

Section 19 Flood Investigation Report

Date: 20th May 2025

Section 19 Flood Investigation Report: Broughton Poggs, Lechdale, Oxfordshire

Date of Flood Incident: 24th November 2024

Revision Schedule

Version	Date	Details	Author	Checked	Approved
1	07/04/2025	Draft Section 19 Flood Investigation Report	V. Lander	-	-
1.1	20/05/2025	Revised Draft Section 19 Flood Investigation Report	V. Lander	C. Brown	-
1.2	17/07/2025	Revised Draft Section 19 Flood Investigation Report based on RMA comments	V. Lander	A.Dimaline	C Mills (OCC)
1.3	03/09/2025	Final Section 19 Flood Investigation following OCC review	V. Lander	L. Purbrick	C Mills (OCC)

Executive Summary

This Section 19 Flood Investigation Report has reviewed the flooding that occurred in Broughton Poggs on the evening of 24th November 2024, in accordance with the duties of Oxfordshire County Council as Lead Local Flood Authority under the Flood and Water Management Act 2010.

The flood event followed intense and prolonged rainfall associated with Storm Bert, during which the Oxfordshire area received approximately 70–80% of its average monthly rainfall within a three-day period.

Flooding in Broughton Poggs affected multiple properties, with internal flooding reported in residential dwellings and a commercial warehouse, and road access to the village cut off at the A361–B4477 junction.

The flooding was caused by a combination of factors, notably including a blockage in a key culvert, restricted or inadequate drainage capacity, and out-of-bank overland flows from the north. Water overspilled onto the B447 just north of the village, resulting in surface water entering adjacent properties.

A joint site visit was undertaken in February 2025 by representatives of Oxfordshire County Council and West Oxfordshire District Council. The key flood mechanisms were identified as:

- Blockage and limited conveyance within the piped section of Watercourse 3;
- Overland flow convergence from the Broadwell Brook and its tributary near the B4477;
- Overtopping of the Broughton Hall pond due to insufficient outfall capacity;
- Modified or unsuitable highway drainage connections along the eastern stretch of the B4477; and
- Low kerbs and thresholds allowing easier ingress of surface water into properties.

This report presents a number of recommendations for further investigation, maintenance, and potential improvement works to help reduce future flood risk in Broughton Poggs.

Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
General		
Raise and discuss the issues and recommendations within this report at the periodic multi agency meetings. Invite the Parish Council and flood working group along to specific meetings to discuss issues in more detail.	Lead Local Flood Authority (LLFA)	All Authorities
Periodically review the frequency of maintenance of highway drainage assets, and ensure frequency of cleansing is in line with the current Countywide Highway Maintenance Programme and funding.	OCC Highways	
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs.	Homeowners, WODC, EA, OCC	Homeowners WODC, EA, OCC
Local community volunteer approaches to improve the community's ability to plan, respond and recover from flooding; link to local community emergency plans.	All Communities and residents	All Communities and residents
Site-specific		
Survey the 300mm culvert along the B4477 to confirm condition, alignment, and capacity for potential upgrades or maintenance.	LLFA, OCC Highways	
Explore opportunities to de-culvert Watercourse 3 and use surface features to slow and store floodwaters.	Landowners, LLFA, OCC Highways	Landowners
Riparian owners are responsible for maintaining ditches and watercourses on their land to ensure the unobstructed flow of water and prevent flooding. Where obstructions are identified,	Landowners who are riparian owners	

riparian owners should address and remediate these.		
Investigate upstream flood storage options, such as bunds or attenuation basins, to reduce flow volumes entering the village during high rainfall events.	Parish Council, LLFA, Landowners	Landowners
Review and improve highway drainage infrastructure, particularly along the eastern stretch of the B4477, where current arrangements do not appear to be functioning effectively.	OCC Highways	LLFA
Broughton Hall pond: explore opportunities to improve efficiency of flow controls and/or lowering permanent water level.	Landowners	LLFA, EA
Implement property-level protection measures, including flood gates, raising thresholds where feasible or raising kerbing.	Homeowners, OCC Highways	LLFA
Seek opportunities to undertake hydraulic modelling to better understand flow interactions and the effectiveness of potential interventions.	Landowners, LLFA	EA

CONTENTS

1. INTRODUCTION	1
1.1. Lead Local Flood Authority (LLFA) Investigation	1
1.2. Site Location and context	2
1.3. Site Hydrology	2
1.4. Previous flood events	5
2. RECENT FLOOD ISSUES AND INVESTIGATION.....	6
2.1. Recent flood events	6
2.2. Rainfall data analysis	6
2.3. Local Hydrology	7
2.4. Site visits and observations.....	8
2.5. Flooding mechanisms	13
2.6. Recommendations	14
3. SUMMARY AND CONCLUSIONS.....	15
4. RIGHTS AND RESPONSIBILITIES.....	17
4.1. Communities and Residents	17
4.2. Lead Local Flood Authority (LLFA).....	17
4.3. Highway Authority (Oxfordshire Highways)	18
4.4. Water Authority - Thames Water Utilities (TW).....	18
4.5. West Oxfordshire District Council.....	19
4.6. Environment Agency (EA).....	19
4.7. Land Owners and Developers.....	20
5. RECOMMENDATIONS.....	21
5.1. General	21
5.2. Main Recommendations	22
5.3. Communities and Residents	23
5.4. Lead Local Flood Authority (LLFA).....	24
5.5. Highway Authority (Oxfordshire Highways)	24
5.6. Water Authority Thames Water Utilities (TW).....	25
5.7. West Oxfordshire District Council (WODC)	25
5.8. Landowners and Developers	25
6. DISCLAIMER.....	27
ACRONYMS	27

USEFUL LINKS28

EA - Prepare your Property for Flooding:.....28

EA - Sign up for flood warnings:.....28

EA - Up to date information on flood alerts & warnings:.....28

Flood and Water Management Act 201028

USEFUL CONTACTS28

Environment Agency:28

Thames Water.....28

1. INTRODUCTION

1.1. Lead Local Flood Authority (LLFA) Investigation

Section 19 of the Flood and Water Management Act (F&WMA) states:

- 1) On becoming aware of a flood in its area, a Lead Local Flood Authority must, to the extent that it considers it necessary or appropriate, investigate: -
 - a. which risk management authorities have relevant flood risk management functions, and
 - b. whether each of those risk management authorities has exercised, or is
 - c. proposing to exercise, those functions in response to the flood.
- 2) Where an authority carries out an investigation under subsection (1) it must: -
 - a. publish the results of its investigation, and
 - b. notify any relevant risk management authorities.

The LLFA have a set criteria which determines when a S19 report is required. The criteria is set out below.

LLFA/OCC Criteria

- Internal flooding (excluding to basements) to five or more residential properties or businesses within an area of 1km².
- Internal flooding of a business premises employing more than 10 people within an area of 1km².
- Internal flooding (excluding to basements) of at least one property or business for one week or longer.
- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.

Caused a transport link to be impassable:

- Motorways, trunk roads, Class A and B highway closures shall all be investigated.
- Class C highways – 10 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.
- Class U highways – 24 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.
- All rail link closures shall be investigated.

Any flooding event that a risk management authority deems significant but does not meet the agreed thresholds should be put forward to the Agency flood group meeting for consideration.

1.2. Site Location and context

The village of Broughton Poggs, part of the Parish of Filkins and Broughton Poggs, is located in West Oxfordshire, approximately 3.5 km west of Carterton and 5 km northeast of Lechlade-on-Thames. The village sits immediately to the east of the A361, and is accessed via the B4477, which crosses the village east/west. The village of Filkins is immediately to the north.

1.3. Site Hydrology

The village lies within the River Thames catchment area and is traversed in a south-east direction by the Broadwell Brook, a tributary of the Thames. Within the village, the Broadwell Brook is classified as an ordinary watercourse, but it transitions to a designated main river immediately downstream of the A361 (Figure 1-1).

The Brook originates from fields to the north-west and receives its primary tributary just outside of Broughton Poggs to the north. The Brook crosses the A361 before continuing towards Broughton, and crossing under the B4477.

Following the 2007 flooding, a bund was constructed along this watercourse near Filkins (approximately 800m upstream of Broughton Poggs), to provide temporary flood storage. While this measure offers protection to Filkins, its direct benefit to Broughton Poggs is assumed to be more limited, due to its position upstream of a culvert that acts as a pinch point.

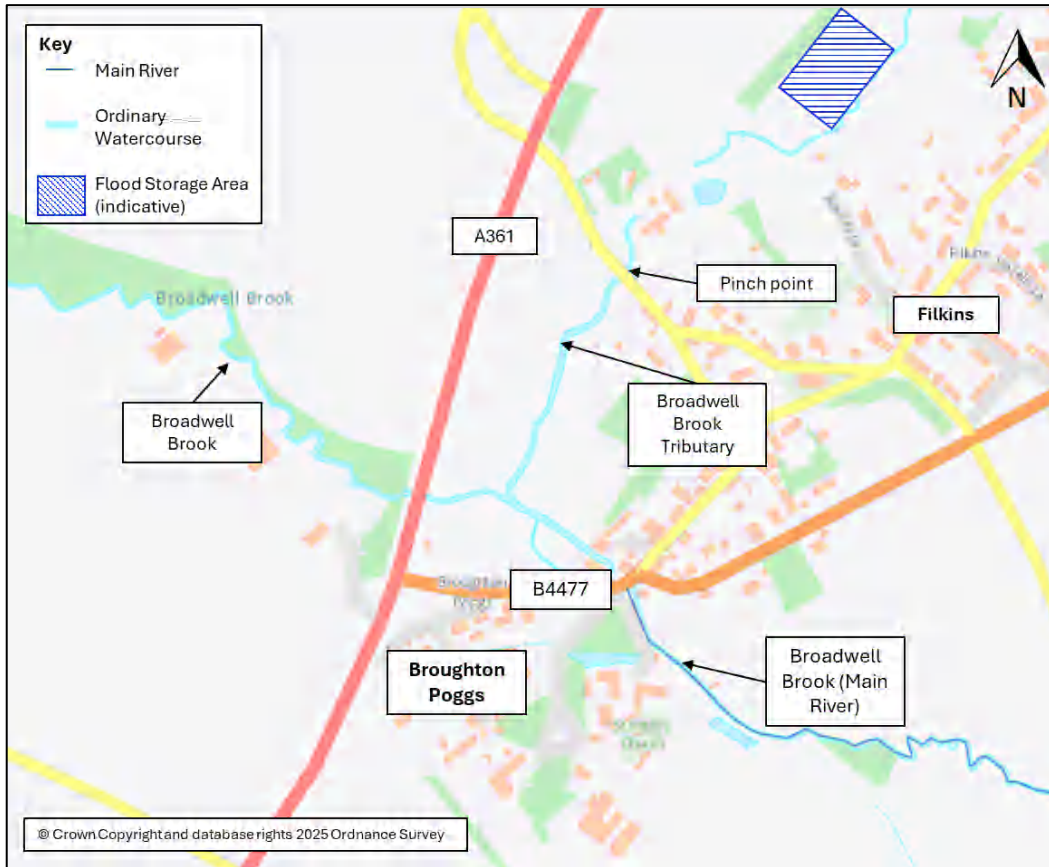


Figure 1-1– Site location and hydrological context

The local hydrology additionally consists of a system of ditches, channels and ponds, which are further detailed in Section 2.4 of this report.

The Environment Agency’s fluvial flood maps indicate that parts of the village fall within Flood Zones 2 and 3, associated with the Broadwell Brook and its tributary (Figure 1-2). Flood Zone 2 is defined as ‘land with a medium probability of flooding, having an annual probability of flooding between 0.1% and 1% from rivers or 0.5% and 0.1% from the sea. Flood Zone 3 is defined as ‘land with a high probability of flooding, with a 1% or greater annual probability of flooding from rivers or 0.5% or greater from the sea’.

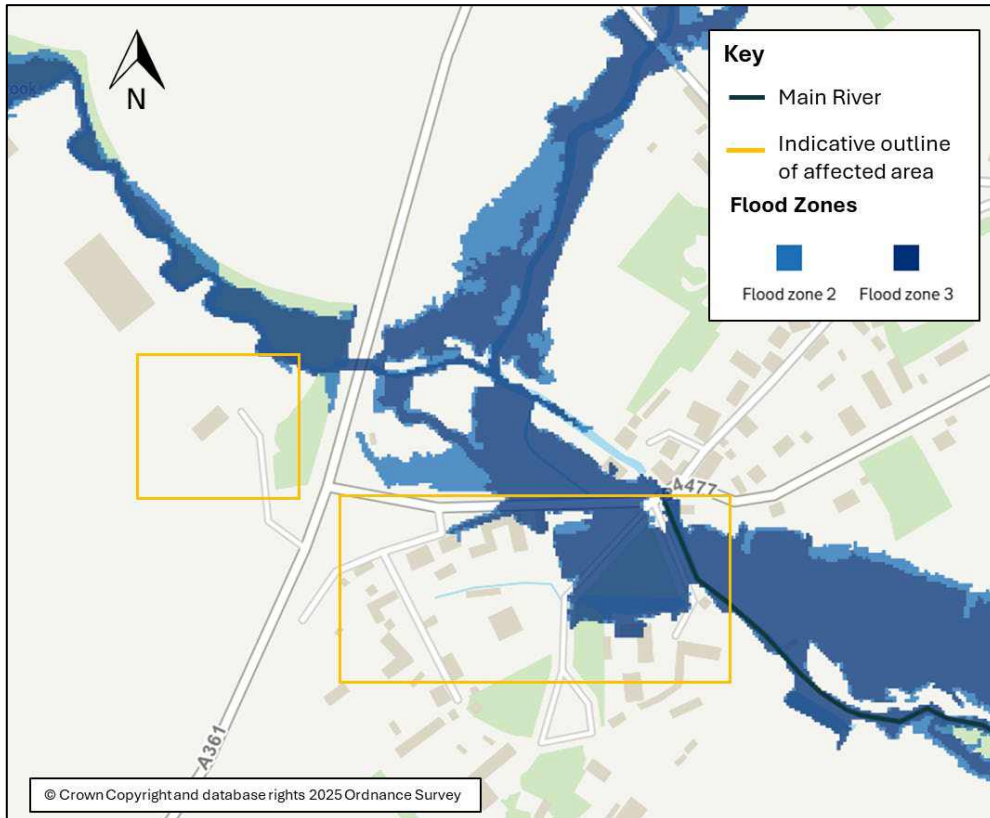


Figure 1-2– Environment Agency Flood Map for Planning

The Environment Agency’s surface water flood risk maps (Figure 1-3) identifies some areas within the village are at risk of surface water flooding, primarily along local ditches and watercourses, as well as low-lying spots.

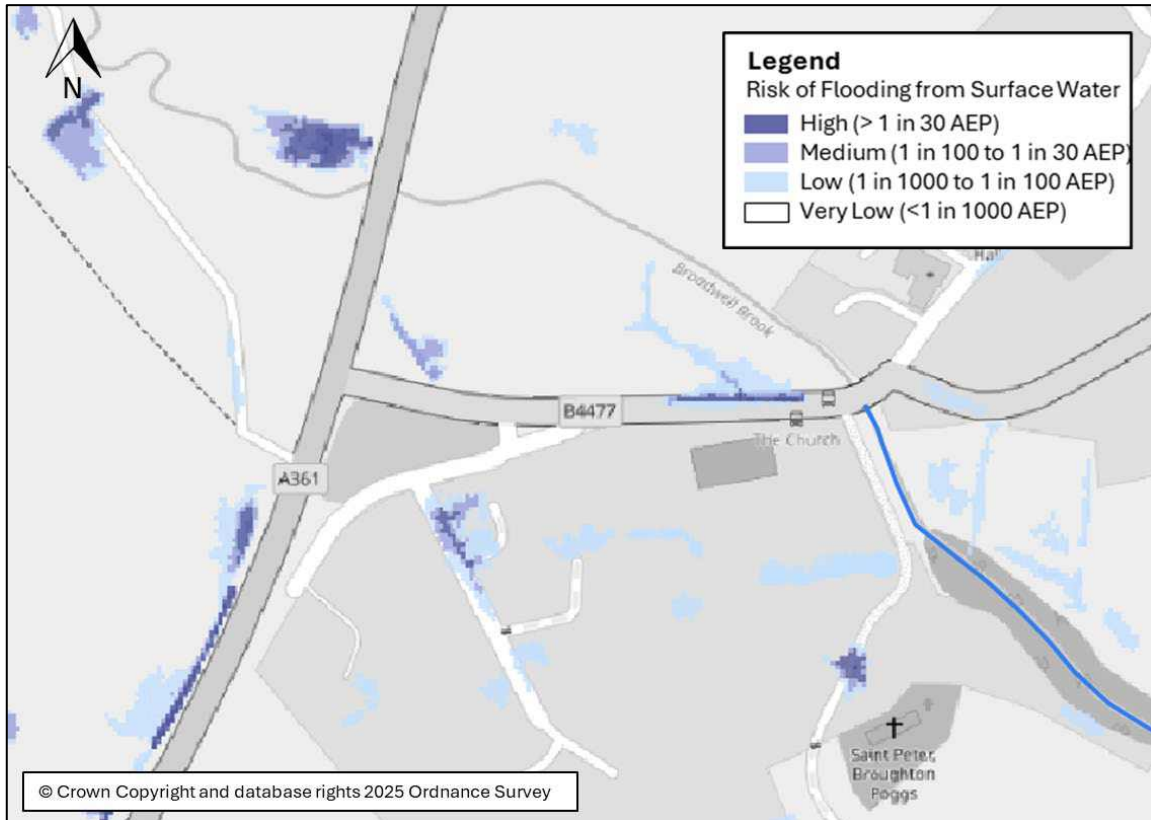


Figure 1-3 – Environment Agency Risk of Flooding from Surface Water

1.4. Previous flood events

The main recorded flood event affecting the village of Broughton Poggs took place in July 2007. Intense storms on 20/07/2007 on an already saturated catchment led to significant surface water runoff and the overtopping of the Broadwell Brook, resulting in the flooding of properties and infrastructure. Flooding in this area was also reported in 2013, although properties were affected to a lesser extent.

2. RECENT FLOOD ISSUES AND INVESTIGATION

2.1. Recent flood events

A recent flooding event took place on 24th November 2024. The B4477 and A361 junction experienced substantial flooding, cutting off access to the village and overflowing onto properties in the vicinity. Several homes and businesses suffered internal flooding, with reported water depths reaching between 12 to 24 inches (30-58 cm) in some buildings. One commercial warehouse was also impacted. Several power outages were reported.

Most properties reported experiencing rapid water ingress in the evening, peaking within a few hours before draining by morning. Reportedly, flooding subsided quickly at the front of the village when a key culvert blockage was cleared.

The flooding was reportedly caused by heavy rainfall, agricultural runoff, and river overflow, exacerbated by blocked culverts and insufficient capacity of the highway drainage system.

2.2. Rainfall data analysis

An analysis of Storm Bert (22-25 November) by the Met Office stated that the Oxfordshire area received circa 70%-80% of the whole-month average rainfall during this 3-day period.

The Environment Agency rain gauge in Worsham, approximately 8km south of the village, recorded 26.9mm of rainfall on 23/11/2024, followed by 38.5mm on November 24/11/2024, as shown on Figure 2-12 below.

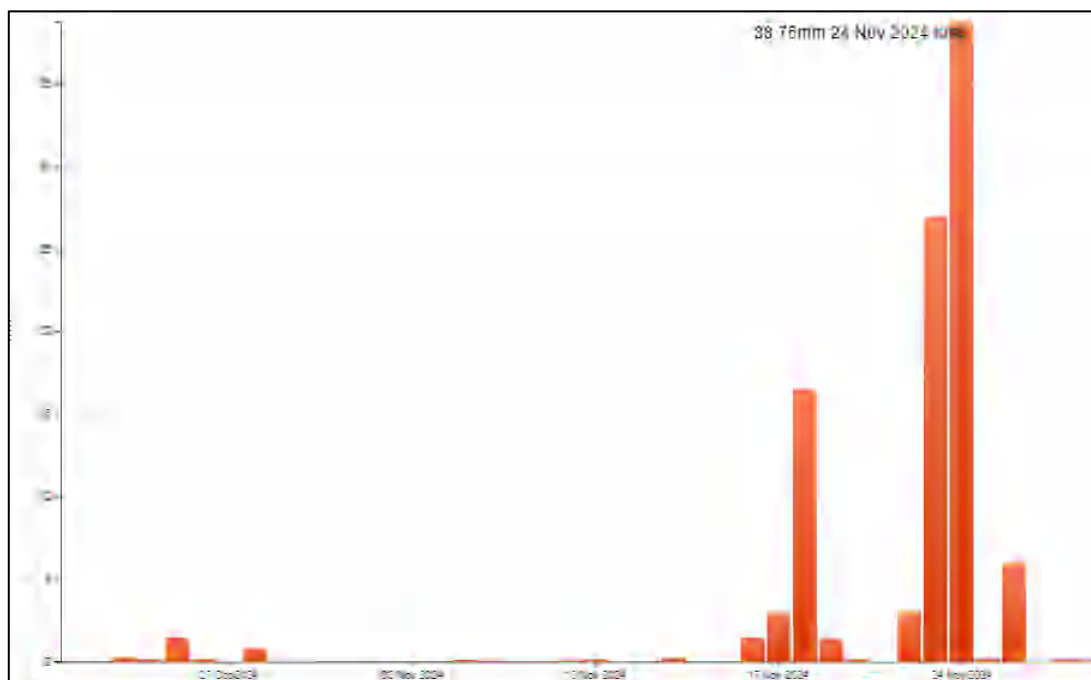


Figure 2-1 Daily rain totals (mm) for October- November 2024 (Source:DEFRA, Hydrology Data Explorer, Worsham Rain gauge)

2.3. Local Hydrology

As described in Section 1, the village is located along the Broadwell Brook, which is fed by a tributary joining just north of the village. The local hydrology additionally consists of a system of ditches, channels and ponds (described in Table 2-1 and depicted in Figure 2-2 below), all of which ultimately contribute flows to the Broadwell Brook. These watercourses are numbered for reference, with the numbering used throughout the following sections of the report.

Table 2-1 Description of Watercourses in Broughton Poggs

	<p>Broadwell Brook (1): the Brook enters the village from the west, crossing beneath the A361 through a double-arched culvert. The watercourse flows east and crosses the village under a bridge on the B4477.</p>			
<table border="1"> <tr> <td data-bbox="71 1556 367 1624"> <p>Key</p> <p>— Main River</p> <p>— Ordinary Watercourse</p> </td> <td data-bbox="367 1556 654 1624"> <p>— Bridge/Culvert</p> <p>— Culvert (assumed)</p> </td> <td data-bbox="654 1556 949 1624"> <p>— Pond</p> <p>— Direction of flow</p> </td> </tr> </table>	<p>Key</p> <p>— Main River</p> <p>— Ordinary Watercourse</p>	<p>— Bridge/Culvert</p> <p>— Culvert (assumed)</p>	<p>— Pond</p> <p>— Direction of flow</p>	<p>Northern Tributary (2): the watercourse joins the Broadwell Brook circa 100m north of the B4477.</p>
<p>Key</p> <p>— Main River</p> <p>— Ordinary Watercourse</p>	<p>— Bridge/Culvert</p> <p>— Culvert (assumed)</p>	<p>— Pond</p> <p>— Direction of flow</p>		
<p>Figure 2-2 Description of Watercourses in Broughton Poggs</p>	<p>Ordinary Watercourse (3): branching from the Broadwell Brook to the west of the A361, the ditch flows beneath the A361 through a separate, diagonally-aligned, 800mm diameter culvert. It continues in open channel for a short stretch (around 30m) and is culverted shortly after into a pipe culvert, notably smaller than the culvert under the A361. This pipe is reported to continue circa 100m along the A4477 until it becomes open channel again and eventually joins the leat at Broughton Poggs Mill (4) and discharges into the Broadwell Brook.</p>			
	<p>Brook Mill Leat (4): An overflow leat/channel diverts excess water from Broadwell Brook (1). The channel runs parallel to the Broadwell Brook before joining watercourse 3 at Broughton Poggs Mill.</p>			
	<p>Broadwell Brook/B4477 Bridge (5): eventually all above watercourses converge into the Broadwell Brook, which goes under the B4477 bridge and becomes a designated main river downstream.</p>			
	<p>Spring-fed watercourse and ponds (6): A spring-fed watercourse rises within the grounds of Broctun House in the centre of the village and flows through a pond within the adjacent estate at Broughton Hall. It continues eastward and joins the Broadwell Brook downstream of the B4477 bridge.</p>			

2.4. Site visits and observations

A joint site visit was carried out on 25/02/2025 by an Engineering Consultant acting on behalf of Oxfordshire County Council (OCC) and officers from West Oxfordshire District Council (WODC). The following observations were made:

Broadwell Brook (1) at A361

- The culvert appeared to be in generally good condition; although silting was observed at the downstream end, which may affect its conveyance capacity over time.



Figure 2-3 Broadwell Brook Culvert outlet under A361

Watercourse 3

- Watercourse 3 crosses beneath the A361 via a 800mm culvert, which then outfalls into an open channel, approximately 1.5m wide. This channel is subsequently culverted again into a smaller pipe, estimated to be around 300mm in diameter.
- This transition between pipe sizes creates a hydraulic throttle, increasing the risk of backing-up and flooding at this location. Refer to Figure 2-4 below.



Figure 2-4 Watercourse 3 at the A361/B4477 Junction (Left: Culvert under A361 outlet; Centre: open channel; Right: Small diameter inlet.)

- In addition, detached root matting/ geotextile was observed on the river bed during the site visit. Residents reported that this material had blocked the inlet during the flood event, causing water to back up and overflow onto the adjacent road. Overland flows followed the road's gradient towards the T-junction and the properties located at the front of the village.



Figure 2-5 Detached Root Matting

- At some point during the flooding event, this matting was removed and floodwaters were seen to recede rapidly.

Overland flows from Broadwell Brook and its tributary

- Residents have reported that during high-order rainfall events, out-of-bank flows from the Broadwell Brook and its tributary flow south across the field forming visible flow-paths. This is consistent with the topography (obtained from LiDAR data), as well as the EA's flood mapping, identify two breach points and corresponding overland flow paths converging at a low spot near the B4477 (Figure 2-6).

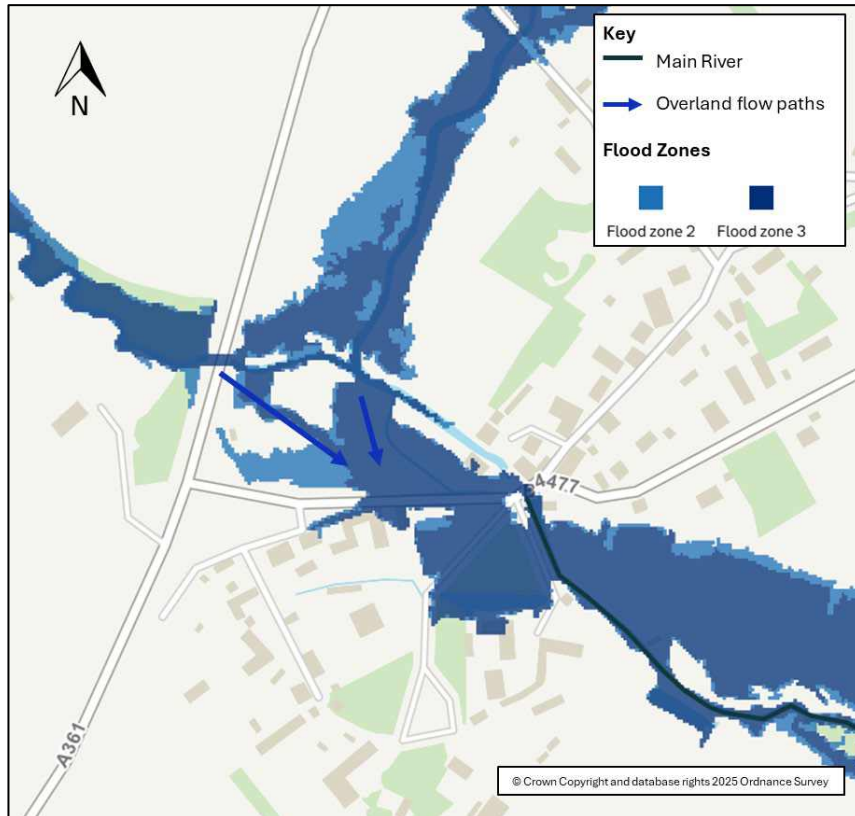


Figure 2-6 Overland flow routes

Confluence of watercourses 3 and 4

As described above, watercourses 3 and 4 converge to the north of the B4477, immediately to the north of a small stone wall that abuts the highway (Figure 2-7). This is also the location of convergence of the two flow paths described above. Site photographs show evidence of flood damage to the top section of the stone wall, likely caused by the accumulation of water at this point (Figure 2-7).



Figure 2-7 Confluence of watercourses 3 and 4 and observed damage to stone wall

Highway drainage

To the south of the stone wall, along the B4477, considerable ponding was observed along the B4477 during the site visit, as well as further damage to the wall. It was noted that no gullies are present on this section of the road. However, dropped kerbs were seen at low points, likely intended to direct surface water into the adjacent watercourse (Figures 2-8 and 2-9). However, this system does not appear to function adequately due to obstruction from the stone wall and levels.



Figure 2-8 Highway Drainage Issues



Figure 2-9 Highway drainage (Google images, 2016) (Left: Dropped kerb with no apparent outfall; Right: Hole through wall acting as outfall)

- 5. Broadwell Brook at the B4477 Bridge:

During the flood event, residents reported water levels rising to near the soffit of the B4477 bridge. While no overtopping or flooding occurred at this location, it was observed to be close to capacity.

The bridge structure itself is relatively low (Figure 2-9). While regular inspection and if needed maintenance is encouraged to help maintain flow, the underlying issue is the combination of high flows and a low bridge structure, meaning the overall benefit of such maintenance is likely to be very limited during more extreme flood events.



Figure 2-10 B4477 Bridge (Left: view upstream; Right: view downstream)

A site visit was undertaken by Oxfordshire County Council Highways on 06 March 2025 . Their inspection report concluded that material had been washed away from around the bridge abutments and deposited towards the centre of the bridge span by up to 75mm but is probably having little adverse impact on river flows. It was recommended that the displaced material be repositioned or carefully removed to protect the structural integrity of the bridge

Spring-fed watercourse and Broughton Hall pond (6)

The pond at Broughton Hall was reported to have overtopped during the flooding event. Under normal conditions, the pond discharges via a weir, which overflows into a narrow, hand-dug channel. Flows in the channel are collected by a 150mm pipe, which is again piped under the footpath by a 225mm pipe, ultimately discharging into the Broadwell Brook downstream of the B4477 bridge.



Figure 2-11 Flow controls and downstream pipework from Broughton Hall Pond

There are therefore two flow controls within the system, the weir and the downstream pipework, which do not allow the system to convey water quickly enough during high-flow events, in addition to the pipework under the footway.

Kerbs and thresholds

As highlighted in the 2008 report, kerb heights across the village are often low, and this would have allowed surface water to spill more easily over pavements and into properties. In addition, insufficient fall from property thresholds to the carriageway was noted.

2.5. Flooding mechanisms

Flooding occurred as a result of a combination of factors (annotated indicatively in *Figure 2-1312*). The primary contributors to the flood event are summarised below:

- Blockage and limited conveyance capacity in the piped section of Watercourse 3.
- Two overland flow paths originating from the Broadwell Brook and its northern tributary, which converge just north of the stone wall. This is also where Watercourses 3 and 4 converge, leading to the accumulation and pressure of surface water in one localise area. The combined flows are believed to have overtopped and damaged the stone wall, breaching onto the B4477.
- An ineffective highway drainage system along the eastern stretch of the B4477, where the absence of gullies and limited connectivity with adjacent watercourses resulted in prolonged surface water ponding.
- Overtopping of the Broughton Hall pond, attributed to inadequate flow capacity through the weir and downstream pipework, which was insufficient to convey water quickly enough from the pond into the Broadwell Brook.

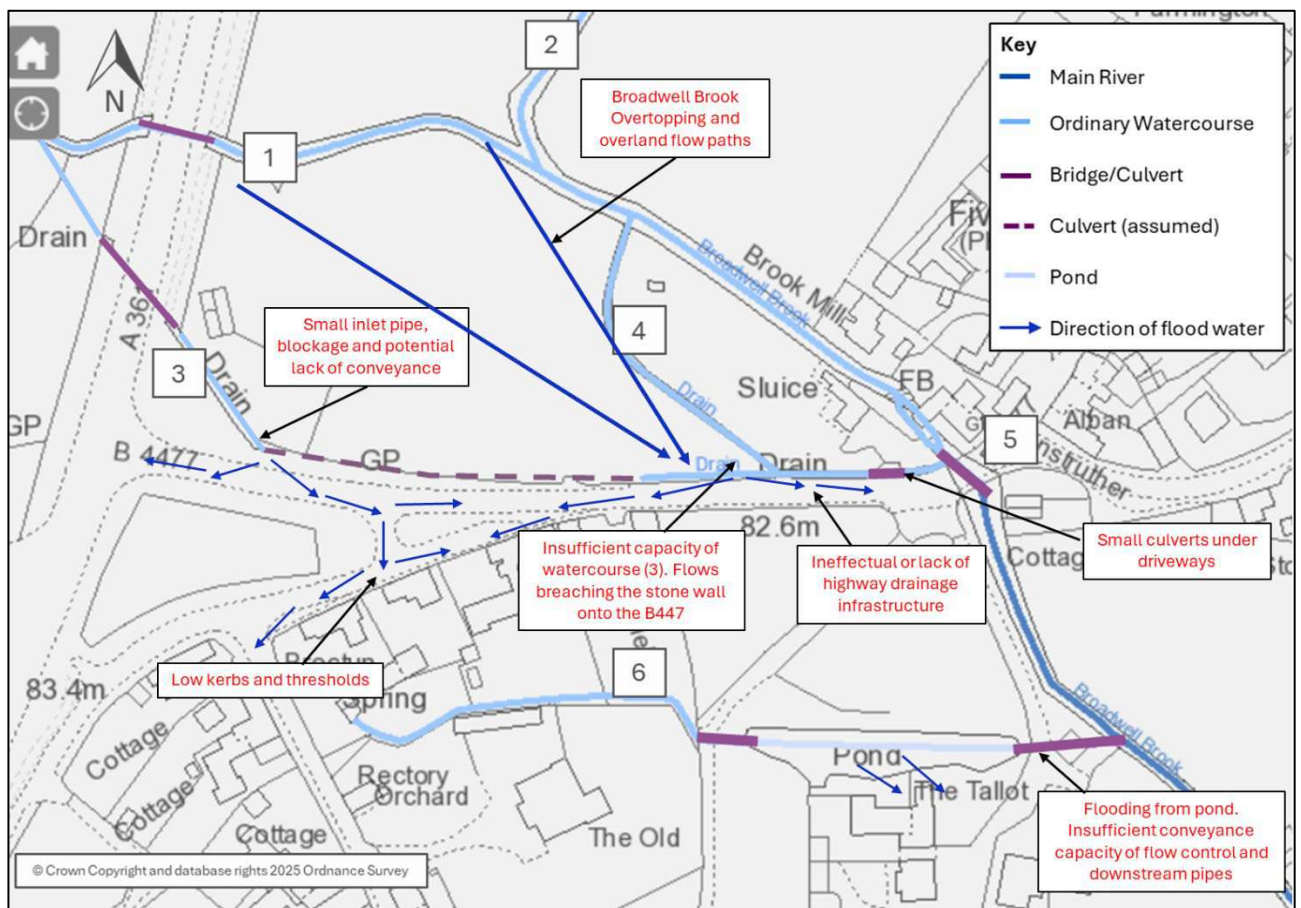


Figure 2-13 Causes of flooding

2.6. Recommendations

To reduce the risk of future flooding to the village and improve its ability to manage surface water during storm events, the following options are recommended:

- Riparian owners are responsible for maintaining ditches and watercourses on their land to ensure the unobstructed flow of water and prevent flooding. Where obstructions are identified, riparian owners should address and remediate these.
- Survey the 300mm culvert associated with Watercourse 3 to confirm its condition, capacity, and connectivity.
- Explore opportunities to de-culvert Watercourse 3 and create an open conveyance and attenuation feature (subject to agreement with landowners and Oxfordshire County Council as the Lead Local Flood Authority, the Highways Authority and the Local Planning Authority).
- Investigate upstream flood storage options, such as bunds or attenuation basins, to reduce flow volumes entering the village during high rainfall events.
- Review and improve highway drainage outlets along the eastern stretch of the B4477 (from 423401E, 203970N to 423523E, 203977N), where current arrangements do not appear to be functioning effectively.
- Broughton Hall pond: increase the outfall pipe diameter. Consideration of other options such as: permanently lowering the normal water level in the pond, or introducing staged-discharge flow control system (e.g., consider replacing the existing configuration with a hydrobrake or similar device).
- Implement property-level protection measures, including flood gates, raising thresholds where feasible or raising kerbing.
- Seek opportunities to undertake hydraulic modelling to better understand flow interactions and the effectiveness of potential interventions.

3. SUMMARY AND CONCLUSIONS

The flooding in Broughton Poggs on 24th November 2024 was caused by a combination of factors during a period of intense rainfall. The village's location along the Broadwell Brook, together with a network of tributaries, ditches, and culverted watercourses, creates several flow routes which increase local flood risk.

A key issue identified was the restricted capacity of Watercourse 3, particularly where it transitions from an 800mm culvert into a smaller pipe, which continues for a length of 100m to the north of the B4477. This pinch point, combined with reported blockages from root matting and debris, led to water backing up and overflowing onto nearby roads and properties.

In addition, two overland flow paths from the Broadwell Brook and its northern tributary were seen to converge near the stone wall along the B4477, where Watercourses 3 and 4 also meet. This localised concentration of surface water appears to have overtopped and damaged the wall, allowing water to flow onto the highway and towards nearby properties. Highway drainage at this location of the B447 was observed to be ineffective.

The pond at Broughton Hall also overtopped during the event, as the existing weir and downstream pipework did not have enough capacity to handle the volume of water during peak flows. Combined with the already constrained highway drainage — including a lack of gullies and poor connectivity to receiving watercourses — surface water was unable to drain efficiently from the road network.

Although no overtopping occurred at the B4477 bridge, residents reported that water levels came close to the soffit. A recent inspection also highlighted some scour and displaced material at the centre of the bridge.

Kerb heights across the village are often low, and many properties have minimal threshold upstand, meaning that once surface water breaches onto the road, it can more easily cause flooding.

In summary, the flooding resulted from multiple, interacting factors, including blocked or undersized infrastructure, limited capacity in both formal and informal drainage routes, and a concentration of flow at key low points.

4. RIGHTS AND RESPONSIBILITIES

4.1. Communities and Residents

Communities may consist of the Town or Parish Council, Flood Forum, Community Group and affected residents, amongst others.

Communities and residents who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected.

Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include [subscribing to MET Office email alerts](#) for weather warnings, nominating a Community Flood Warden, producing a community flood plan, implementing property level protection and moving valuable items to higher ground. Finally, individual households can create their own personal flood plans, such as collating important documents for quick removal from the property, torches, waterproof clothing etc.

Oxfordshire County Council has produced a number of flood guides covering various subjects, some of which relate to this type of flood incident. The relevant guides have been identified and are available at: www.oxfordshirefloodtoolkit.com

4.2. Lead Local Flood Authority (LLFA)

As stated within the introduction section, OCC as the LLFA has a responsibility to investigate flood incidents under Section 19 of the F&WMA.

The LLFA also has a responsibility to maintain a register of assets which have a significant effect on flooding from surface runoff, groundwater or ordinary watercourses (non-Main River) as detailed within Section 21 of the F&WMA. The register must contain a record about each structure or feature, including the ownership and state of repair. OCC is also required to keep a record of flooding hotspots across the county.

OCC's practices relating to third party assets is to notify third party owners of their asset forming part of a flood risk system, and assist by advising those third party owners on the condition of their assets and their maintenance responsibilities.

As Lead Local Flood Authority, OCC will be looking for support from other risk management authorities, communities and individual home owners to ensure flood incidents are reported, and any assets which have a significant effect on flood risk are recorded on the asset register.

While OCC can suggest possible causes of flooding, and make recommendations to ensure flood risk is mitigated as far as possible, the F&WMA does not provide OCC with the mandate or funding to act on identified causes of flooding or force risk management authorities to undertake any recommended actions.

4.3. Highway Authority (Oxfordshire Highways)

Oxfordshire Highways have a duty to maintain the highway under Section 41 of the Highway Act 1980 but subject to the special defence in Section 58.

New highway drainage systems are designed to Highways England's Design Manual for Roads and Bridges (Volume 4, Section 2). They are only required to be constructed to drain surface water runoff from within the highway catchment rather than from the wider catchment.

There are historic drainage systems in historic highways which can become the responsibility of the Highway Authority due to dedication, as opposed to adoption. These drainage systems may not have been designed to any standard.

Oxfordshire Highways undertake regular highway drainage cleansing. Identify and develop a detailed plan of their assets.

If flooding occurs OCC will assess the capacity of the highway assets and identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works should be considered.

Oxfordshire highways should assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities.

4.4. Water Authority - Thames Water Utilities (TW)

Water and sewerage companies are responsible for managing the risks of flooding from surface water, foul water or combined sewer systems. Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. However, in extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

Sewerage undertakers have a duty, under Section 94 of the Water Industry Act 1991, to provide sewers for the drainage of buildings and associated paved areas within property boundaries. Since the 1st October 2011 the majority of private sewers and lateral drains in England and Wales were transferred into public ownership, meaning they are now the responsibility of the relevant sewerage undertaker.

A public sewer is a conduit, normally a pipe that is vested in a Water and Sewerage Company or predecessor, that drains two or more properties and conveys foul, surface water or combined sewage from one point to another, and discharges via a positive outfall.

There is no automatic right of connection for other sources of drainage to the public sewer network. Connection is therefore discretionary following an application to connect.

4.5. West Oxfordshire District Council

District Councils have powers under Section 14 of the Land Drainage Act 1991 (LDA) to undertake flood risk management works on ordinary watercourses (non Main River) where deemed necessary.

Under Section 20 of the LDA, District Councils have the powers to (by agreement of any person and at that person's expense) carry out any drainage work which that person is entitled to carry out. Agreement may not be required in certain emergency or legally upheld situations.

West Oxfordshire District Council also has delegated authority from OCC/LLFA to serve notice on persons requiring them to carry out necessary works to maintain the flow of ordinary watercourses under Section 25 of the LDA and receives funding from the LLFA to do this.

The District Council is the Planning Authority and has a role in Building Control and the Building Regulations.

4.6. Environment Agency (EA)

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through national and strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery.

The EA also has operational responsibility for managing the risk of flooding from main rivers. Main rivers are usually larger river and streams and include all watercourses defined on the main river map which can be accessed at <https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/StatutoryMainRiverMap&Mode=spatial>

The responsibility for maintenance and repair of rivers lies with the riparian owner, but the EA have permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991 (WRA).

The EA encourage third party asset owners to maintain their property in appropriate condition and may take enforcement action on a prioritised basis where it is appropriate. They may also consider undertaking maintenance or repair of third party assets only where it can be justified in order to safeguard the public interest and where other options are not appropriate.

Further remit of the EA includes;

- preparing preliminary flood risk assessments and flood risk management plans for flooding from main rivers, reservoirs and the sea (Flood Risk Regulations 2009)

- warning and informing (Ministerial Direction to the National Rivers Authority, 1996)
- regulating activities that may affect the risk of flooding from main rivers (Environmental Permitting Regulations (England and Wales) Regulations 2016)
- Carrying out surveys and mapping (Flood Risk Regulations 2009, Water Resources Act 1991)
- reporting to the minister on flood and coastal erosion risk and how the national and local strategies are being applied by all of the authorities involved (FWMA, 2010)
- acting as a statutory consultee for planning authorities providing advice on planning applications, local plans and environmental assessments regarding flood risk from main rivers and the sea (Town and Country Planning (Development Management Procedure) (England) Order 2015)

4.7. Land Owners and Developers

Land owners are responsible for the drainage of their land and controlling any movement of sediment from their land. Legally, owners of lower-level ground have to accept natural land drainage from adjacent land at a higher level. The exception to this is where the owner of the higher level land has carried out “improvements” such that the runoff from the land cannot be considered “natural”.

Agricultural practices by land owners can be considered as “improvements” to the land, so that cultivation of crops or other land uses can take place. Mitigation works are required on improved land to account for the change in natural land drainage and changes to surface water runoff this can create.

Land owners and developers are responsible for working with the Local Planning Authority to ensure that their development is completed in accordance with the planning permission and all conditions that have been imposed.

Advice for developers is available on the Oxfordshire Flood Toolkit.

www.oxfordshirefloodtoolkit.com/planning/developers/

5. RECOMMENDATIONS

5.1. General

Listed below are the recommendations emanating from this formal Section 19 Flood Investigation Report. All the actions are initial recommendations that require discussing in detail to determine their feasibility.

It is important to note that it is for the relevant responsible body or persons to assess each recommendation in terms of the legal obligation, funding, resource implications, priority and cost/benefit analysis of undertaking such action.

The recommendations may be included within the action plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programmes, as appropriate.

Authorities should work together Look into funding opportunities to carry out the listed actions. There are multiple funding sources which could contribute to schemes and improvement works going forward. The majority schemes will require elements of partnership working and contributions to be successfully funded. They are likely to need to provide multiple benefits such as improving flood resilience whilst also managing water levels, reducing drought risks, helping nature recovery as well as climate adaptation.

There are several funding options available which can be explored through multi agency working groups such as,

- Flood & Coastal Erosion Risk Management (FCERM) ○ Flood Defence Grant in Aid (FDGiA)
 - Local Levy Regional Flood and Coastal Committee (RFCC)
- DEFRA Natural Flood Management Funding
- Woodland Creation Grants
- Agricultural & Environmental Schemes (Countryside Stewardship)
- Funding sources relating to development and regeneration, such as section 106 agreements, Community Infrastructure Levy (CIL) and New homes bonus
- Non-government organisations and charitable trusts
- Community fundraising and events
- Lotteries (Heritage Lottery Fund, Big Lottery, Arts Council
- Volunteering
- Nature for Climate Fund
- Grants from other government departments, such as BEIS, MHCLG, DfT, DfE (for example, Flood Resilient Schools)
- UKRI – the research councils funding
- Business in the community
- Green recovery challenge fund
- Partnership funding (for example, contributions from partners, local authorities, businesses and communities etc.

5.2. Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
General		
Raise and discuss the issues and recommendations within this report at the periodic multi agency meetings. Invite the Parish Council and flood working group along to specific meetings to discuss issues in more detail.	Lead Local Flood Authority (LLFA)	All Authorities
Review the frequency of maintenance of highway drainage assets. If required, look to increase the frequency of cleansing in line with the current Countywide Highway Maintenance Programme and funding.	OCC Highways	
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs.	Homeowners, WODC, EA, OCC	Homeowners, WODC, EA, OCC
Local community volunteer approaches to improve the community's ability to plan, respond and recover from flooding; link to local community emergency plans.	All Communities and residents	All Communities and residents
Site-specific		
Survey the 300mm culvert along the B4477 to confirm condition, alignment, and capacity for potential upgrades or maintenance.	LLFA/ OCC Highways	
Explore opportunities to de-culvert Watercourse 3 and use surface features to slow and store floodwaters.	Landowners, LLFA, OCC Highways, WODC	Landowners
Riparian owners are responsible for maintaining ditches and watercourses on their land to ensure the unobstructed flow of water and prevent flooding. Where obstructions are identified, riparian owners should address and remediate these.	Landowners who are riparian owners	

Investigate upstream flood storage options, such as bunds or attenuation basins, to reduce flow volumes entering the village during high rainfall events.	Parish Council, Landowners	Landowners
Review and improve highway drainage infrastructure, particularly along the eastern stretch of the B4477, where current outlets/arrangements do not appear to be functioning effectively.	OCC Highways	LLFA
Broughton Hall pond: explore opportunities to improve efficiency of flow controls and/or lowering permanent water level.	Landowners	LLFA, EA, WODC
Implement property-level protection measures, including flood gates, raising thresholds where feasible or raising kerbing.	Homeowners, OCC Highways	LLFA, WODC
Seek opportunities to undertake hydraulic modelling to better understand flow interactions and the effectiveness of potential interventions.	Parish Council, LLFA, WODC	EA

5.3. Communities and Residents

Nominate Community Flood Wardens to help coordinate the following:

- Preparing Household Emergency Plans for vulnerable properties in this area.
- Regularly inspecting ditches and pipework in the area of flood risk. Report blockages or other issues to the landowner and the LLFA.
- Explore options for property level protection and implement any recommendations. This could include additional drainage at the rear of properties, self-sealing air bricks and flood barriers.

Information on Flood Prevention measures for Home Owners, Communities and Businesses can be found on the Flood Toolkit:

www.oxfordshirefloodtoolkit.com/risk/prevention

Residents should check whether they are at risk of flooding by using the long term flood risk service www.gov.uk/check-long-term-flood-risk. If they are at risk of flooding they should sign up for flood warnings by visiting [sign up for flood warnings.gov.uk](http://sign-up-for-flood-warnings.gov.uk).

Permanent measures such as installing floodgates, raising electrical sockets and using flood resistant material when doing building work should be considered. West Oxfordshire District Council, Oxfordshire County Council and the Environment Agency can provide advice on these matters and more information can be found at:

www.oxfordshirefloodtoolkit.com/emergency/preparation

<https://nationalfloodforum.org.uk/>

Explore community wide solutions (e.g. attenuation areas, overflow routes, tree planting). Use the Flood Toolkit Funding Tool to find sponsors who may be willing to help fund improvement projects: www.oxfordshirefloodtoolkit.com/risk/funding

Continue to report flood incidents to the Lead Local Flood Authority at: www.oxfordshirefloodtoolkit.com/emergency/report-flood. Endeavour to obtain as much evidence of flood events as possible, such as photographic and video evidence.

Residents to explore obtaining Government subsidised flood insurance via Can Flood Re help me? <https://www.floodre.co.uk/>

5.4. Lead Local Flood Authority (LLFA)

LLFA team to work with the Oxfordshire County Council Emergency Planning Team and the EA to set up and support a community-based Flood Warden Network.

Assist the Oxfordshire County Council Emergency Planning Team, the EA and other flood management authorities to support the community in the production of a Community Flood Plan and provide advice to residents on how to explore options for property level protection.

Inform owners of the drainage systems and watercourses within the overall surface water catchment area of their legal responsibilities.

Re-establish the Agency flood group meetings to discuss problems and to look at strategies to combat flooding due to Climate Change. Have periodic meetings with the local flood group to discuss the issues and recommendations with representatives from key authorities.

Work with WODC in looking at opportunities for schemes to manage flows upstream such as nature-based solutions through partnership working.

5.5. Highway Authority (Oxfordshire Highways)

Regularly check and maintain highway assets through Sunningwell in line with their current maintenance regimes. Add detailed information of the assets to the OCC Asset Register.

Assess the capacity of the highway assets with support from the LLFA and WODC to identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works must be considered.

Assess the suitability of third-party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities. Work with the community and LLFA to clarify ownership and maintenance responsibilities for watercourses, particularly where these are located within or near to the highway.

5.6. Water Authority Thames Water Utilities (TW)

Assess the sources of water entering the public sewerage system. Foul sewers to be checked for surface water connections, blockages and capacity issues. Remedial works to be carried out as necessary to minimise surface water entering the system and increase capacity.

Assess the capacity of their assets and identify any areas of insufficient capacity. Where this leads to flood risk to properties improvement work must be considered.

Ensure the existing foul system is not compromised from future development proposals.

5.7. West Oxfordshire District Council (WODC)

Continue to consult with the Environment Agency and Lead Local Flood Authority as required in respect of planning applications for new developments to reduce flood risk. Aim to ensure that all works are carried out in accordance with the approved plans and documents.

Review the planning policies relating to developments in the vicinity of the flooding incident, together with any flood risk assessments and drainage designs. Consider contacting the developers to take action in the event that any items relating to surface water drainage and flood risk are not evident or ineffective in the final developments or in the construction period.

Utilise their enforcement powers under Section 25 of the Land Drainage Act 1991 where it is considered that riparian owners are failing to maintain ordinary watercourses in their ownership.

Continue regular maintenance of their Ordinary watercourse Assets, in line with current maintenance regimes.

Endeavour to assist other flood risk management authorities and landowners in the preparation of a detailed plan of assets relating to drainage and flood risk, to share with the LLFA and the community.

Support landowners to investigate private drainage and check for blockages and defects with remedial works to be carried out where necessary.

Continue to support homeowners and businesses in providing individual property level protection.

5.8. Landowners and Developers

Developers should work with local authorities to ensure all development is completed in accordance with approved plans and documents, and planning policy.

Landowners should undertake regular inspection and maintenance of their drainage systems in accordance with a defined maintenance regime. Further, they should identify and develop a detailed plan of their assets to share with the LLFA, other flood risk management authorities and the community.

Landowners should assess the capacity of their drainage systems and identify any areas with insufficient capacity for the collection, conveyance, storage and disposal of surface water. Where this could lead to runoff to the public highway or nuisance to third party private property, improvement works should be considered.

Landowners who are riparian owners are responsible for carrying out work to maintain the natural flow of water in the relevant watercourse. Such work will include the removal of significant blockages and the removal of vegetation if it is causing premature flooding to third party land and or property.

Review the library of flood guides on the Oxfordshire Flood Toolkit.

Agricultural landowners should carry out works to their land to reduce surface water runoff. These include following principles of good soil husbandry and providing land drainage systems such as ditches (<https://www.gov.uk/guidance/create-and-use-a-soil-management-plan>).

These works help to retain the natural land drainage regime and provide the best soil conditions for the continued agricultural use of the land. Examples of good practice for reducing surface water runoff from agricultural land are:

- Ploughing fields in a perpendicular direction to the slope of the land, reducing the effect of channelling of water over the land when it rains
- Using techniques and machinery to limit compaction of soils
- Growing crops that match the capability of the land, particularly in relation to the timings of activities and not overworking soils through the year
- Providing new ditches, sub-soil drainage and outfalls, and reinstating and regularly maintaining existing ditches. Old existing ditches may be completely filled and difficult to see. The type of soil make-up, type of flora and overall lie of the land can help to determine the routes of filled in historic ditches
- Preventing changes to the levels of the land that would cause channelling of surface water to a single point where this would not naturally occur.

It should be noted that following good practice for managing surface water runoff cannot completely remove the risks of natural land drainage and the associated quantities and flow routes of runoff that can cause flooding.

6. DISCLAIMER

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

Any recommended actions outlined in this FIR will be for the relevant responsible body or persons to assess in terms of resource implications, priority and cost/benefit analysis of the proposal. Moving forward, these may be included in the Action Plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programme as appropriate.

The opinions, conclusions and any recommendations in this Report are based on information provided to West Oxfordshire District Council and Oxfordshire County Council.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and West Oxfordshire District Council and Oxfordshire County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the information in this report highlighting flooding to properties at a street level.

West Oxfordshire District Council or Oxfordshire County Council do not accept any liability for the use of this report or its contents by any third party.

ACRONYMS

WODC West Oxfordshire District Council
OCC Oxfordshire County Council
EA Environment Agency
TW Thames Water
FIR Flood Investigation Report
F&WMA Flood and Water Management Act 2010
LDA Land Drainage Act 1991
LLFA Lead Local Flood Authority
WRA Water Resources Act 1991

USEFUL LINKS

Highways Act 1980:

www.legislation.gov.uk/ukpga/1980/66/contents

Water Resources Act 1991:

www.legislation.gov.uk/ukpga/1991/57/contents

Land Drainage Act 1991:

www.legislation.gov.uk/ukpga/1991/59/contents

EA - Prepare your Property for Flooding:

How to reduce flood damage Flood protection products and services

www.gov.uk/government/publications/prepare-your-property-for-flooding

EA - Long term flood risk service:

<https://www.gov.uk/check-long-term-flood-risk>

EA - Sign up for flood warnings:

[Sign up for flood warnings - GOV.UK \(www.gov.uk\)](http://www.gov.uk/sign-up-for-flood-warnings)

EA - Up to date information on flood alerts & warnings:

[Check for flooding - GOV.UK \(www.gov.uk\)](http://www.gov.uk/check-for-flooding)

Oxfordshire County Council Flood and Water Management Web Pages:

www.oxfordshirefloodtoolkit.com

<https://www.oxfordshire.gov.uk/residents/fire-and-public-safety/emergency-planning/community-resilience>

Flood and Water Management Act 2010

<http://www.legislation.gov.uk/ukpga/2010/29/contents>

USEFUL CONTACTS

Oxfordshire County Council Highways:

Tel: 0345 310 1111

Website: www.fixmystreet.oxfordshire.gov.uk

Environment Agency:

General Tel: 08708 506 506 (Mon-Fri 8-6) Call charges

apply. Incident Hotline: 0800 807060 (24 hrs)

Floodline: 0345 988 1188

Email: enquiries@environment-agency.gov.uk

Thames Water

Emergency Tel: 0800 316 9800 (select option 1)

Website: www.thameswater.co.uk/help-and-advice/bursts-and-leaks/report-a-leak-orburst-pipe

