

Flood Investigation Report

Locations: Various locations across the Borough

Flood Event: September 2024

Date of Report: March 2026

Version: 1.0

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EXECUTIVE SUMMARY

This report has been produced in accordance with the duties placed upon Bedford Borough Council as a Lead Local Flood Authority, under Section 19 of the Flood and Water Management Act 2010 to investigate a flood event. The purpose of the flood investigation is to identify reported impacts and likely causes of flooding, develop informed actions to reduce the risk of flooding in affected locations and/or increase the preparedness of communities for future flood events.

On the 22nd of September 2024 a yellow warning for thunderstorms was issued by the Met Office. A slow-moving front brought rainfall to Central England, particularly affecting the headwaters of the Great Ouse from Northamptonshire to North Hertfordshire, encompassing North Buckinghamshire and South Bedfordshire. The front included embedded thunderstorms, causing intense and prolonged rainfall. Small watercourses were quickly overwhelmed, leading to surface water flooding, fluvial flooding, and main river flooding.

Such meteorological phenomena are not uncommon in Eastern England during this time of year. The warm air temperature enables the atmosphere to hold large quantities of water, and the intensity of the storm rapidly saturates the top layer of soil.

The Borough suffered from two main rainfall events. The first one occurred on the 22nd of September when 62 mm fell over the Borough, flooding properties internally and externally and causing widespread disruption across the Borough network including the flooding of the A421. The first Tactical Coordination Group was convened through the Bedfordshire Local Resilience Forum to help manage and coordinate the response with partners across Bedfordshire. Local authority (LA) Resilience and Highways Teams were deployed issuing aqua sacs to households requiring them, offering reassurance and assisting pumping water away where possible. The rainfall resulted in high river levels coming down the River Great Ouse causing further fluvial flooding to many properties. LA teams continued to deploy aqua sacs, link in with flood groups and offer advice and reassurance. Highways officers continued to assess and close roads and bridges impacted by the flooding.

The second rainfall event occurred on the 26th of September 2024 where another 34 - 56mm fell in the northern parts of the Borough, this time on a saturated catchment, causing rapid pluvial (surface water) flooding across many villages and communities. It also led to significant network disruption and continual flooding of the A421 as well as flooding and closure of the Paula Ratcliff Way A6, all the northern road bridges including Turvey along the A428 and many other road networks. Many schools closed as a result of staff and children being unable to travel and a small number of rural communities became completely cut off.

Due to the scale of the flooding the LA responded by bringing in a specialist volunteer Water Team to assist in their response. The LA also utilised valuable support from the community Flood Groups, assisting and supporting their communities through a challenging week.

The second rainfall event resulted in further increased river levels coming down the Ouse, resulting further property flooding, in some cases the same properties that flooded two days prior flooded again. It was only when river levels started to drop after this second phase could the LA begin its recovery phase and start the clear up and assessment of the impact that had happened.

During that week over 150mm of rain fell in the Borough. Bedfordshire recorded its wettest September on record. 52 properties flooded internally over this week, of these 32 properties suffered surface water flooding, the remaining 20 properties experienced fluvial flooding from the River Great Ouse.

Once the initial impact of the flooding had passed the LA moved into the recovery phase and with support from partners and other LA teams completed Impact Assessments of all locations that were affected by flooding. Highways and Street cleansing officers attended to roads and gullies affected by the flooding, prioritising those locations where properties had flooded first and assisted with collection of flood damaged furniture and used aqua sacs.

Flood events bring a huge amount of silt and debris down the catchment into residents' properties and gardens, also blocking ditches, gullies and culverts. The speed of recovery after each flood event is therefore paramount to ensure the LA and communities recover as quickly as possible to minimise future impacts and improve future resilience.

Since September the Resilience Team has been working closely with residents, flood groups and its partners to investigate the flooding and understand how and why the flooding occurred, considering options for future works as well as mitigation opportunities. In many cases flooding was a result of overwhelming existing drainage and river systems. The unprecedented rainfall in isolated areas meant the existing drainage systems, ditches and watercourses could not cope with such huge volumes entering the system.

The impact flood groups had on assisting and supporting residents was greatly appreciated, without them it's likely more properties would have been affected. During flooding events, especially when considering pluvial flooding, impact can take effect very quickly, sporadically and often experienced right across the LA area of responsibility. Demand on the LA increases as the breadth of the area impacted by the event spreads, challenges experienced on the road infrastructure often results in difficulties reaching rural communities in need of assistance. Therefore, creating further community flood groups and continuing to support those already in place, provides the LA a direct link into the heart of the most at risk areas. Flood groups provide eyes and ears on the ground, feeding in valuable information and data on flood impact and resources that may be required, directly back to key professionals. Communities are more aware of their own flood risk; they are aware of those pinch points and high-risk areas and have kit to help other residents, creating a more resilient community ready to respond to future events as and when they occur. There is a need to continue building and supporting these groups as more of these intense storm events occur.

The Resilience Team are also looking at catchment wide mitigation through Natural Flood Management, where water can be held and stored in the upper reaches of the catchment through wet woodlands and leaky dams and release it slowly downstream after high flows have passed.

Within urban areas more innovative thinking how flood risk can be managed is necessary as restrictions of an urban environment present a specific challenge. Capturing and storing water at each stage before it enters a confined drainage system will hugely reduce the impact on surface water flooding in high-risk areas.

Although flooding cannot be stopped completely, we can be aware of the risk we face, understand the risk and mitigate its effect as much as possible. From individual resilience measures on properties such as air brick covers and flood barriers to, community flood groups, nature-based solutions and rain gardens. By working collectively and collaboratively with partners, communities and residents a more climate resilient environment, that is needed to face future climate events can be delivered.

1. INTRODUCTION

1.1. Background to investigation

As the Lead Local Flood Authority (LLFA) Bedford Borough Council, under Section 19 of the Flood and Water Management Act has a duty to investigate a flood event when considered appropriate and to the extent it deems necessary. The LLFA will identify the relevant Risk Management Authorities (RMAs) and record any actions which have been taken or they are proposing to action in response to the flood event. When an investigation is carried out under section 19 of the Act, the LLFA will publish the results of the investigation and notify any relevant risk management authorities.

The purpose of the flood investigation is to identify the reported impacts and likely causes of flooding, develop informed actions to reduce the risk of flooding in affected locations and/or increase the preparedness of communities for future flood events.

The flooding reported across the Borough was from both fluvial (river) and pluvial (surface water) sources, affecting residential, commercial, community, and educational properties. Properties were affected internally and externally, including flooding to gardens, garages and outbuildings as well as a large amount of the Councils road network.

1.2. Risk Management Authority Responsibilities

Figure 1.0 shows RMAs responsible for managing the flood risk from different sources that the BBC investigation procedure applies to. Owners of land adjoining, above or with a watercourse running through it are termed 'riparian owners' and have responsibilities to maintain and allow the free flow of water through their land.

| Flood Sources | Environment Agency | Lead Local Flood Authority (LLFA) | Drainage Authority | Water Company | Highway Authority | National Highways |
|--|--------------------|-----------------------------------|--------------------|---------------|-------------------|-------------------|
| | | BBC | Bedford IDB | Anglian Water | BBC | |
| Main River | ✓ | | | | | |
| Surface Water | | ✓ | | | | |
| Surface Water (originating from the highway) | | | | | ✓ | |
| Surface Water (originating from trunk roads) | | | | | | ✓ |
| Sewer flooding | | | | ✓ | | |
| Ordinary Watercourses | | ✓ | ✓ | | | |
| Groundwater | | ✓ | | | | |
| Reservoirs | ✓ | | | | | |

Table 1 – RMA's Responsibilities

1.3. Layout of Report

A total of 19 investigations across 15 villages/towns have been undertaken to underpin this overall report. The investigations focus on where internal property flooding was reported through to the LA. Other areas are likely to have suffered external flooding; however, due to the volume and widespread reports of flooding, efforts have been focussed to those reporting internal flooding only.

This report provides an overview of the flooding experienced across the Borough, the findings of the flood investigations, and next steps necessary. The next steps have been combined into a table of recommendations and can be found in Appendix A. Detailed flood investigation reports have been produced for each affected area. These contain further information on the findings from the investigation and the specific actions. These can be found in Appendix B.

1.4. Information sources

Information was gratefully received to aid in the flood investigations from the following:

- Bedford Borough Council Highways
- Bedfordshire Fire and Rescue Service (BFRS)
- Bedfordshire Local Resilience Forum (BLRF)
- The Environment Agency (EA)
- Anglian Water
- Members of the Public

2. FLOOD EVENT

2.1. Impact of Flooding

On September 22nd 2024 a slow-moving weather front brought intense rainfall to parts of Northamptonshire, Buckinghamshire, Hertfordshire, and Bedfordshire. Falling on dry ground and recently harvested fields, watercourses were soon overwhelmed, and flooding occurred in many areas across the Great Ouse catchment.



The Borough suffered two main rainfall events. The first one occurred on the 22nd of September when 62 mm fell over the Borough flooding properties internally and externally and causing widespread disruption across the Borough network. Following the first rainfall event 14 properties flooded internally from pluvial flooding. Many more properties were flooded externally and transport infrastructure suffered significantly, with rail delays and road closures, most notably the A421 at Marston Mortain which was closed for almost three weeks.

The rainfall resulted in high river levels coming down the River Great Ouse on the 25th of September, resulting in Flood Warnings being issued by the Environment Agency and rising to a level where properties flooded. Following these high river levels the borough suffered further intense

rainfall on the 26th of September with a further 36mm being recorded in Thurleigh however local rain gauges in other villages recorded around 56mm. Thurleigh also recorded 10mm in one hour on the 26th demonstrating the intensity that impacted the Borough. A rain gauge in Flitwick recorded 12mm of rain over a 15-minute period with 120mm recorded in a 24hour period. The rate of rainfall was high enough that despite most of the month being dry, the final week made September 2024 the wettest on record.

A further 18 properties flooded internally as a result of pluvial flooding from this second event. Many other properties were affected by externally flooding across the Borough. It also led to severe network disruption and continual flooding of the A421 as well as flooding and closure of the Paula Ratcliff Way, A6, all the northern road bridges including Turvey along the A428 and many other road networks. Many schools closed as a result of staff and children unable to travel and a small number of rural communities become completely cut off.

The River Great Ouse experienced a second peak that exceeded the initial rise but remained below the highest levels recorded in 1998 and 2020. A total of 20 properties were affected by fluvial flooding, with several flooding twice during the week due to both peaks. In total, 52 properties reported internal flooding, 32 from pluvial sources and 20 from fluvial. These figures do not reflect repeated flooding at individual properties and therefore do not fully capture the scale of impact experienced by residents and businesses during the event.

The week had a significant impact on many residents. It was only after the river levels started to drop after this second phase could the LA and its residents turn to its recovery phase and start the clear up and assessment of the impact that had occurred. The LA sought support through a specialist volunteer Water Team to assist in their response, alongside volunteers through LA staff and partners across the LRF. The LA also utilised the resilience embedded into the communities through their Community Flood Groups who were invaluable in assisting and supporting their communities through an extremely difficult, challenging and prolonged week.

2.1.1. Road Flooding

The A421 at the Marston Junction flooded on the 22nd of September, and took more than two weeks to clear, with a further week required to repair cross asset defects such as a pavement that was defective due to being waterlogged and road restraint systems that failed push pull tests after sitting in saturated ground during the flood.

The flood was caused due to intense rainfall event, it the region of 300-350% higher than the rolling 30-year average for the area. The main cause was the rainfall event being so severe that the pumping station could not pump the water away quickly enough and the water built up above the electrical controls of the pumping station, irreparably damaging them. National Highway pumps discharge into a balancing pond, that then discharges into the land drainage network. During this period the land drainage network had also overtopped meaning that the balancing pond did not have a positive outfall contributing to the problem and the ability of National Highways pumps to discharge into the ponds.

The Following Borough Highway roads were also flooded and closed:

- A428 Turvey
- High Street, Great Barford
- Green Lane, Stewartby
- Harrold Bridge
- Oakley Bridge
- Felmersham Bridge
- Radwell Bridge
- High Street, Clapham
- Water Lane, Kempston
- Lovell Road,
- A6 Sharnbrook
- A6 Paula Radcliffe North Bound Closed
- A6 Paula Radcliffe South Bound Closed



Many other roads in the north of the Borough were completely impassible. Several schools shut on the 26th of September as a result of the rainfall the previous day and high river levels, making travel routes around the north of the Borough challenging.

2.2. Cause of Flooding

A series of low-pressure systems brought very unsettled weather during the last ten days of September 2024, with 150 to 200mm of rain falling in the wettest areas. Bedfordshire record its wettest September on record.

The rain-radar images (Figure 2.0) left on the 21st of September and right the 23rd September provide an indication of the intensity of rainfall experienced during this event.

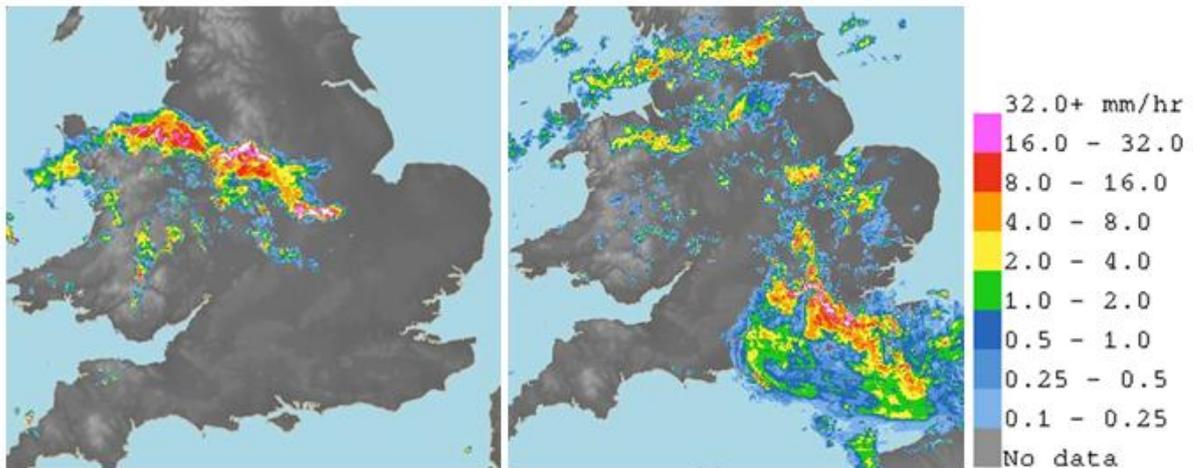


Figure 2.0 Rain-radar images 21st and 23rd September 2024.

The rain-radar images on the 26th September (figure 3.0) at 09:00 on the left and 16:30 on the right show the heavy rainfall associated with the next area of low pressure, with bands of torrential downpours spreading across much of central England and Wales.

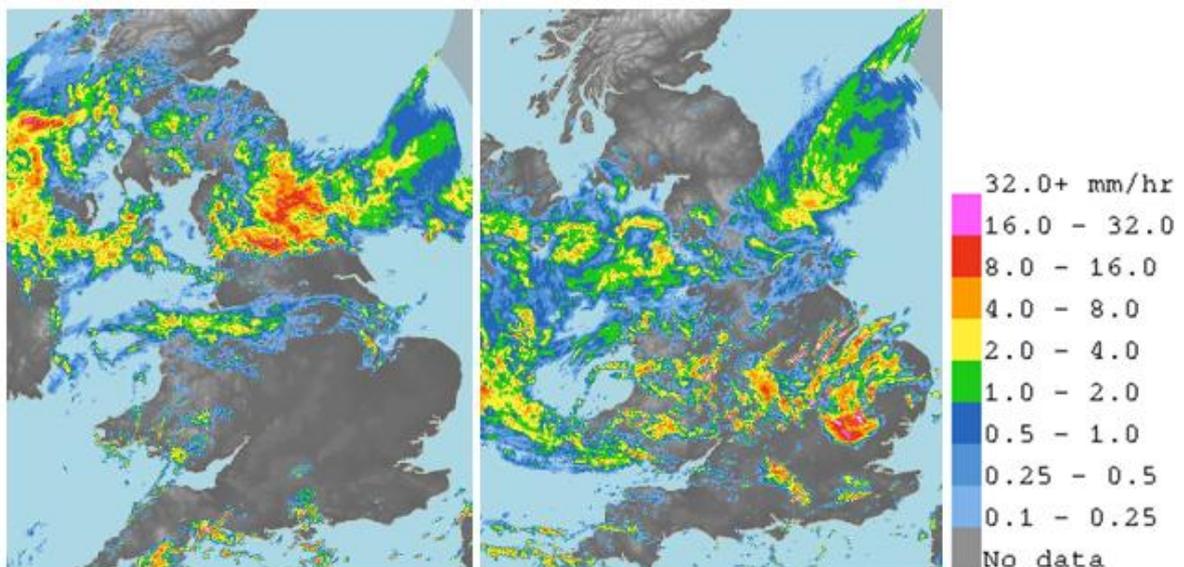


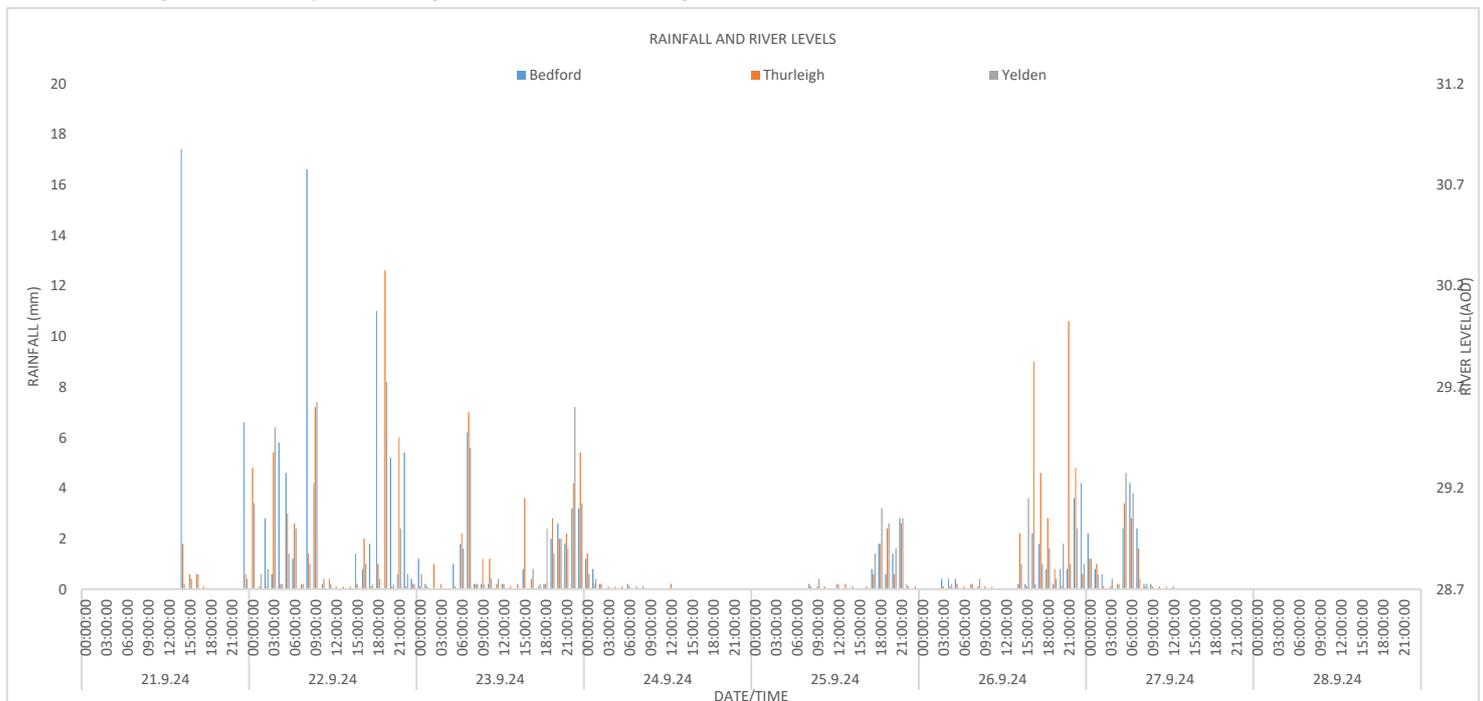
Figure 3.0 Rain-radar images 26.09.24

Figure 4.0 identifies the hourly rainfall amounts recorded during the week of 21st – 28th September 2024 at rain gauges in Bedford, Yelden and Thurleigh for comparison. It

was evident the intensity of rainfall varied significantly and was evident by the sporadic nature of property flooding due to pluvial flooding. On the 22nd of September 62.4 mm of rainfall was recorded on the Bedford gauge on top of 24mm the previous day. This unprecedented rainfall amount caused local drainage systems to quickly become overwhelmed, causing overland flows towards at risk properties.

The rainfall resulted in high river levels coming down the River Great Ouse on the 25th of September and rising to a level where properties flooded. Following these high river levels the borough suffered further intense rainfall on the 26th of September with a further 36mm being recorded in Thurleigh, however local rain gauges in other another village recorded around 56mm, to demonstrate the intensity of the rainfall events that hit the northern villages of the Borough. Thurleigh recorded 10mm in one hour on the 26th of September, leading to 150 mm during the week, 3 times the September average in just 7 days.

Figure 4.0 Hourly Rainfall figures across the Borough from 21st – 28th September 2024



The soil moisture deficit (SMD) ground saturation leading up to the week commencing the 21st of September was above normal for the time of year at 110mm, as shown on figure 5.0. However following the rainfall that week, the catchment soon became saturated, reading SMD levels at 7mm the week after the event. The huge peak in ground saturation can be evidenced in figure 6.0 with levels noticeably low for the time of year. The rainfall was high enough that despite most of the month prior being dry, the final week made September 2024 the wettest on record.

The geology beneath parts of the Borough is classified as Secondary and Undifferentiated aquifers, which means there is the potential for elevated groundwater. It is thought that elevated groundwater also contributed to the flooding experienced at some of the properties which reported water ingress into the basement.

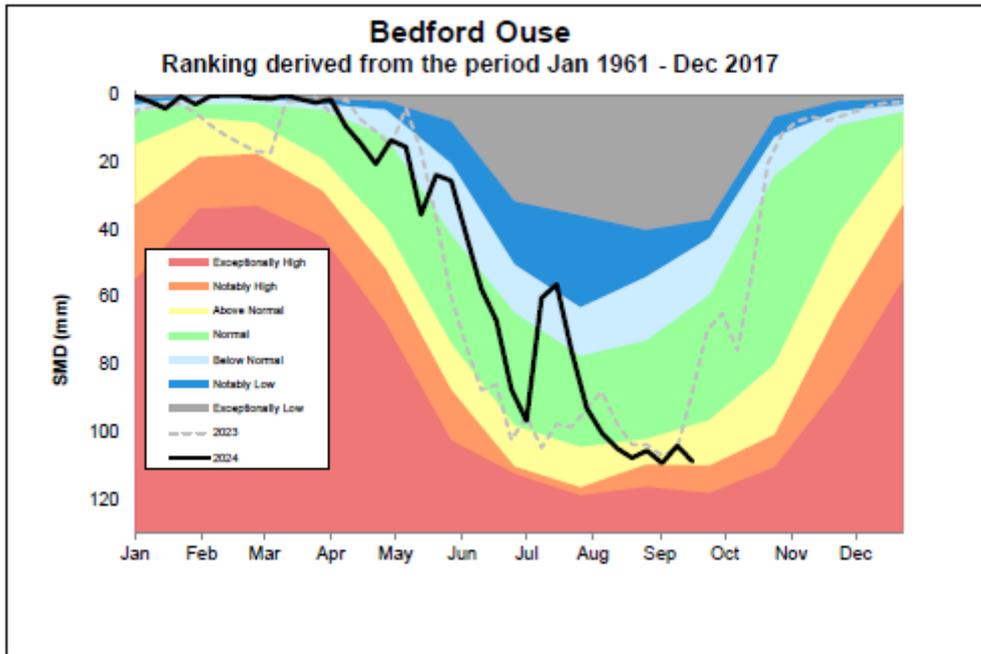


Figure 5.0 SMD levels from week ending 17th September 2024

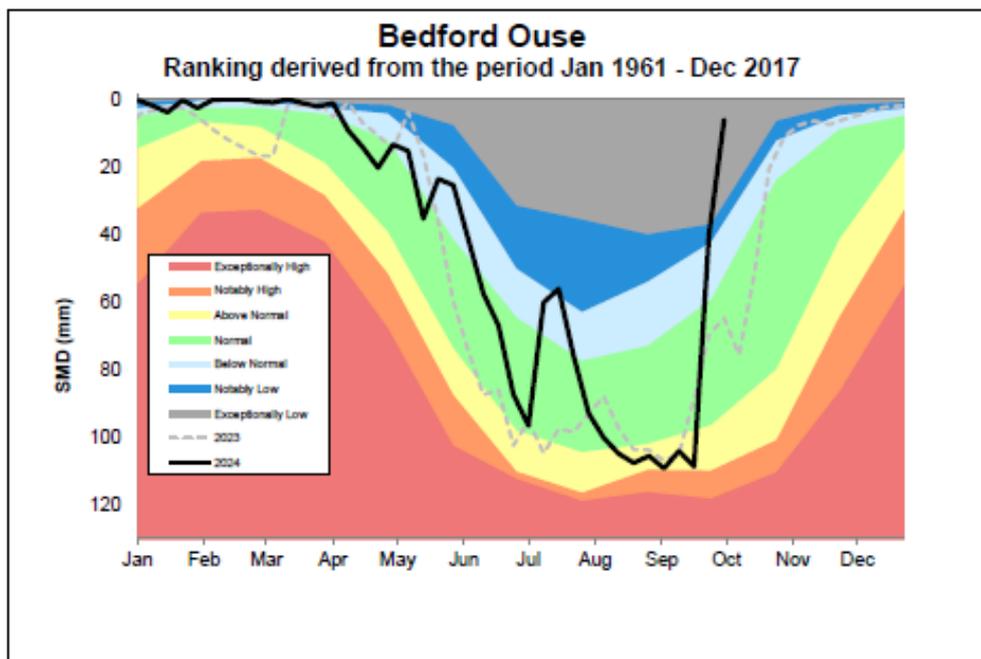


Figure 6.0 SMD levels from week ending 1st October 2024

The River Great Ouse reacted as a result of the rainfall across the catchment and led to high river levels coming down the Ouse. Two main peaks affected residential and commercial properties that are at risk of fluvial flooding. Figure 7.0 – 9.0 highlights the highest levels coming down the River Great Ouse at Turvey, Bromham and Bedford. Flood Alerts and Warnings were issued by the Environment Agency; however, levels did not exceed those highest ever recorded, apart from one location at Eaton Socon. This was predominately due to the river levels being below the normal range prior to

the first rainfall event. So ultimately had capacity to hold the huge rainfall amounts received during that week. At the Turvey gauge (Figure 7.0) levels rose above normal level on 23rd and continued to rise until the first peak passed through on the 25th of September reaching 45 AOD. Levels dropped slightly then rose again peaking 3 days later at a slightly higher level of 45.04 AOD. This pattern was mirrored downstream with the peak coming through Bromham and Bedford on the 26th of September. The second peak following around 3 days later again at slightly higher levels, but still below that from the December 2020 flood event.

Figure 7.0 River levels at Turvey from 21st – 28th September 2024

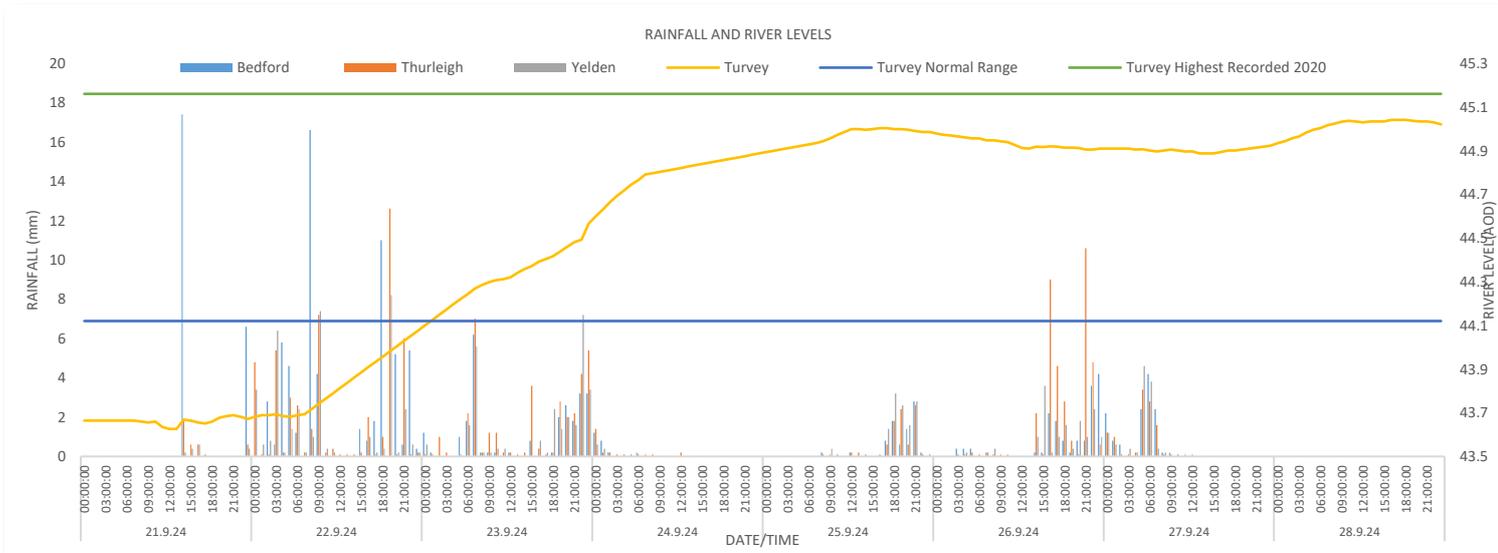
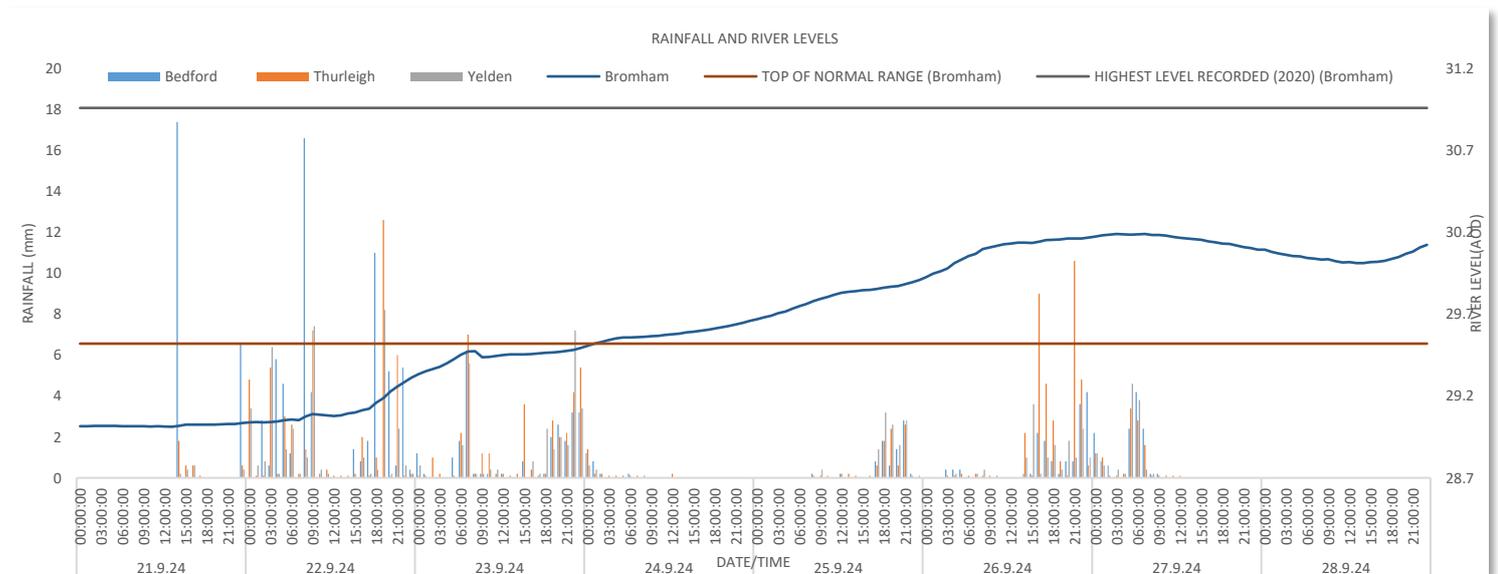


Figure 8.0 River levels at Bromham from 21st – 28th September 2024



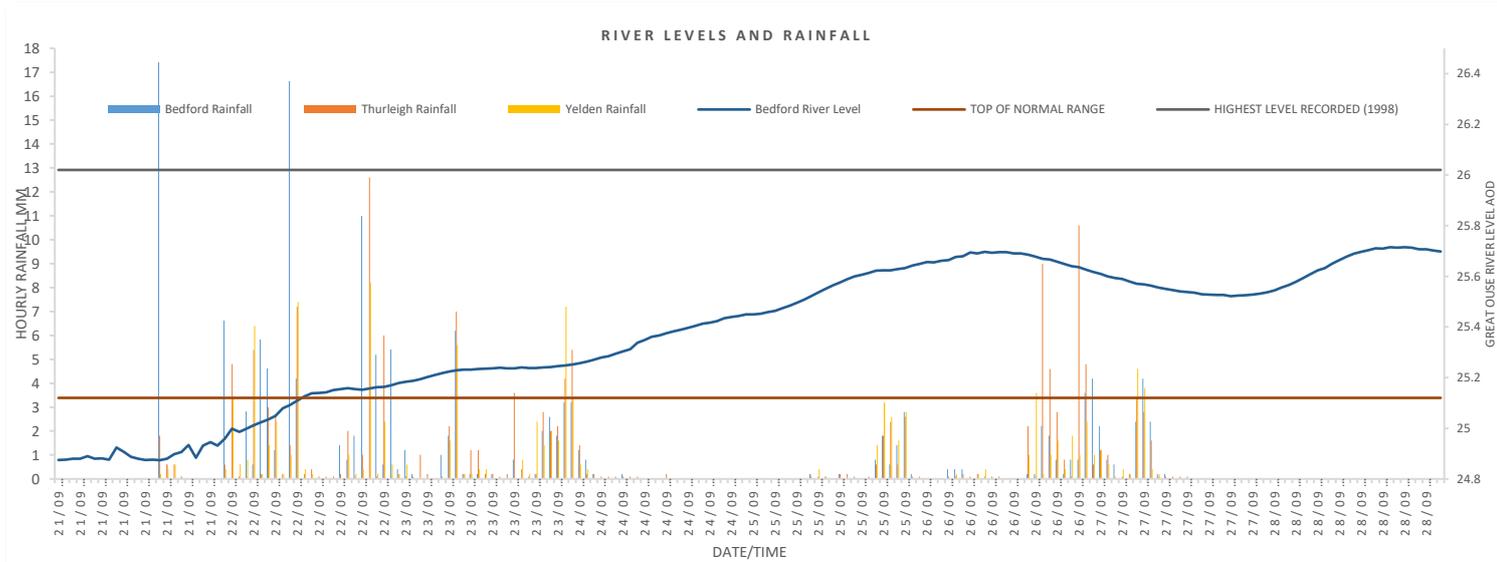


Figure 9.0 River levels at Bedford from 21st – 28th September 2024

2.2.1. Fluvial

Fluvial flooding (or river flooding) occurs when the water level in a Main River or Ordinary Watercourse rises and overflows onto the neighbouring land. The combination of saturated ground and heavy rainfall experienced across the Borough, contributed to water levels rising in Main Rivers and Ordinary Watercourses leading to the overtopping of their banks. It is considered that the heavy rainfall and saturated ground conditions were such, that the capacity of the watercourses would have been exceeded in the majority of locations regardless of the state of maintenance.

The reported flood mechanisms in many of the affected areas are consistent with the Environment Agency Flood Map for Planning, which identifies areas at risk of river flooding across the Borough.

The mapping shows that many of the affected properties are located within Flood Zones 2 and 3, which means the annual chance of river flooding is predicted to be between 0.1% and 1% (Flood Zone 2), or greater than 1% (Flood Zone 3).

The mapping is a useful visual tool to identify areas at risk of river flooding: [Rivers and sea map - Check your long term flood risk - GOV.UK](#). The Environment Agency is currently in the process of calculating the return period of the December 2020 floods, which will be a useful reference point to understand the magnitude of this event.

2.2.2. Surface Water

Surface water flooding occurs when natural and engineered systems lack capacity to manage the volume or intensity of rainfall. Surface water flooding can occur during high intensity rainfall events which overwhelm the local surface water drainage systems, or during lower intensity but longer duration events where saturated ground

conditions prevent infiltration. The flood water is then conveyed via overland flow routes dictated by the local topography and contributes to overwhelming the capacity of local drainage ditches and drainage features.

The affected areas are located in urban and rural locations. The rural locations are surrounded by farmland and fields. The combination of saturated ground and heavy rainfall formed overland flood flow routes within the nearby fields, following the local topography. In the urban areas drainage systems became quickly overwhelmed by the intensity of the rainfall causing overland flows to at risk properties often with low thresholds and or below road level.

The heavy rainfall and overland flow routes also overwhelmed the capacity of local highway drainage features, including culverts beneath roads, gullies, and sewers. Some drainage features were reported to be blocked, which contributed to the flooding. However, it is considered that the heavy rainfall and saturated ground conditions were such that the capacity of the ditches and local drainage features would have been exceeded regardless of the state of maintenance.

With high levels in Ordinary Watercourses and Main Rivers there was an impact whereby ditches and drainage systems were unable to discharge freely, which increased water levels upstream in the drainage networks and contributed to the flooding experienced.

The reported flood mechanisms in many of the affected areas are consistent with the Environment Agency Flood Risk from Surface Water mapping, which identifies the potential areas of ponding and flood flow routes that are expected to occur during rainfall events.

The mapping is a useful visual tool to identify areas at risk, although this is produced nationally so does not always correctly represent the local nuances in topography and drainage systems. This can be obtained through the following link: [Technical map - Check your long term flood risk - GOV.UK](#)

3. MET OFFICE WEATHER WARNINGS

The Met Office is responsible for issuing weather warnings, which warn of impacts caused by severe weather. The warnings are designed to let people, businesses, emergency responders and governments know what weather is in store and what the impacts of that weather may be.

The Met Office issues weather warnings, through the National Severe Weather Warning Service, when severe weather has the potential to bring impacts to the UK. These warnings are given a colour (yellow, amber or red) depending on a combination of both the impact the weather may have and the likelihood of those impacts occurring.

Yellow and Amber warnings represent a range of impact levels and likelihoods. This means it is important to read each warning to know what level of impact you can expect for your chosen warning area – and how likely those impacts are to occur.

These impacts can include damage to property, travel delays and cancellations, loss of water supplies, power cuts and, in the most severe cases, bring a danger to life.



- **Yellow Warning:** Yellow warnings can be issued for a range of weather situations. Many are issued when it is likely that the weather will cause some low-level impacts, including some disruption to travel in a few places.



- **Amber Warning:** There is an increased likelihood of impacts from severe weather, which could potentially disrupt your plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property.



- **Red Warning:** Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and others safe from the impact of the severe weather. It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread damage to property and infrastructure.

During the week commencing the 21st September the following Weather Warnings were issued:

21/09/24 - Met Office Yellow Weather Warning for Thunderstorms

21/09/24 - Met Office Yellow Weather Warning for Rain

22/09/24 - Met Office Amber Weather Warning for Rain

26/09/24 - Met Office Amber Weather Warning for Rain

4. FLOOD ALERTS AND WARNINGS

Many areas affected by fluvial flooding are located within Environment Agency Flood Warning and Alert areas. Environment Agency Flood Warnings/Alerts are issued by phone, email or text message to people who have signed up to get warnings if a flood event is predicted. [Get flood warnings by text, phone or email - GOV.UK](#)

There are three levels of flood warning:



- **Flood Alert** – A flood alert means that flooding is possible so you should prepare now.

The Environment Agency usually issues a flood alert between 2 and 12 hours before flooding. Flood alerts are usually issued during waking hours where possible.



- **Flood Warning** – A flood warning means that flooding is expected so you should act now.

The Environment Agency usually issues a flood warning 30 minutes to 2 hours before flooding.



- **Severe Flood Warning** – A severe flood warning means that flooding could cause danger to life and significant disruption to communities. You must act now.

The Environment Agency issues a severe flood warning when flooding threatens life and communities.

Below details the Flood Alerts and Warnings Issued within the Borough during the week commencing the 21st of September.

23/09/24 – Flood Alert River Great Ouse

23/09/24 – Flood Alert River Great Ouse Wyboston – Brampton

24/09/24 – Flood Warning area close to Eaton Socon

24/09/24 – Flood Warning wider area of Eaton Socon

24/09/24 – Flood Alert Rsieley Brook

24/09/24 – Flood Warning Odell

24/09/24 – Flood Warning Turvey

24/09/24 – Flood Warning no longer in force wider area of Eaton Socon

25/09/24 – Flood Warning Harrold

26/09/24 – Flood Warning Beford

26/09/24 – Flood Alert no longer in force Risley Brook

26/09/24 – Flood Warning no longer in force Bedford

26/09/24 – Flood Alert Risley Brook

27/09/24 – Flood Warning Updated for Bedford

27/09/24 – Flood Warning Updated for Harrold

27/09/24 – Flood Warning Updated for Turvey

27/09/24 – Flood Warning Updated for Odell

27/09/24 – Flood Warning Updated area close to Eaton Socon

27/09/24 – Flood Alert Updated Risley Brook

28/09/24 – Flood Alert River Updated Great Ouse Wyboston – Brampton

28/09/24 – Flood Alert Updated River Great Ouse

28/09/24 – Flood Alert No longer in force River Kym

The last Flood Alert came off on the 11th of October before being issued again on the 23rd of November.

A total of 7 Flood Alerts and 11 Flood Warnings were issued during this week.

5. RISK MANAGEMENT AUTHORITY RESPONSE

Due to the scale of the event across the catchment a coordinated multi-agency response was essential with partners across the Local Resilience Forum (LRF). The first reports from Bedford Borough residents of internal property flooding were received on Sunday the 22nd of September 2024. Upon receipt of these concerns Highways Teams alongside the Resilience Team were deployed to issue aqua sacs and offer support, advise and reassurance. The first BLRF Tactical Coordination Group (TCG) was convened that evening following multiple reports of property flooding across Bedfordshire. The TCG meetings continued daily throughout the week to ensure a shared situational awareness and a coordinated response between relevant responding agencies was achieved. A Strategic Coordination Group (SCG), consisting of senior leaders from all responding organisations, was convened on Tuesday the 24th of September due to the widespread flooding of properties and significant strain on resources and continued daily that week.

Throughout the week the LA received nearly 250 calls, 120 relating to property flooding, internal and external. The Council requested the assistance of from volunteer responders from REACT Disaster response during the week. REACT are a humanitarian response volunteer charity with a water specialist volunteer team who assisted the Council in accessing people cut off by flood water, issuing aqua sacs to residents and accessing villages cut off by flooded roads.

Alongside REACT the Resilience Team utilised the support of the community flood groups who were instrumental in ensuring their communities were as resilient as possible when facing such conditions.

The Resilience and Highways Teams visited residents reporting flooding or concerned by rising water levels and deployed aqua sacs to those properties at imminent risk of flooding. Highways officers cleared gullies and pumped water away where appropriate and continued to close roads and bridges impacted by flooding. The LA aqua sac supply was prioritised ensuring the supply lasted the duration of the incident.

The week had a big impact on many residents. It was only after the river levels started to drop after this second phase could the LA and also residents begin a recovery phase and start the clear up and assessment of the impact of the event.

The EA contributed by participating in the BLRF strategic and tactical coordination groups, deploying over 200 staff, issuing flood alerts and warnings, and providing media briefings. The EA also deployed drones to real-time flood area visuals to help inform decision making. Between September and November, approximately 1000 properties across the catchment were affected by flooding, nearly half of them internally.

5.1. Emergency Assistance Centres

Bedford Borough Council did not stand-up emergency assistance centres in this period. This decision was based on there being no identified need, due to no large-scale evacuations of residential properties following flooding. All residents that reported internal property flooding to the Council either remained in their property or made their own arrangements for alternative accommodation.

5.2. Major Incident

No Major Incident declaration was made during this period.

5.3. Recovery

Once the incident response was stood down the Resilience team called upon staff volunteers from Bedford Borough Council, along with staff from Bedfordshire Fire and Rescue Service and Bedfordshire Police, to visit all properties that had reported flooding. Property visits were conducted to carry out impact assessments of flooded properties to check on welfare, provide emotional support, assess damage, arrange collection of damaged furniture/carpets/and used aqua sacs, and assess the damage impact the flooding had caused. The information provided led to follow up investigations and works being raised for future mitigation/support and resilience.

The LA Street Cleansing team were deployed to collect any used and unwanted aqua sacs along with damaged furniture and carpets from properties. Impact assessments were also completed on the LA roads and other infrastructure to ensure Street Cleansing and Highways could attend those areas most affected. In many of the communities the Flood Groups also supported the LA through its recovery phase, visiting flooded properties and coordinating the collection of aqua sacs and furniture. The LA were also able to redistribute kit to the flood groups to ensure they were topped up for future events.

Recovery meetings were held at a LRF level from the 30th – 4th October 2024. These meetings ensured that all agency recovery priorities were aligned and the process was as efficient as possible.

A debrief report was written by the LA resilience team, with input from all LA staff involved in the response and recovery. The LA Resilience team took part in a multi-agency debrief of the response on the 6th of February 2025.

6. NEXT STEPS/RECOMMENDATIONS

Following the extended flood event and impact many residents of the Borough faced, the Resilience Team has investigated the flood event and produced a series of recommendations and steps that the LA and its partners can take to mitigate and manage future flood events. Each area investigated has their own individual recommendations summarised in Appendix A. There is a total of 74 recommendations across the 19 Individual investigations.

Following the flooding, investigations and inspections were carried out to ensure the LA returned to normal. Street cleansing cleared the debris from flooded roads and flood damaged goods from affected properties. Highways brought in an additional gully motor to attend to all those located that were affected by flooding or roads that have been flooded.

Both the Resilience and Highways Team carried out further investigations and CCTV surveys to further understand the flooding mechanism. This extended to partnership work with the EA and Anglian Water ensuring their assets and systems were clean and fully operational.



The Resilience Team has proactively engaged with affected communities since the flood incident, building on previous good practice of developing further Community Flood Groups. by working with communities and Parish Councils. The existing groups held their own debriefs and updated their flood plans following lessons learned during the flood event. Flood Kits have been checked and additional kit issued where required. Through working alongside these groups the LA identified the need for additional kit to be offered and have been successful in a Rural Prosperity Grant where additional kit to support flood events and aid recovery with items such as water vacuums and dehumidifiers.

There are now 11 Flood Groups across the Borough and more potential groups currently being developed. Through the listed recommendations the Resilience Team will look to investigate the appetite for further groups in additional communities affected by the flooding. Some Flood Groups are now taking a positive and more proactive approach to flooding within their communities, by working alongside the Resilience Team to look at areas where Natural Flood Management (NFM) can be implemented. This approach to flood risk management takes a catchment approach and looks to slow down and hold back water along the catchment to reduce the impact where properties exist. NFM creates a multitude of benefits, not only for flood

risk management but through increased biodiversity, water quality and improvements in local amenity.

Within urban areas more innovative thinking is necessary with regard to how flood risk is managed, capturing and storing water at each stage before it enters a confined drainage system will hugely reduce the impact on surface water flooding in high risk areas. This could be achieved by measures such as residential or commercial water butts, SuDs planters and raingardens. For example, one water butt holding 200Litres may not seem significant but even over a small scale of 100 houses installing such a system would result in 20,000 Litres of rainfall being stored.

Some of the recommendations may require bids for funding from external sources and collaborative working between partner organisations. Due to the number and complexity of the actions, these will be prioritised reflecting the resources available and known flood risk.

The Resilience Team will continue to track progress and update the actions as appropriate. These recommendations can be found in Appendix 1.

7. APPENDICES

- A.** Summary of the recommendations resulting Individual Flood Investigations
- B.** Individual Investigations 1 - 19

APPENDIX A. Summary of Recommendations as a result of the Flood Investigation reports

The table below provides an overview of all recommendations concluded in the individual flood investigation reports over the 19 different areas.

| | Area | Timescale | Recommendation | Responsible Party |
|----|-----------------------------|--|--|------------------------------------|
| 1 | Exeter Walk, Bedford | Complete | Ensure gullies in vicinity are clear and working. | BBC Highways |
| 2 | | Complete | Ensure Surface Water main and is clear and working. | Anglian Water |
| 3 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner/Housing Association/LLFA |
| 4 | | Medium Term (6 – 12 months) | Investigate the appetite to setup a community Flood Group in this location/area. | LLFA |
| 5 | The Avenue, Bletsoe | Complete | Ensure gullies in vicinity are clear and working. | BBC Highways |
| 6 | | Complete | Ensure Surface Water main and is clear and working. | BBC Highways |
| 7 | | Complete | Complete a full camera survey of the drainage in the vicinity to ensure no defects. | BBC Highways/Homeowner |
| 8 | | Complete | Carry out necessary repair works to drainage system. | Homeowner |
| 9 | Cardington Road, Bedford | Inspections short term (1-6 months) Remedial works as required | Inspect main river assets (sluices, weirs, gates, locks and riverbanks) and identify the requirement for remedial works. | Environment Agency |
| 10 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 11 | Pavenham Road, Carlton | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 12 | | Complete | Ensure all ditches and watercourses re inspected and clear and flowing well. | Riparian Owners / LLFA. |

| | | | | |
|----|----------------------|-----------------------------|--|--------------------|
| 13 | | Ongoing | Continued engagement with and support of the community Flood Group to enable preparedness in advance of a future flood. | LLFA |
| 14 | | Complete | Explore what additional flood kit can be provided to the community flood group to support and increase their reliance within the community. | LLFA |
| 15 | | Complete | Investigate the outfall to the main surface water ditches from Carlton to ensure the ditch is clear and free from vegetation and debris. | LLFA |
| 16 | | Medium Term (6 – 12 months) | Re-visit the benefits of installing an additional culvert on Pavenham Road, Carlton to reduce the flood risk from overland flows from Pavenham Road. | LLFA |
| 17 | | Medium Term (6 – 12 months) | Explore the feasibility of NFM measures in the catchment around Pavenham Road to help manage the flood risk in the vicinity. | LLFA/ Landowner |
| 18 | Odell Road, Harrold | Complete | Ensure gullies in vicinity are clear and working. | BBC Highways |
| 19 | | Complete | Write to riparian owner of ditch to ensure ditch is dug out. | LLFA |
| 20 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 21 | High Street, Clapham | Complete | Investigate the need for improvements to the Flood Warning system. No actions were identified for this warning area. | Environment Agency |
| 22 | | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 23 | | Complete | Investigate the drainage systems and ditches upstream to ensure they system is working effectively and efficiently to ensue surface water upstream outfalls at its correct location and not down the High Street | BBC Highways/LLFA |
| 24 | | Ongoing | Continue support with the Flood Group to ensure debriefs/training and flood kit are topped up. | LLFA |
| 25 | | Medium Term (6 – 12 months) | Investigate the feasibility of NFM measures/ SuDs measures in the catchment to reduce the surface water impact. | LLFA |
| 26 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 27 | | Complete | Ensure gullies and culverts in the vicinity are clear and working. | BBC Highways |

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|----|-------------------------------|-----------------------------|--|------------------------------|
| 28 | The Green, Harrod | Complete | Inspect Main River Assets and (sluices, weirs, gates, locks and riverbanks) and identify the requirement for remedial works. | Environment Agency |
| 29 | | Ongoing | Continue support with the Flood Group to ensure debriefs/training and flood kit are topped up. | LLFA |
| 30 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner/Environment Agency |
| 31 | Kempston, West | Complete | Ensure gullies and culverts in the vicinity are clear and working. | BBC Highways |
| 32 | | Complete | Inspect Main River Assets and (sluices, weirs, gates, locks and riverbanks) and identify the requirement for remedial works. | Environment Agency |
| 33 | | Complete | Set up a community Flood Group and support with training, debriefs after flood event and provide flood kit. | LLFA |
| 34 | | Ongoing | Continue development of the NFM Kempston Project on the Wood End Brook catchment | LLFA |
| 35 | | Ongoing | Investigate the feasibility of PLR measures in at risk properties. | Environment Agency |
| 36 | Marina Court, Kempston | Complete | Inspect Main River Assets and (sluices, weirs, gates, locks and riverbanks) and identify the requirement for remedial works. | Environment Agency |
| 37 | | Ongoing | Continue development of community Flood Group and support with training, debriefs after flood event and provide flood kit. | LLFA |
| 38 | | Ongoing | Investigate the feasibility of PLR measures in at risk properties. | Environment Agency |
| 39 | Oakley | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 40 | | Medium Term (6 – 12 months) | Explore the appetite to establish a Community Flood Group in the area. | LLFA |
| 41 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 42 | Odell | Complete | Ensure gullies in vicinity are clear and working. | BBC Highways |
| 43 | | Medium Term (6 – 12 months) | Investigate upstream catchment for future mitigation options | LLFA |

| | | | | |
|----|--------------------------|-----------------------------|--|-------------------------|
| 44 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner/LLFA/EA |
| 45 | Pavenham | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 46 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 47 | | Medium Term (6 – 12 months) | Investigate upstream catchment for future mitigation options | LLFA |
| 48 | | Medium Term (6 – 12 months) | Explore the appetite to establish a Community Flood Group in the area. | LLFA |
| 49 | Moor End, Radwell | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 50 | | Medium Term (6 – 12 months) | Explore the appetite to establish a Community Flood Group in the area. | LLFA |
| 51 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 52 | Stagsden | Complete | Ensure underside of Wick End bridge over the brook is clear of debris | BBC Highways/Structures |
| 53 | | Complete | Riparian owner given advice to clear the brook of trees and debris | Homeowner |
| 54 | Stevington | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 55 | | Complete | Ensure AW foul is clear and working. | Anglian Water |
| 56 | | Ongoing | Continue support with the Flood Group to ensure debriefs/training and flood kit are topped up. | LLFA/SFG |
| 57 | | Medium Term (6 – 12 months) | Investigate the culvert at West End Church Walk and Court Lane and explore mitigation options to reduce the impact in this location. | LLFA/Highways/SFG |
| 58 | | Medium Term (6 – 12 months) | Investigate the feasibility of NFM within the catchment to reduce the overall surface water flood risk to the community. | LLFA/SFG/Landowners |
| 59 | Thurleigh | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |

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|----|------------------------|-----------------------------|--|-----------------------------------|
| 60 | | Medium Term (6 – 12 months) | Complete a drainage and CCTV survey in the vicinity to investigate the condition of the Highway Drainage. | BBC Highways |
| 61 | | Medium Term (6 – 12 months) | Explore the appetite to establish a Community Flood Group in the area. | LLFA |
| 62 | | Medium Term (6 – 12 months) | Investigate the drainage of the upstream catchment. | LLFA |
| 63 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties and or additional drainage. | Homeowner |
| 64 | Turvey | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 65 | | Complete | Ensure Surface Water main is clear and working. | Anglian Water |
| 66 | | Ongoing | Continue support with the Flood Group to ensure debriefs/training and flood kit are topped up. | LLFA |
| 67 | | Medium Term (6 – 12 months) | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 68 | Potters Cross, Wootton | Complete | Ensure gullies and culverts in vicinity are clear and working. | BBC Highways |
| 69 | | Complete | Ensure all outfalls into the brook are clear and free flowing | BBC Highways |
| 70 | | Complete | Ensure the gullies on the bridal way of Potters Cross are placed onto the cyclical gully cleansing cycle | BBC Highway |
| 71 | | Complete | Ensure any required maintenance is carried out on the brook | IDB |
| 72 | | Complete | Investigate the feasibility of PLR measures in at risk properties. | Homeowner |
| 73 | Wyboston | Complete | Inspect Main River Assets and (sluices, weirs, gates, locks and riverbanks) and identify the requirement for remedial works. | Environment Agency |
| 74 | | Ongoing | Investigate the feasibility of PLR measures in at risk properties. | Property Owner/Environment Agency |