up of rest centres are not detailed. Further details on RMAs and their roles, and how they work in partnership, can be found in the Leicestershire Local Flood Risk Management Strategy⁵.

4.4.1 LONG-TERM ACTIONS (12 MONTHS +)

ACTION	ACTION DETAIL	LEAD RMA	CURRENT STATUS
STW Asset Survey	STW to undertake a condition survey and map all foul and surface water asset around Fretter Close and Blockley Road.	STW	Completed
LCC LHA Asset Survey and Works	Initial survey and mapping undertaken. LCC LHA to undertake a condition survey and map all surface water assets along Dunton Road from the attenuation basin to Blockley Road.	LCC LHA	Completed - 7 th July 2025.
Prospective Development Engagement	Enhanced scrutiny of major planning applications. Continue proactive engagement with Davidsons Homes (proposed development at Land at Station Farm (near Blockley Road).	LCC LLFA	Ongoing LCC LLFA issued a consultation response to outline application reference 26/00018/OUT on 4 th February 2026.

⁵ Leicestershire County Council (2024) Leicestershire Local Flood Risk Management Strategy - <https://www.leicestershire.gov.uk/environment-and-planning/flooding-and-drainage/lead-local-flood-authority/flood-risk-management>

ACTION	ACTION DETAIL	LEAD RMA	CURRENT STATUS
<p>Capital and Investment Review</p>	<p>Seek funding opportunities for the identification of appropriate flood mitigation measures. These could include property level resilience measures and/or drainage improvement works.</p> <p>Assessment into the cost-benefit of installing flow gauges within the Fretter Close catchment.</p>	<p>LCC LLFA</p>	<p>Ongoing</p> <p>LCC LLFA is seeking funding to undertake survey and modelling work to inform optioneering and complete a cost benefit analysis.</p>