

Flood Report

Blackmile Lane, Grendon, Northamptonshire

October 2024

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| Location: | Lower End, Grendon, Northamptonshire. NN7 1JR |
| Date of flooding: | Sunday 22 to Tuesday 24 September 2024 Friday 27 September 2024 |
| Extent of Flooding: | <p>12 properties at the bottom of Lower End (the junction of Blackmile Lane and Main Road) suffered internal flooding to the lower/ground floors. 4 properties lost all electrical power for 2 days.</p> <p>Main Road between Grendon Brook and the property known as “The Ark” was flooded to a depth of over 40inches and remained impassable for over 48 hours.</p> <p>Residents above the flood zone were stranded for 48hours as there were no other usable access routes.</p> <p>Heavy rain on the night of Thursday 26 and Friday 27 September led to the area flooding again for 24 hours.</p> |

The aim of this report is to identify the circumstances and perceived causes of the flooding and so prevent future flood incidents. The purpose of the report is not to determine liability nor apportion blame, except so far as is necessary to achieve its aim.

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Report Summary

On the night of Sunday 22 September 2024, exceptionally heavy rain fell on an already saturated catchment of the Grendon Brook. The increased water levels in the Grendon Brook were likely held back by multiple obstructions along its course forcing it to build up before overtopping low points in the northern bank.

As evidenced by stubble wrack lines in the fields, this flood water ran parallel to the Grendon Brook following the natural low-lying geography across several fields before reaching the area known as Lower End (comprising the houses on Main Road and up Blackmile Lane). At this point, the accumulated flood water burst onto Main Road which acted as a channel toward the Lane and simultaneously into the rear of the properties in Lower End.

A total of 12 properties sustained internal flooding with some losing power supplies for the next 24 hours. Residents further up Blackmile Lane who were not directly flooded had no means of exiting or accessing Lower End as there were no alternative routes.

Subsequent inspection of the Grendon Brook, the adjacent fields and along the channel known as Gibbards Arm (flowing north from Lower End to the River Nene via Summer Leys) points to a combination of four factors potentially causing this flood incident:

- 1) Exceptionally heavy rainfall over a short period of time (three times the monthly average rainfall in 24 hours or 150mm) on an already saturated catchment and collected in the Grendon Brook;
- 2) Multiple obstructions along the banks and the bed of Grendon Brook restricting water flow and causing it be held up and to pool near Lower End;
- 3) The uneven height of the northern bank of Grendon Brook was exploited by the pooling water allowing it to overtop the banks of Grendon Brook;
- 4) Drainage on the route taken by the flood water across the fields, along Main Road and onto Blackmile Lane was compromised by:
 - a. lack of capacity;
 - b. lack of maintenance and repair, and;
 - c. numerous obstructions (garden waste, cut tree branches and structures).

Location, water courses and flood risk

Location

The area known as Lower End in Grendon is centred around the junction of Main Road and Blackmile Lane. It lies approximately 500m to the north of the Grendon village boundary.

Topographically it lies between the hill on which the village is located to the south and a smaller hill to the northeast.

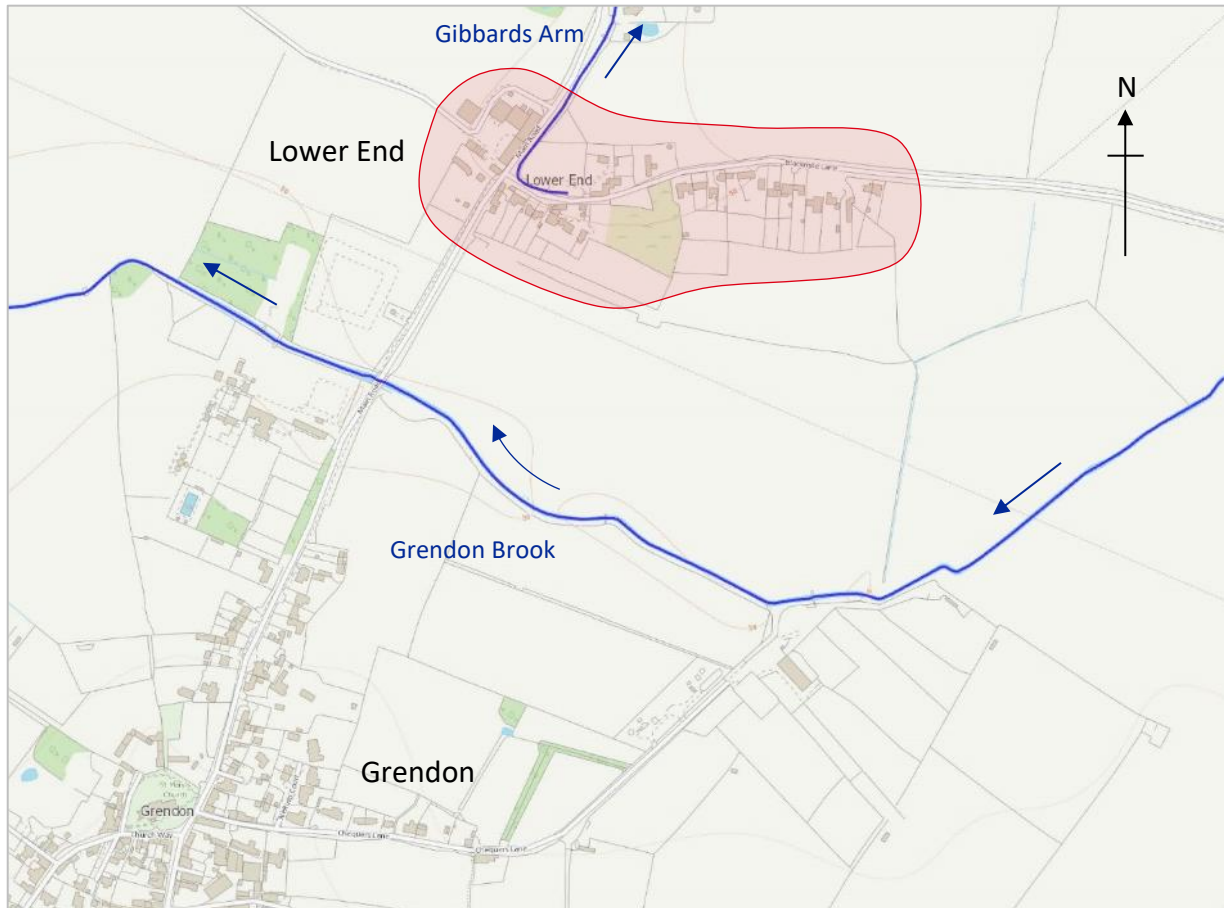


Figure 1: Location and watercourses © C. Dow

Water courses

Grendon Brook flows west before turning north to join the River Nene at Summerleys.

An additional watercourse known as Gibbards Arm surfaces at the junction of Blackmile Lane and Main Road and flows north before it joins the Grendon Brook at Summer Leys.

There is also a system of highways and field drainage systems in the area which feed into these two watercourses.

Grendon Brook

Grendon Brook is a main river¹ rather than an ordinary watercourse and as such is maintained by the Environment Agency. It has been given an asset label of 444481. According to publicly available records on the Defra Asset Management website², it is 934.05m long and has the primary purpose of providing fluvial (river) flood risk management. It is bordered on either side by natural high ground providing a deep channel.

It is unclear from the public records what maintenance work has recently been carried out by the Environment Agency. The website's last maintenance history record is for November 2018 and refers to Aquatic Vegetation Management (m) with the activity purpose to "maintain conveyance".

According to residents, the most recent work carried out on the Brook was few weeks prior to the flood incident. This involved a contractor using a special digger with a weed cutting attachment to remove weeds and other vegetation from the channel.

Gibbards Arm

Gibbards Arm, whilst smaller than Grendon Brook, is also categorised as a main river and is maintained by the Environment Agency. It starts as a culvert carrying roadside drainage water from Blackmile Lane and Main Road before entering an open channel (with a number of culverts under driveways and field edges). According to the Defra Asset Management website some of these culverts, such as culvert 565887 for example, are maintained by the Local Authority. The website shows no maintenance records.

It is unclear from the Defra Asset Management website what maintenance work has recently been carried out by the Environment Agency to Gibbards Arm. The last maintenance history record is for July 2019 and refers to "Vegetation Management Additional (m)" with the activity purpose to "maintain conveyance".

Riparian ownership

Both watercourses run in open channels across private land which raises the question of riparian ownership responsibilities.

According to the Flood Hub website (<https://thefloodhub.co.uk> retrieved 01 October 2024) "A riparian owner is somebody who has either a main river or an ordinary watercourse, such as a stream or culvert, running through, beneath or adjacent to the boundary of their land. If the watercourse forms the boundary of the land, you will usually own it up to its centre. "

¹ Definition: <https://www.gov.uk/government/publications/designation-of-main-rivers-guidance-to-the-environment-agency/designation-of-main-rivers-guidance-to-the-environment-agency>. Retrieved 01 October 2024. "Main rivers are usually larger rivers and streams. They are designated as such and shown on the Main River Map. The Environment Agency carries out maintenance, improvement or construction work on main rivers to manage flood risk. Other rivers are called 'ordinary watercourses'. Lead local flood authorities, district councils and internal drainage boards carry out flood risk management work on ordinary watercourses."

² <https://environment.data.gov.uk/asset-management/index.html?element=http%3A%2F%2Fenvironment.data.gov.uk%2Fasset-management%2Fid%2Fasset%2F444481&layer=all-assets.gov.uk> retrieved 01 October 2024

The Environment Agency outlines the responsibilities of a riparian owner in a publication titled “Living on the Edge – A guide to your rights and responsibilities of riverside ownership” which is available online from the Water Management Alliance³. The Environment Agency also provides more detailed guidance online via the Gov.uk website (“Guidance – Owning a watercourse”⁴).

In summary though, a riparian owners responsibilities can be summarised as:

- Report an incident (flooding, blockages, pollution, unusual flow changes collapsed banks etc)
- Let water flow naturally (removal of blockages, fallen trees or overhanging branches)
- Prevent pollution (removal of litter and animal carcasses, no dumping of garden waste or vegetation)
- Protection of wildlife (not disturbing wildlife fish or birds and their nests)
- Apply for a permit or FRAP (Flood Risk Activity Permit) to carry out work within 8m of a watercourse

Flood Risk

The Flood risk map below highlights the topographical features and the low-lying nature of Lower End. The September 2024 incident is unusual in that properties outside of the flood zones shown above suffered internal flooding which raises questions about the source and direction of travel of the floodwater.



Figure 2: Flood risk map of Lower End including Blackmile Lane (© Environment Agency)

³ https://www.wlma.org.uk/uploads/EA_Guide_to_rights_and_responsibilities_of_riverside_ownership.pdf retrieved 01 October 2024

⁴ <https://www.gov.uk/guidance/owning-a-watercourse> retrieved 01 October 2024

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It will be noted that the properties affected by flooding in September 2024 all lie within the area shown as being in flood zone 3. This is described by the Environment Agency and planning authorities as having “a high probability of flooding from rivers and the sea.”.

Whilst the flood zone mapping ignores the effect any flood defences might have, it should be noted there are no flood defences between Grendon Brook and Lower End or between Gibbards Arm and Lower End.

Rainfall

The UK Meteorological Office has confirmed (30 September 2024) that this was the wettest September on record since 1876 with three times the monthly average rainfall – approximately 150mm – falling in 24hours. As a result, there have been many properties flooded across the county (both river and surface water flooding).

At this point it is unknown exactly how much rain fell on Lower End on the night of Sunday 22 through to Tuesday 24 September 2024, however it was consistent and heavy. There had been constant rain over the weekend including thunderstorms. The effects of this rainfall were seen in neighbouring villages, for example, Easton Maudit (1.5mi south-east of Lower End) saw extensive property damage due to surface water flooding caused by run-off from the surrounding land.

Locally, the geographical features around Lower End caused rainwater to be focused on the Grendon Brook which was then carried into Gibbards Arm by highways drainage, field ditches and along Main Road itself.

Effects of flood incident

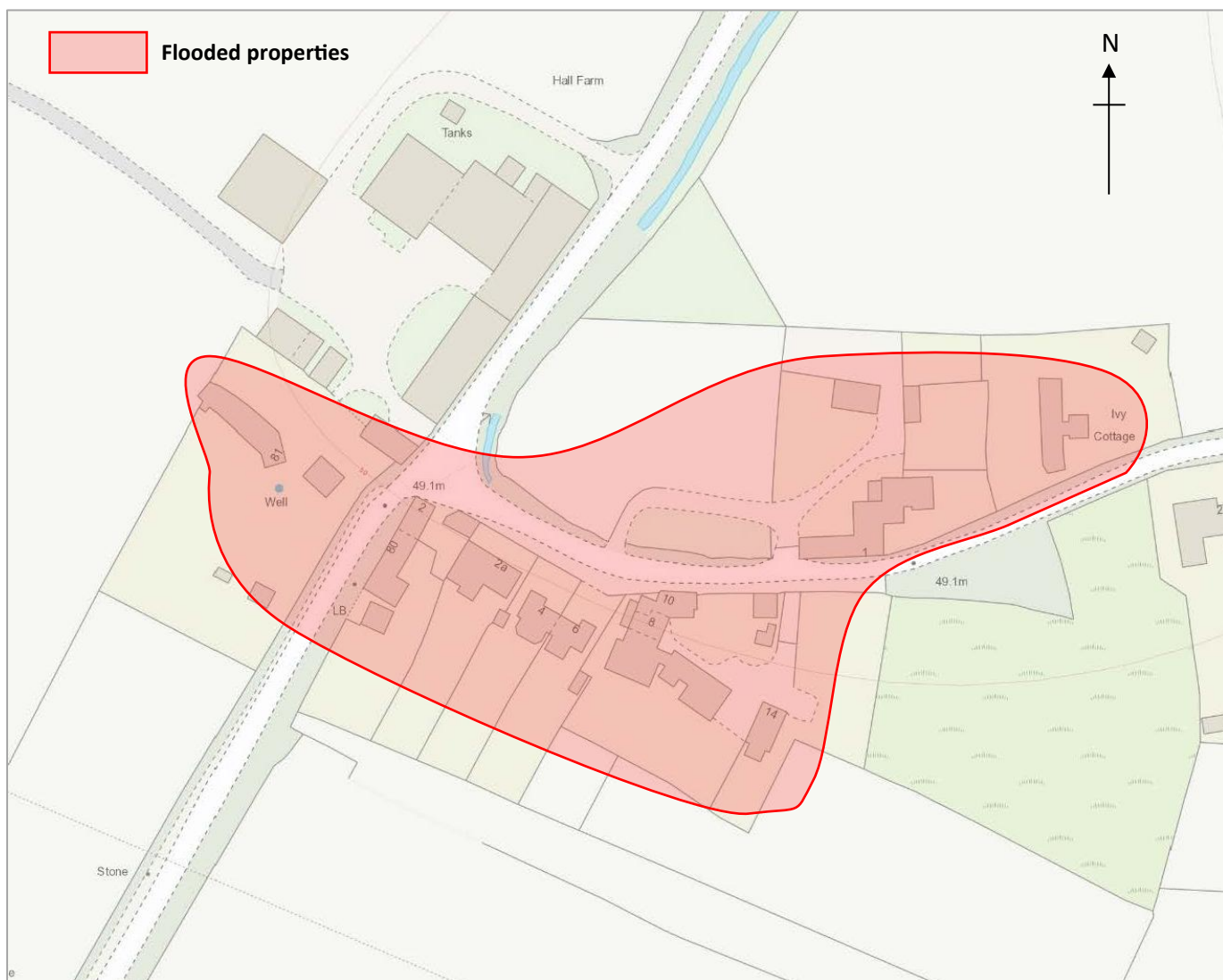


Figure 3: Map showing extent of internally flooded properties © C. Dow

Figure 3 (Location of internally flooded properties) shows the extent of properties within Lower End (Blackmile Lane and Main Road) which suffered internal property flooding. 11 homes reported flood water reaching varying heights on their ground floors.

| Domestic properties affected by internal flooding: | | |
|--|--------------------------------|-------------------------------------|
| 80 Main Road | 2a Blackmile Lane | 8 Blackmile Lane |
| 81 Main Road | 3 Blackmile Lane (Ivy Cottage) | 10 Blackmile Lane (Trinity Cottage) |
| 1 Blackmile Lane (Old Farmhouse) | 4 Blackmile Lane | 14 Blackmile Lane |
| 2 Blackmile Lane | 6 Blackmile Lane | The Ark (on Main Road) |

Table 1: Properties experiencing internal flooding / floodwater damage

A major issue for the residents of flooded properties was the bow wave of passing vehicles causing contaminated floodwater to flow back into their properties even as they were attempting to remove it. This was caused by Main Road not being officially closed to vehicular traffic until Tuesday 24 September, 48 hours after the flooding started. The official road closure was short lived and vehicles were soon transiting

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the flooded section of Main Road to the detriment and frustration of flooded residents. Unofficial attempts to close Main Road and prevent further flooding of properties by vehicle bow waves were at best ignored by drivers.



Figure 4: Vehicles able to risk Main Road as no road closure by the authorities. NOTE bow wave from vehicle washing into stranded car and homes. © C. Dow



Figure 5: Vehicles able to risk Main Road as no road closure by the authorities. NOTE bow wave from vehicle washing into stranded car and homes. © C. Dow

Those residents of Blackmile Lane with properties unaffected by floodwater were effectively stranded for 3 days (Monday, Tuesday and Friday) as the only vehicular exit from the lane was underwater. On a wider scale, Grendon Primary School had to close for three days (Monday, Tuesday and Friday) and traffic had to be diverted due to the closure of Main Road.



Figure 5: School children crossing fields to bypass a flooded Main Road for onward transit to schools in Denton and Kettering where they were driven a long way around to avoid the flooding as, no alternative access exists © C. Dow

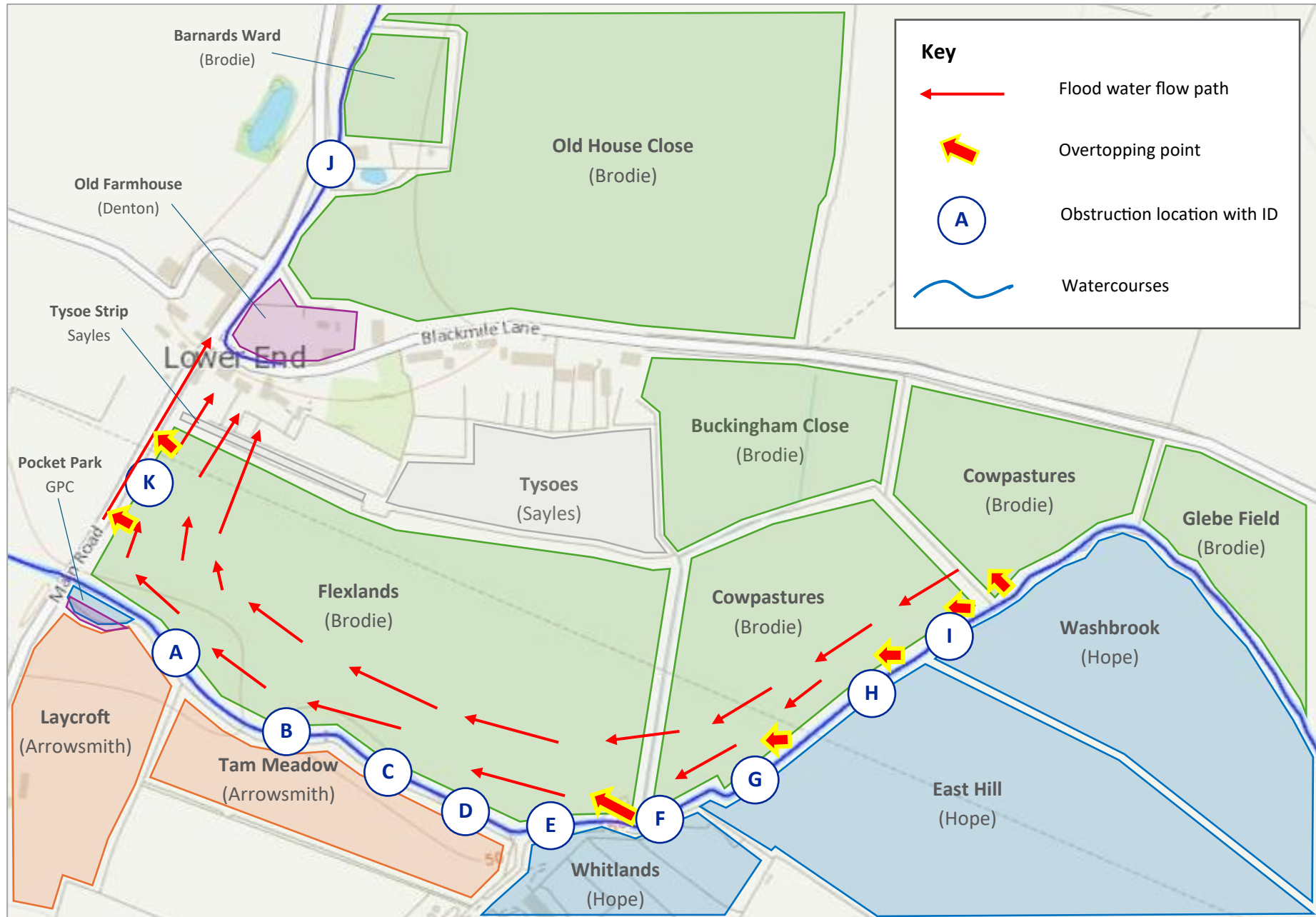


Figure 6: Map showing location of obstructions, overtopping points and flow path of floodwater. Map produced with the kind assistance of P. Goffey. © C. Dow

Flood water source and direction of flow

Stage One

Evidence along Grendon Brook between Main Road and the field known as Cowpastures (see figure 5) shows that the Brook backed up due to multiple obstructions in the channel and on both the north and south banks.



Figure 7: Vegetation and detritus on banks and in channel (Obstruction F) obstructing water conveyance in Grendon Brook. © C. Dow

Stage Two

These obstructions caused the water levels above the obstructions to rise beyond the level of the northern bank which no longer has a uniform height. At these low points, water from the Brook overtopped into the fields. Due to the topography of the fields, the floodwater then flowed both alongside the brook as well as within the fields in an east to west direction.

Whilst there are two field drainage ditches (between Flexlands and Cowpastures and the two Cowpastures fields) these were insufficient to divert the floodwater back into Grendon Brook. As the floodwater travelled through the fields (Cowpastures to Flexlands) it collected detritus which marks the extent of the flooding.



Figure 8: Video still taken from a Land Rover Discovery by 80 Main Road heading North at 20:50 on 22 Sept 2024, NOTE: the floodwater is level with the bonnet (circa 40inches deep) © E. Bilson.

Stage Three

On reaching the boundary of Flexlands and Main Road, the floodwater collected and built temporary dams of detritus (stubble stalks). The floodwater then increased in this area and due to the topography of the field it then spread northwards towards the rear of the properties on Blackmile Lane.

Stage Four

With no drainage ditches or natural features in Flexlands or the adjoining fields (Tysoes), the floodwater flowed through the field boundaries and into the rear of the properties in Lower End. At a similar time, the temporary dams along the boundary of Flexlands with Main Road were insufficient to hold back the weight of the floodwater which then burst through onto Main Road.

This floodwater then followed the slope of the Road into Lower End where it collected and built up. The ditch alongside Main Road as well as the road drains, were incapable of carrying the floodwater away.

Additionally, water collecting at Gibbards Arm was unable to be carried away in sufficient volumes to prevent further flooding at the junction of Blackmile Lane and Main Road.

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Floodwater collected at this location from the three sources (Main Road, the rear of properties, and Gibbards Arm). It then rose to a depth of at least 1.3m in Blackmile Lane where it entered properties and caused internal damage. Floodwater levels remained high for 48 hours.



Figure 9: Picture taken from 2a Blackmile Lane at 22:52 on Sunday 22 September 2024 showing depth of floodwater on the lane on rising ground © P. Knuff



Figure 11: Video still of floodwater entering No. 8 Blackmile Lane on Sunday 22 Sept 2024. (c) R. Blacklee



Figure 10: Video still of Internal flooding to No. 8 Blackmile Lane on Sunday 22 Sept 2024. NOTE water entering via door in background. (c) R. Blacklee

Subsequent flooding

Heavy rainfall occurred again overnight of Thursday 26 / Friday 27 September 2024. This caused significant flooding to Lower End although not sufficient for it entering properties. It is felt that this followed the original flow routes which combined with the volume of rain led to the existing drainage systems failing.



Figure 12: Photo of subsequent flooding by number 4 Blackmile Lane at Fri 27 Sept at 03:30. © N. Blacklee

General Photos



Figure 14: Height and flow speed of floodwater at junction of Blackmile Lane and Main Road on morning of Monday 23 Sept 2024. (c) C. Dow



Figure 13: Height of floodwater at No. 10 Blackmile Lane on morning of Monday 23 Sept 2024. (c) C. Dow



Figure 15: Height of floodwater at No. 2 Blackmile Lane on morning of Tuesday 24 Sept 2024. (c) C. Dow



Figure 17: Vegetation on both banks and in channel of Grendon Brook (Obstruction E). (c) C. Dow



Figure 16: Example of a breached detritus dam from Flexlands onto Main Road at Obstruction K. © C. Dow

Likely causes of incident

Evidence gathered immediately after the flood from the Brook, Gibbards Arm and surrounding areas strongly suggests that four factors combined to cause this flood incident:

- 1) Exceptionally heavy rainfall over a short period of time (three times the monthly average rainfall in 24 hours or 150mm) on an already saturated catchment and collected in the Grendon Brook;
- 2) Multiple obstructions along the banks and bed of Grendon Brook restricted the water conveyance and most likely caused it to be held up and pool at a point adjacent to the field boundaries of Cowpastures East and West;
- 3) The height of the northern bank of Grendon Brook is uneven with numerous low points having formed. These were exploited by the water held back by obstructions, allowing floodwater to overtop the banks and sweep across the adjacent fields (Cowpastures East, Cowpastures West and Flexlands) before pushing through onto Main Road and the rear of properties on Blackmile Lane;
- 4) Drainage on the route taken by the flood water across the fields, along Main Road and north to Summer Leys and the River Nene via Gibbards Arm was compromised by:
 - a. lack of capacity;
 - b. poor state of repair, and;
 - c. obstructions (garden waste, cut tree branches and structures) within the channel.

See Appendix One for images showing examples of obstructions in the Grendon Brook and other watercourses.

Whilst there is currently no viable way of managing the flood risk posed by exceptional rain fall, the other contributory factors can be controlled.

This might be achieved by ensuring all the main river channels and drainage systems are working as intended with no obstructions, debris or structures present. It can be argued that they work in conjunction with each other as a single system or network, which in turn is weakened and made less effective at protecting Lower End if one or more elements is not working as it should.

In the interest of reducing the risk of this incident being repeated, it is strongly suggested that parties responsible for the maintenance and repair of the river and adjacent drainage systems should take prompt action to remedy any shortcomings and obvious points of failure as the winter flood season is only just beginning.

Recommendations

Environment Agency (EA)

- Inspect those assets it is responsible for maintaining and put in place an urgent programme of repairs to ensure they are operating as designed
- Review the longer-term flood risk to Lower End in light of this latest incident and investigate potential flood defence measures to prevent, or mitigate as far as possible, any reoccurrence
- Liaise with local landowners to ensure they:
 - understand their responsibilities as riparian owners
 - know what permits and authorisations are required for the any work they need to undertake on their land
 - provide support and advice on the application process where necessary
- Guide residents to the support they can access such as property level resilience and funding for repairs and improvements
- Liaise with local landowners, residents and other stakeholders (Parish Council) to:
 - Gain support and minimise opposition for any repairs and potential future flood defence proposals
 - Reduce miscommunication and conflict
 - Build on local knowledge to make better decisions
 - Increase mutual trust and ensure the decision making process is open and transparent
 - Ensure all parties are complying with their legal obligations
 - Encourage practical support for any works tasks in the form of work parties wherever possible

North Northamptonshire Council (NNC)

- Inspect those assets it is responsible for maintaining and put in place a programme of repairs to ensure they are operating as designed
- Promptly carry out a Section 19 Flood Investigation ensuring all recommendations are made public and enacted where feasible
- Liaise with flooded residents to ensure they receive any and all support available
- Work with landowners and residents to ensure they understand their responsibilities, how to get help in carrying out their responsibilities and where to get support as required
- Work closely with the Environment Agency and Landowners to ensure any permits / authorisations for repairs and maintenance work are granted as swiftly as possible
- Cooperate with landowners, the Environment Agency and residents to ensure any proposals for flood defences are assessed as promptly as possible
- Develop a more effective way of working with Northamptonshire Police to ensure Main Road is closed to traffic as soon as flooding occurs to prevent danger to lives, loss of vehicles in floodwater and repeat flooding of damaged properties by bow waves of passing vehicles
- Liaise with local landowners, residents and other stakeholders (Parish Council) to:
 - Gain support and minimise opposition for any repairs and potential future flood defence proposals

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- Reduce miscommunication and conflict
- Build on local knowledge to make better decisions
- Increase mutual trust and ensure the decision making process is open and transparent
- Ensure all parties are complying with their legal obligations
- Encourage practical support for any works tasks in the form of work parties wherever possible

Landowners

- Seek the advice of the Environment Agency and North Northamptonshire Council (NNC), on how best to proceed with any works
- Liaise with NNC and Environment Agency to ensure all applicable permits (FRAPs) are in place before starting any works
- Remove any obstructions and vegetation found along the banks of Grendon Brook and Gibbards Arm, ensuring this regularly carried out each year
- Promptly start a prioritised programme of ditch and drainage repairs and maintenance, ensuring this is regularly carried out each year
- Collaborate with residents and Grendon Parish Council to practically assist with any works wherever possible (work parties)

Grendon Parish Council (GPC)

- Be a source of information for residents and landowners on flood risk reduction measures and financial support for flood recovery
- Keep landowners and residents informed of any developments
- Facilitate meetings of residents, landowners, NNC and the Environment Agency to develop practical and effective plans for reducing flood risk
- Review the role of GPC and its ability to assist the above partners where appropriate when clear plans have been made for action / works
- Investigate the possibility of forming a local Flood Action Group (FLAG)
- Review and update the existing village Emergency Plan and investigate the practicality of developing a flood plan for the residents of Blackmile Lane with input from North Northamptonshire Council and the Environment Agency
- Work with North Northamptonshire Council and the Local Resilience Forum (LRF) to investigate whether a more effective and timely method of notifying the authorities of rapid flooding and the closure of Main Road.
- Ensure all GPC owned land adjacent to a watercourse is maintained to ensure effective waterflow

Appendix One: Obstructions



Figure 18: Obstruction H with high water levels in Grendon Brook. © C. Dow



Figure 19: Obstruction H during subsequent low water levels in Grendon Brook with resident for scale showing size and extent of blockage as well as difference in water levels up and down stream of obstruction, illustrating its effect at holding back water. © C. Dow



Figure 20: Obstruction J on Gbbards Arm showing overgrown channel banks and bed. © C. Dow



Figure 21: Obstruction K showing overgrown and filled in condition of ditch along Main Road adjacent to Flexlands field running to Grendon Brook. Note mature tree growing in centre of ditch. © C. Dow

Appendix Two: Glossary

Catchment

A river catchment is an area of land where water, be it from rainfall, snowmelt, or ice, collects from higher areas above it

Conveyance

The process or mechanism of carrying or transporting water in a watercourse from one place to another.

Fluvial flooding

Flooding caused by water from any river or stream source

FRAP

Flood Risk Activity Permit (FRAP) an environmental permit granting permission to carry out any regulated activity on or near a main river. Issued by the Environment Agency, more information can be found at: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Main River

Main rivers are the larger rivers which have a major effect on the drainage within a catchment area.

Ordinary watercourse

Any small rivers, streams and ditches. No flood risk permits are required to work on 'ordinary watercourses' however, land owners should contact the local council or [internal drainage board](#) to check if land drainage consent is needed

Pluvial flooding

Fooding caused by surface water.

Riparian Owner

A riparian owner is one who has either a main river or an ordinary watercourse, such as a stream or culvert, running through, beneath or adjacent to the boundary of their land. If the watercourse forms the boundary of the land, it is usually owned up to its centre.

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End