Flood Investigation Report

Storm Henk

2nd January 2024

Fleckney

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15 FLECKNEY

Fleckney is a village with a population of around 5000 people, located within the Harborough District approximately 14.5km south-east of Leicester.

The reported number of properties that internally flooded from Storm Henk did not trigger a formal investigation for Fleckney. For more information see the main Storm Henk report.

15.1 LOCAL DRAINAGE CONTEXT

There are multiple ordinary watercourses within the boundary of the village. This summary report focussed on those that influence the Flood Areas of the Storm Henk event.

FLECKNEY BROOK

The Fleckney Brook, a tributary of the River Sence, flows north eastwards through the centre of Fleckney predominantly alongside Main Street then Arnesby Road as illustrated in Figure 15-1. Fleckney Brook is mainly an open channel with culverts/open span bridge features where the brook is crossed by footpaths and roads. The UK Centre for Ecology & Hydrology's Flood Estimate Handbook (FEH) Web Service[1] provides strategic level catchment mapping for the area, as illustrated in Figure 15-2. This identifies that Fleckney Brook drains a predominately rural catchment area of approximately 1.18km^2 to its confluence with Ordinary Watercourse 1 immediately downstream of Blackbird Road (described below). The catchment area of Fleckney Brook at its confluence with Burton Brook (located downstream of Fleckney at OSNGR SP 65856 95010), is 6.98km^2, where they combine to become the River Sence.

ORDINARY WATERCOURSE 1

An unnamed ordinary watercourse (Ordinary Watercourse 1) joins Fleckney Brook (at Ordnance Survey National Grid Reference (OSNGR) SP 64470 93120) from the southeast draining rural/agricultural land with a catchment area of 0.64km^2.

A second unnamed ordinary watercourse (Ordinary Watercourse 2) converges with Fleckney Brook at OSNGR SP 64960 93479 just downstream of High Street. The FEH does not provide a discrete sub-catchment area for this tributary, however the combined catchment area of this with Fleckney Brook increases to 3.7km^2 at this confluence downstream of Main Street.

ORDINARY WATERCOURSE 2

Ordinary Watercourse 2 drains the built up south eastern part of Fleckney and is characterised as a mix of open and culverted watercourse, which originates between Tigers Road and Badcock Way, running as an open channel for some of its path along Saddington Road and into the 'Duck Pond' before converging with Fleckney Brook.

[1] Centre for Ecology & Hydrology (2026) FEH Web Service https://fehweb.ceh.ac.uk/Map

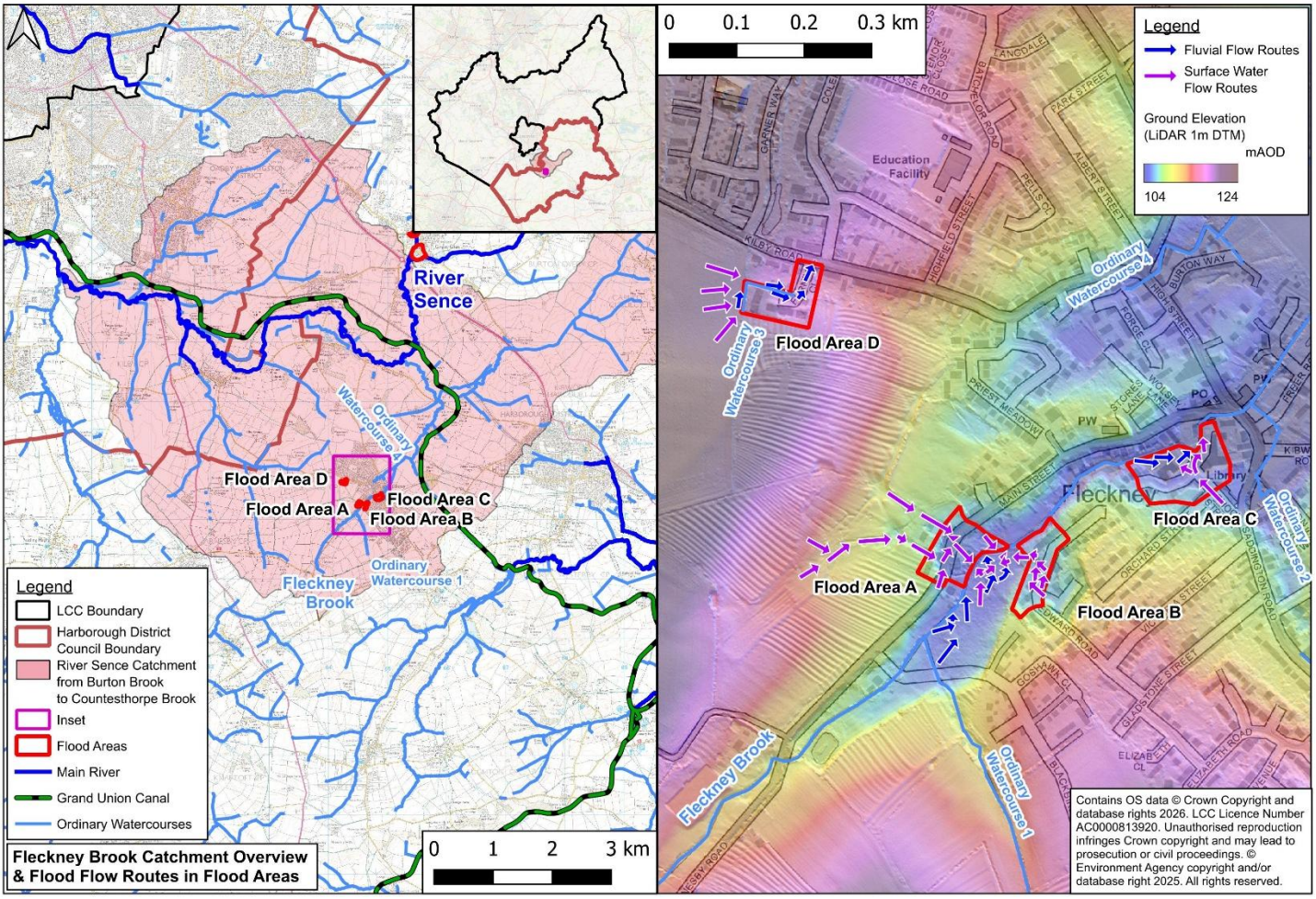


Figure 15-1: Fleckney Location Plan, relevant Watercourse Catchment and Flow Routes through Flood Area (INSET 14)

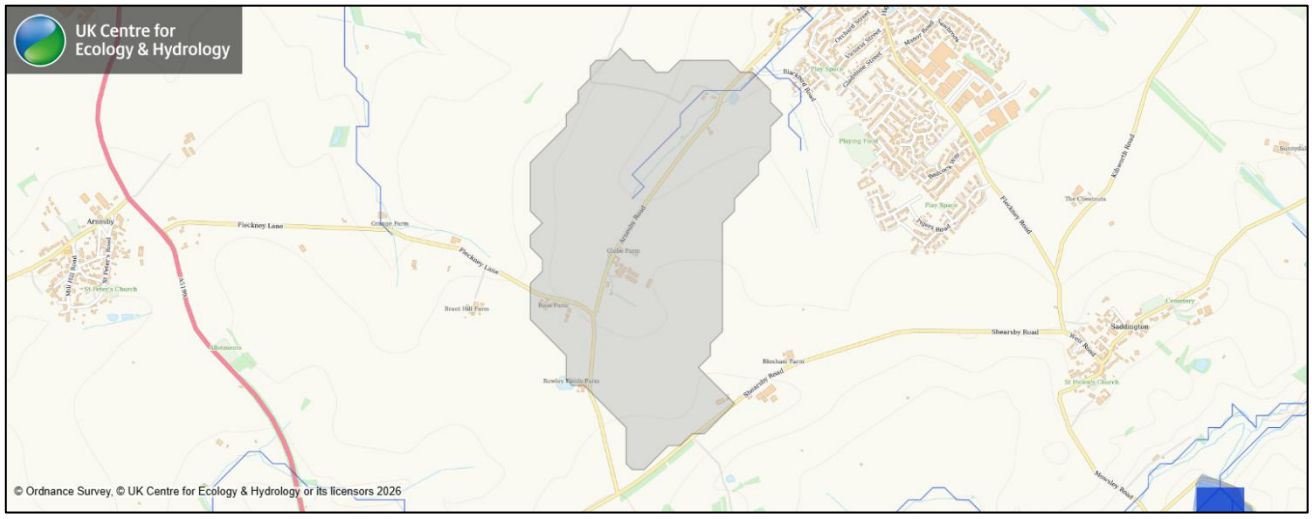
ORDINARY WATERCOURSE 3

A third unnamed ordinary watercourse (Ordinary Watercourse 3) drains the surface water runoff from fields behind properties 9 to 12 Furnival Close. This watercourse collects into a ditch (issuing at OSNGR SP 64204 93613) which runs north, before turning east to run along the side of numbers 12 and 13 Furnival Close, in a very shallow open channel, which then enters via a culvert inlet into a STW maintained public sewer system (225mm diameter (dia) surface water sewer) where the watercourse meets the footpath, as illustrated in Figure 15-3. This connects into a 225mm dia STW public surface water sewer beneath Kilby Road and runs east to where it connects into a 225mm dia STW combined sewer located to the south of Wolsey Close.

ORDINARY WATERCOURSE 4

A fourth un-named tributary of Fleckney Brook (Ordinary Watercourse 4) originates on the east side of Forge Close and converges with Fleckney Brook downstream of the village at OSNGR SP 65132 93888. The FEH does not provide a discrete sub-catchment area for this tributary, however the combined catchment area of this with Fleckney Brook increases to 4.16km^2 at this confluence.

1.



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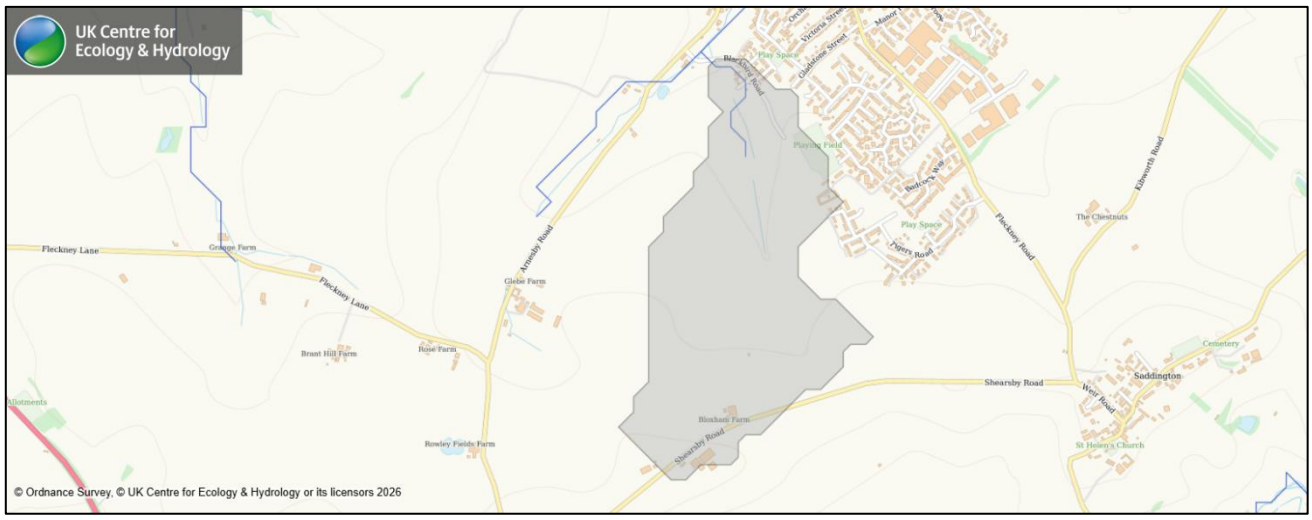

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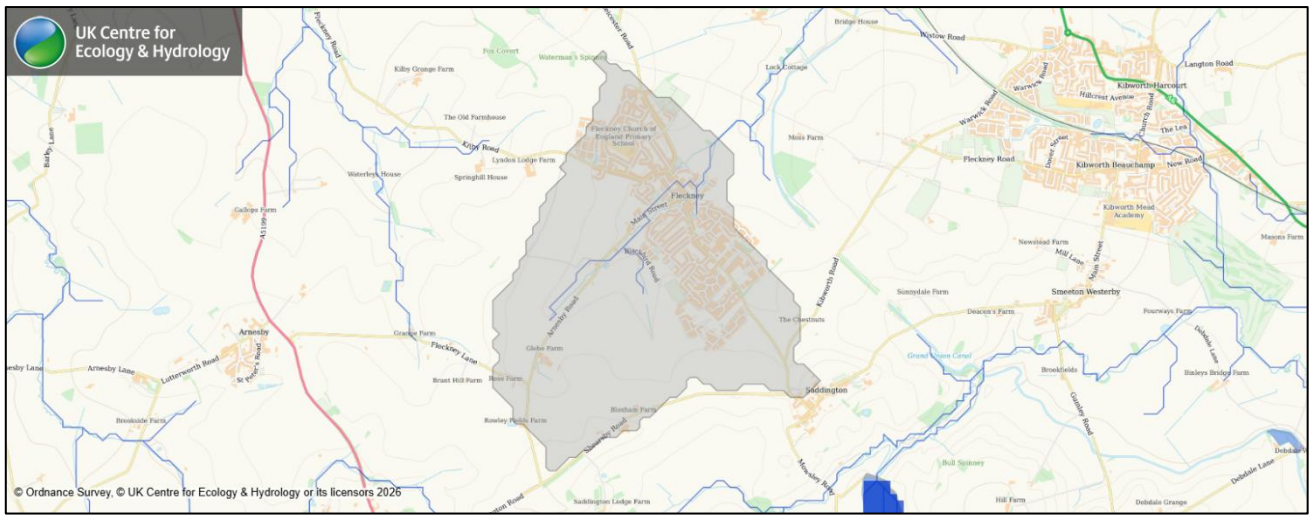

Figure 15-2: Fleckney Brook FEH Web Service Catchment Extents upstream of Blackbird Road (1.), Ordinary Watercourse 1 (2.), and downstream inclusive of Ordinary Watercourses 2 and 4 (3.)

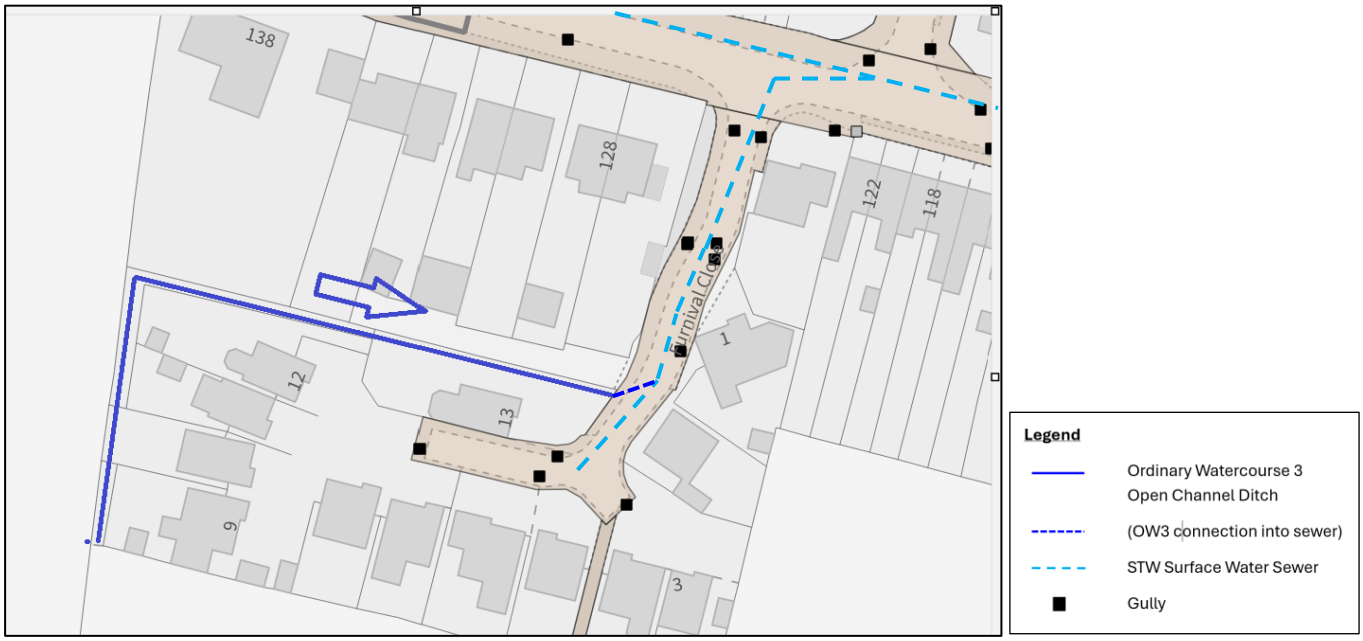

Figure 15-3: Ordinary Watercourse 3 at Furnival Close

15.1.1 GEOLOGY

The BGS online mapping system[2]Error! Bookmark not defined. identifies that this area of L eicestershire is dominated by the mudstone lithology, characterised by superficial deposits of predominantly alluvium-clay, and a bedrock of mudstone. These ground formations are associated with relatively poor permeability, poor infiltration rates, with a high susceptibility to groundwater flooding and fluvial deposits in close proximity to the watercourse.

[2] British Geological Survey (2026) BGS Geology Viewer. https://geologyviewer.bgs.ac.uk/

15.1.2 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. The EA Flood Map for Planning (NaFRA2) identifies that Flood Zones 2 and 3 are associated with this ordinary watercourse. The EA's Risk of Flooding from Surface Water (RoFSW) map (NaFRA2) also identifies that there is also a high, medium and low risk of surface water flooding across the village as illustrated in Figure 15-4.

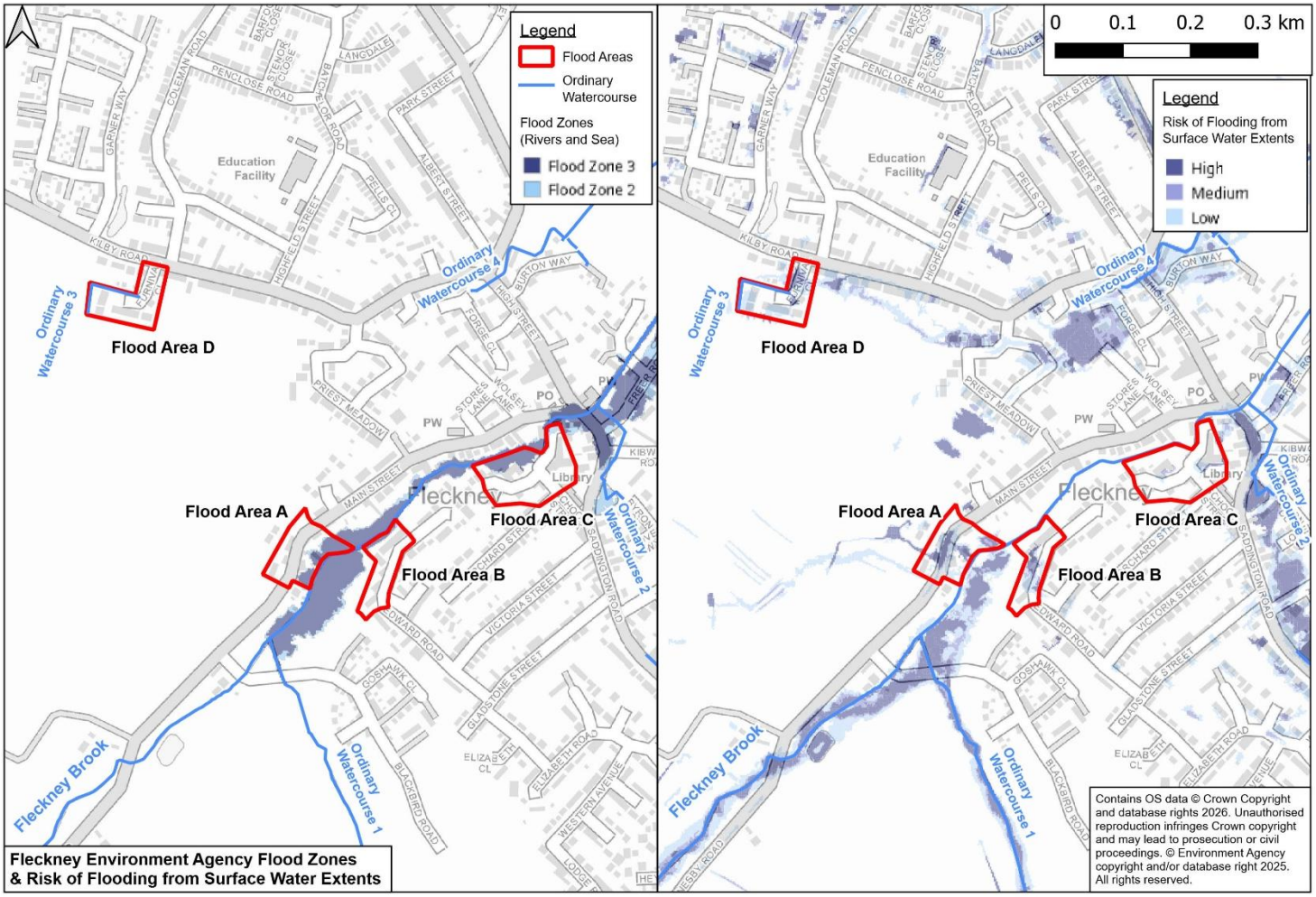

Figure 15-4: Fleckney EA Flood Map for Planning Flood Zones[3] and Risk of Flooding from Surface Water Extents[4] in Flood Areas (INSET 14)

15.1.3 HYDROMETRY

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

[3] Environment Agency (2026) Flood Map for Planning – Flood Zones https://flood-map-for-planning.service.gov.uk/map
[4] Environment Agency (2026) Risk of Flooding from Surface Water map. https://check-long-term-flood-risk.service.gov.uk/map

15.1.4 FLOOD WARNINGS

There are no Flood Warning Areas covering Flood Areas A to D, specifically as they are not within any flood extents of any Main Rivers for which the EA are responsible. The Fleckney Brook (downstream of Fleckney) does benefit from EA Flood Alerts, however, these do not cover Flood Areas A to D.

15.2 WHAT HAPPENED AND WHY?

WHO OR WHAT WAS AFFECTED?

4 properties reported as internally flooded

At least 2 properties reported as externally flooded

Given the significant intensity and the resultant volume of rainfall that fell within the catchment and the ground conditions prior to the event, a large volume of overland surface water runoff occurred which worked its way towards Fleckney Brook, overwhelming the local drainage network and significantly impacting the highway and properties.

15.2.1 FLOOD AREAS A, B & C

Water levels in Fleckney Brook and the unnamed ordinary watercourses rose sharply overspilling their channel banks as a result of channel capacity exceedance. Properties that flooded internally from Fleckney Brook in Main Street (one in Flood Area A and one in Flood Area B) and The Parade (one in Flood Area C) are located within or in close proximity to the EA's Flood Zone 2 and 3 extents (high and medium risk respectively) (Figure 15-4) related to Fleckney Brook. Floodwater overspilled the banks of Fleckney Brook, proceeded through rear gardens towards Main Street and overspilled the channel banks at The Parade impacting the Village Hall. Flood depths breached property thresholds.

Flood Area A, B and C are illustrated in Figure 15-4 as also being at low to high risk from surface water flooding. Surface water was reported to have originated off land to the north of Arnesby Road (some of which is ridge and furrow which would have exacerbated channelling of surface water towards the road), entered onto Main Street and headed towards Fleckney Brook (close to the Blackbird Road attenuation pond). One additional property on Main Street is believed to have been flooded internally from the rear due to runoff from the fields.

Road drainage networks in these Flood Areas discharge directly to Fleckney Brook. Outfalls likely became submerged below the higher water levels of the brook during Storm Henk, which would have likely impacted the ability of the networks to drain the volume of surface water during the event. This would have resulted in ponded water on the highways once the capacity of the network became exceeded. This is understood from the evidence gathered to be the case in Fleckney in Flood Area A, B and C in combination with the watercourse

overspilling.

During the investigation, anecdotal reports were made of natural springs on the agricultural land between Kilby Road and Main Street/Arnesby Road. BGS mapping indicates that the land is susceptible to groundwater flooding. In addition, after the event, as part of investigations in relation to a recent local planning application, a spring was identified on this area of land. The preceding wet weather conditions, as detailed in Section 2.1 of the main Storm Henk report, would have likely resulted in perched groundwater which could have been mistaken for surface water overland flow.

Anecdotal reports were made of overgrown vegetation within Fleckney Brook adjacent to the Baptist Church and also just downstream on the Howlett Road development site. No evidence has been found by Leicestershire County Council (LCC), the Lead Local Flood Authority (LLFA), to indicate that overgrown vegetation increased the number of properties that internally flooded, although it is possible it may have increased the extent of flooding locally.

Recognising the heightened concerns of the community following the flood event (despite the section of watercourse being privately owned) as a gesture of goodwill, the Local Highways Authority (LHA) conducted some channel maintenance at this location on 25th October 2024 (see Photograph 15-1 before and Photograph 15-2 after maintenance was completed). This work was completed with the key aim of improving conveyance within the watercourse to allow the highway drainage to outfall more efficiently. Following Storm Henk, Fleckney Parish Council also undertook clearance works on Fleckney Brook to help improve conveyance and this includes sections alongside the development compound at Howlett Road.

Photograph 15-1: Fleckney Brook alongside Main Street looking downstream (near the junction with High Street) before channel maintenance

Photograph 15-2: Fleckney Brook alongside Main Street looking upstream (near the junction with High Street) after channel maintenance

15.2.2 FLOOD AREA D

Anecdotal reports were received of significant volumes of surface water running over fields towards properties to the rear of Furnival Close (Flood Area D). The surface water was

described to enter Ordinary Watercourse 3, then proceed towards the culvert inlet to the STW public sewer system on Furnival Close, as illustrated in Figure 15-3.

Water was described to overwhelm the watercourse and overtop onto the 'jitty' (a privately owned access track to garages for properties on Kilby Road, adjacent to Furnival Close). Flooding continued towards Furnival Close where it pooled and flowed to the natural low point around a residential property. This property was surrounded and flooded internally from both the front and rear as the garden is walled and so it is likely that this stopped the water from flowing on further and increased the depth of flooding.

Anecdotal reports stated that in Furnival Close, highway drainage was originally taking water away but then they backed up and water rose (surcharged) out of gullies during the event. The highway drainage system connects onto the STW public sewer system at this location. Typically, road drainage networks are designed to accommodate limited rainfall event on the contributing area of highway itself, but not for any additional volumes of overland flow originating from land adjacent to the highways, or overtopping onto them from watercourses, as occurred here.

Following Storm Henk, STW conducted a camera survey of the public sewer network at this location and found it to be clogged with debris, this has since been jetted and cleared. It is highly likely that some of this material was mobilised and washed down during the flood event. No reports of any blockages were made to LCC or STW prior to Storm Henk. If the STW public sewer system became obstructed, then this could have impacted the gullies being able to effectively drain the highway and potential surcharging. A collapsed drain was also identified at the junction of Furnival Close and Kilby Road, this has since been rectified by STW but at the time could have also contributed to the flooding of the sewer network initially.

Regardless of any obstructions, the sheer volume of rainfall that fell during the event would have overwhelmed the entire drainage network including the public sewer network. The flooding at Furnival Close closely matches with the areas identified by the EA's surface water flood map (Figure 15-4) with properties and the highway in this area being identified as being at low, medium and high risk of surface water flooding.

15.3 WHAT HAS BEEN DONE?

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 Fleckney to date is provided in Section 15.4; many of these have been completed and are underway.

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.

15.4 FLECKNEY 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 Strategy[5].

15.4.1 SHORT-TERM ACTIONS (0 - 6 MONTHS)

ACTION	ACTION DETAIL	LEAD RMA	CURRENT STATUS
Site Walkovers to inform Investigation	Officers from HDC and LCC LLFA completed a number of site visits within the village following the flood event to review key locations affected within the community.	LCC LLFA / HDC	Complete
Assessment of Local Development	Review the approvals relating to the access culvert of the development at Howlett Road to ensure it was installed with correctly with appropriate permissions.	LCC LLFA / HDC	Complete

[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
Ordinary Watercourse Inspection and Maintenance	Review the condition of and liaise with riparian landowners regarding works to mitigate future flooding on Fleckney Brook including: • section on Main Street adjacent to the Fleckney Baptist Church • section adjacent to Howlett Road Review and liaise with riparian landowners of Ordinary Watercourse 3 regarding works to mitigate future flooding.	LCC LLFA STW	Complete Complete
Riparian Responsibilities Campaign	Engage with landowners throughout Fleckney to ensure they are fully aware of their riparian maintenance responsibilities. Advice to support riparian owners to understand their rights and roles in maintaining a watercourse is available online at Your watercourse rights and roles[15]. Establish landownership of the section of the 'jitty' where two private gullies are situated.	LCC LLFA LCC LLFA	Complete Not yet complete

ACTION	ACTION DETAIL	LEAD RMA	CURRENT STATUS
Public Sewer Network Maintenance and Investigations	Conduct maintenance works and camera survey to the public sewer network at Furnival Close.	STW	Complete
	Conduct wider investigation work into the function of the public sewer network at Furnival Close.	STW	Complete There are currently no plans to upsize the public sewer network infrastructure at this location.
	Revise maintenance plan to the sewer network at Furnival Close	STW	Ongoing

<table>
<tr><th>ACTION</th><th>ACTION DETAIL</th><th>LEAD RMA</th><th>CURRENT STATUS</th></tr>
<tr><td>Highway Asset Maintenance and Investigation</td><td>Undertake maintenance activity to the highway drainage network including:
gully cleansing and drain repairing on Kilby Road
gully replacement at The Springs
Completed targeted gully cleansing (in addition to routine maintenance) after Storm Henk across Fleckney (and many other affected parts of the County).

The data collected from this process was used to help reprioritise gully cleansing in flood affected areas. The specific roads pertaining to Fleckney as detailed in the table below were reviewed and the frequency of cleanse increased.

Priority (P) 1 – Cleansed every 10 months, P2 – Cleansed every 20 months, P3 – inspected every 24 months

<table><tr><th>Location</th><th>Priority</th></tr><tr><td>Wolsey Lane</td><td>P2 - P1</td></tr><tr><td>The Springs</td><td>P2 - P1</td></tr><tr><td>Furnival Close</td><td>P3 - P2</td></tr><tr><td>Church Lane</td><td>P2 - P1</td></tr></table></td><td>LCC LHA</td><td>Complete</td></tr>
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