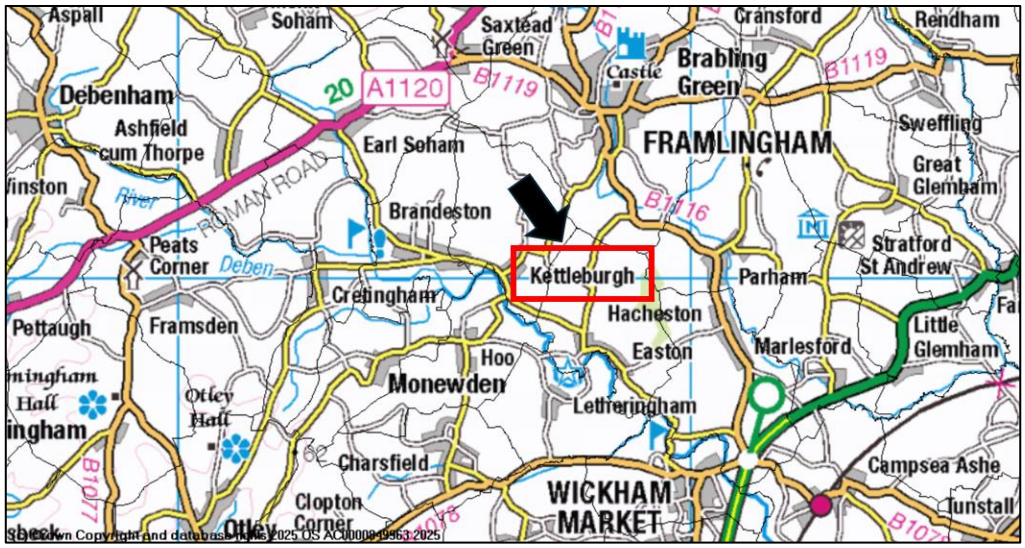
Section 19 Flood and Water Management Act 2010

Kettleburgh Flood Investigation

Storm Babet 2023



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Suffolk Flood Risk Management Partnership

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Executive Summary

Storm Babet caused significant disruption to communities across Suffolk between 18th - 21st October 2023. Kettleburgh was a community that was significantly impacted, with approximately six properties suffering internal flooding as well as disruption to infrastructure and services. Suffolk County Council, as Lead Local Flood Authority, have therefore undertaken a Section 19 Flood Investigation. The resulting report will:

- highlight the probable causes of flooding
- identify options to reduce future flood risk and increase property resilience
- make recommendations for actions by relevant responsible organisations, landowners or homeowners.

Kettleburgh is located in an area at significant risk of both fluvial and pluvial flooding and the nature of the surrounding topography and geology contributes to the susceptibility of the community to flooding. Areas of Kettleburgh are low-lying, surrounded by a rural catchment which is relatively shallow in parts and steeper to the north of Kettleburgh village. Multiple flood water flow paths converge near to the low-lying areas, where the gradient is noticeably shallow. The local geology and soils are susceptible to high run off, making a high number of properties in the village vulnerable to flooding due to intense rainfall events.

Storm Babet delivered significant rainfall to the catchment, following an extended period of above average rainfall. Impacts within Kettleburgh were widespread and for the purposes of this report, the affected areas have been categorised into three zones. The description of the flood events detailed in the report have been compiled using data submitted to Suffolk County Council, as well as information from Risk Management Authorities (e.g. Suffolk County Council Highways and Anglian Water) and the community.

A comprehensive summary for each zone is provided within the report, outlining the context of the event and the impact. Key findings are that Kettleburgh was severely impacted by flooding due to the intensity and duration of rainfall which overwhelmed the natural flow routes and the capacity of watercourses and drainage infrastructure. This situation was compounded when overland flow paths converged and saw the resultant internal flooding of property.

Short, medium and longer term recommendations have been published and each have a potential role to improve resilience and reduce the risk of flooding to Kettleburgh. For short term measures, key highlights include the implementation of a community flood plan and maximising Property Flood Resilience (PFR) grants. For medium to longer term recommendations, there is emphasis on the management of water from rural land though new natural flood management features, to reduce flood risk within the catchment.

Justification for Investigation

Suffolk County Council, Lead Local Flood Authority (LLFA) has determined that in accordance with our criteria, it is considered necessary and appropriate to carry out an investigation into this flood event.

This is in accordance with Section 19 (1) of the Flood and Water Management Act 2010, and in accordance with Section 19 (2) of the Flood and Water Management Act 2010, to publish the results and notify the relevant risk management authorities (RMAs).

Section 19 Local authorities: investigations

(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 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*

Criteria for an investigation (as per Appendix D of the Suffolk Flood Risk Management Strategy):	
There was a risk to life because of flooding?	
Internal flooding of one property (domestic or business) has been experienced on more than one occasion?	
Internal flooding of five properties has been experienced during one single flood incident	✓
Where a major transport route was closed for more than 10 hours because of flooding	
Critical infrastructure was affected by flooding	
There is ambiguity surrounding the source or responsibility of a flood incident	

Understanding the flood context

1. What happened during Storm Babet

A succession of weather fronts between the 11th and 13th of October 2023 brought significant rainfall to the region. Readings indicate that between 30mm and 50mm of rain fell across Suffolk compared with an average of just less than 65mm across the whole month of October according to Meteorological Office weather data (Met Office, 1991- 2020). This significant rainfall in a short space of time resulted in saturated land and rivers reaching their capacity. Shortly after this, Storm Babet followed on the 18th to 21st of October 2023. The storm brought between 50 mm and 80 mm of rain to much of central and northern East Anglia, with some Suffolk weather stations recording the wettest October day on record.

The Environment Agency River level gauging stations indicated many flows close to or exceeding their highest on record, and the weather remained wetter than average for the rest of the month. October 2023 was the joint wettest on record in the east of England since 1871. During Storm Babet, Suffolk saw the heaviest rainfall across East Anglia causing significant flooding of roads and properties. The river systems rose rapidly across whole catchments due to the existing conditions, which was unusual as storms will often impact a small area and result in a steady progression of flood water downstream. A major incident was declared by Suffolk Resilience Forum (SRF) in the afternoon of the 20th of October due to significant impacts on communities and disruption to the road and rail networks.

The following maps illustrate the extent to which the rainfall in the months preceding Storm Babet exceeded the average monthly rainfall for July to October in recent years in Suffolk.

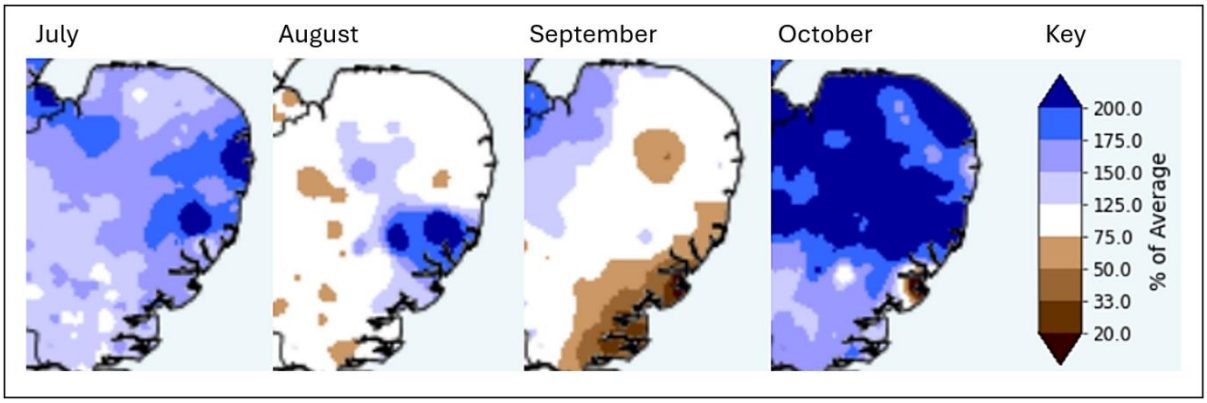

Fig. 1. Average monthly rainfall (July – October 2023) as a percentage of the historic average monthly rainfall

The following report acknowledges that October 2023 and particularly Storm Babet, was an extreme event and will assess the probable causes and impacts. The report will recommend measures to reduce the risk of flooding within the location, in line with best practice, ranging from large to small scale interventions and be targeted at a range of stakeholders. It should be noted that Storm Babet was a significant event,

with a low probability of recurrence. The recommendations will provide advice about reducing flood risk. However, they should not be relied upon as a guaranteed failsafe to mitigate against all future flooding.

2. Location of flooding

The village of Kettleburgh is located in the district of East Suffolk District Council, approximately two miles southwest of Framlingham and three and a half miles northwest of Wickham Market (Fig. 2).

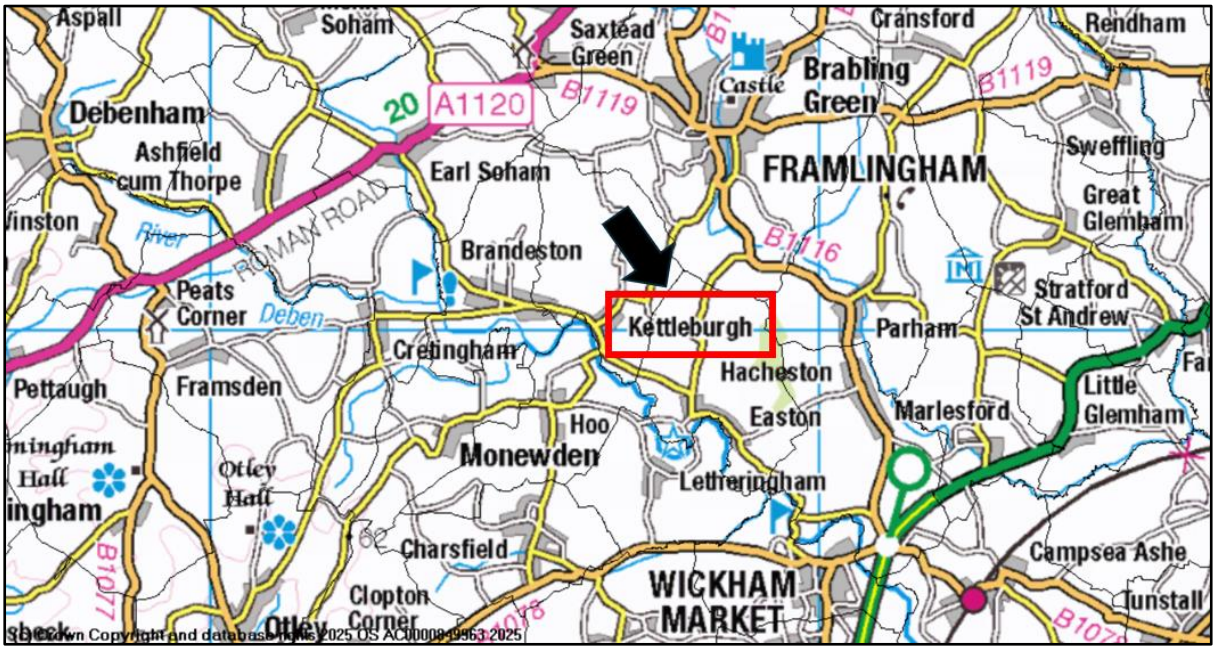

Fig. 2. Investigation area map

Fig. 3 shows the most significant watercourses in and around Kettleburgh. It includes the River Deben, a statutory main river.

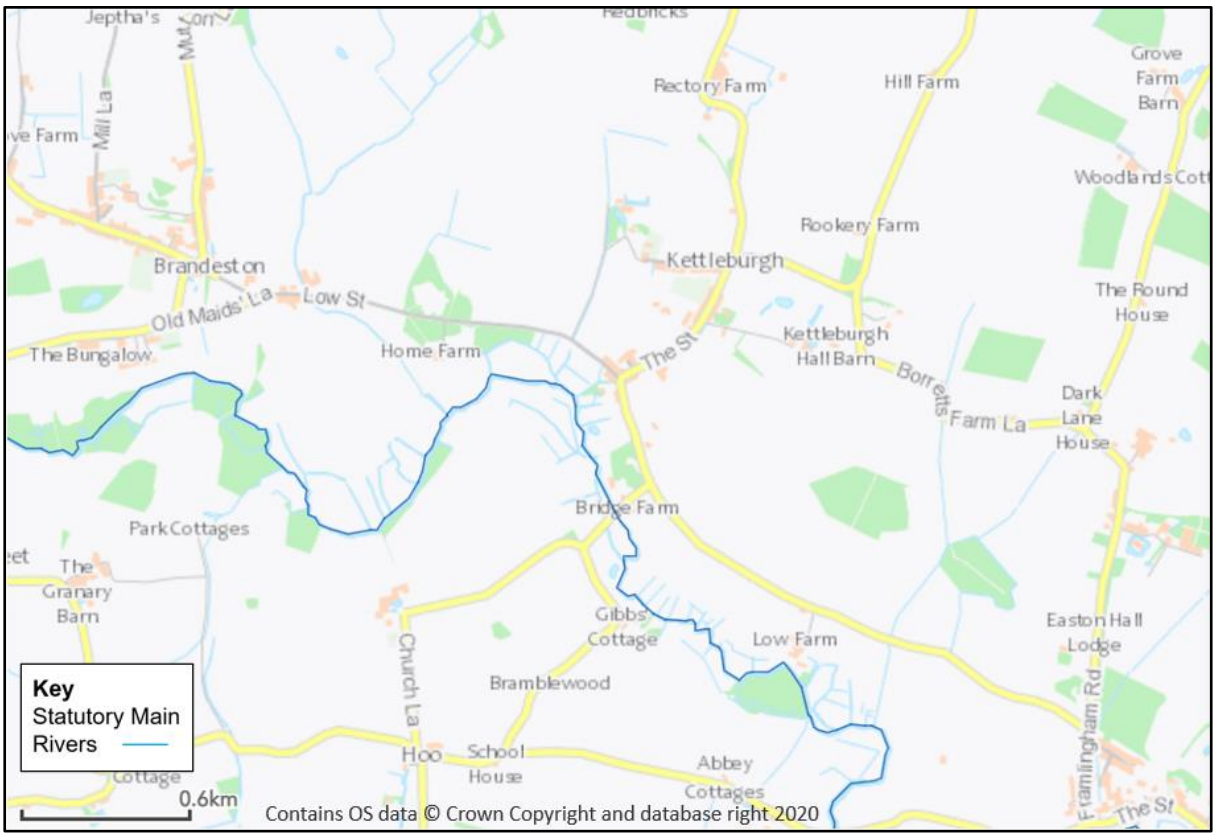

Fig. 3. Location of statutory main river – River Deben (Environment Agency)

The Environment Agency has permissive powers to carry out maintenance, improvement or construction work on statutory main rivers to manage flood risk. Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards (IDBs) manage the flood risk from ordinary watercourses but responsibility for maintaining watercourses rests with the Riparian Landowner, defined as those who have a river, stream or ditch which runs next to or through their land or property.

The local Internal Drainage Board is the East Suffolk Water Management Board (ESWMB). It oversees a gravity catchment (CMT184G) within the Internal Drainage District adjacent to Kettleburgh and the River Deben. Fig. 4 shows the location of the arterial watercourse named Kettleburgh Drain (DRN184G0901) located to the west of The Street and Low Street road junction. ESWMB 'adopted' this section of ordinary watercourse into its maintenance schedule and named it Kettleburgh Drain in 2020. This arterial watercourse is categorised as a Medium Priority watercourse. It is not owned by the Board and the designation does not change the underlying ownership by respective landowners along its length. The Board carries out maintenance on a recurrence deemed necessary to meet water level requirements. Kettleburgh Drain (150 linear metres) is typically maintained by hand in March each year from the road culvert towards its confluence with the River Deben. The works involve walking the channel and clearing vegetation using brush cutters, chainsaws and hedge cutters.

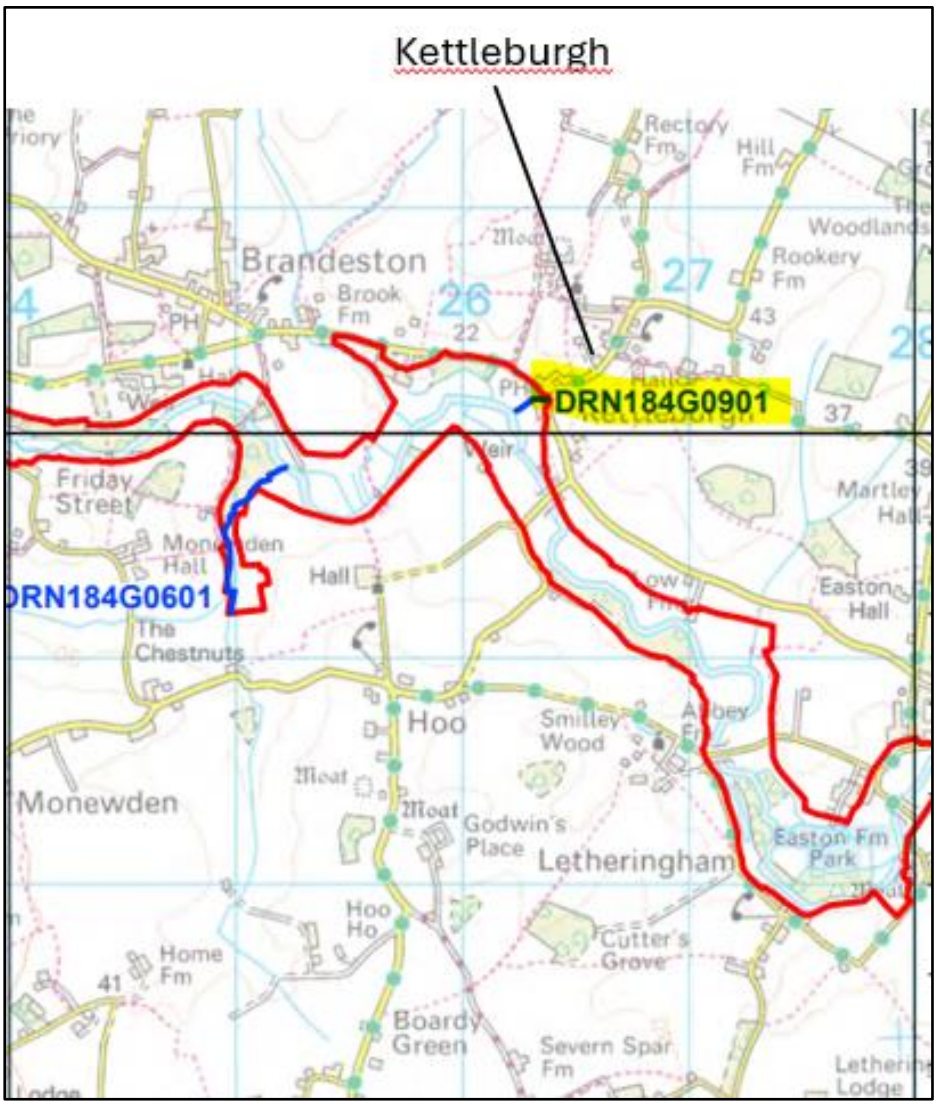

Fig. 4 East Suffolk Drainage Board Catchment Management Area CMT184G (in red) showing location of drain DRN184G0901

On the 20th October 2023, Storm Babet resulted in significant rainfall across Suffolk on already saturated ground due to above average rainfall in the preceding weeks. Kettleburgh was significantly impacted with approximately six properties reporting internal flooding. Flood water was described as coming from several sources including surface water runoff from surrounding fields (pluvial), the overtopping of local watercourses (fluvial) and overwhelmed drainage systems. Within this report, the term 'flood water' may be used to describe all types of flooding.

For the purposes of this investigation the various areas affected by flooding have been separated into three distinct zones:

1. The Street
2. Mill Lane
3. Low Street

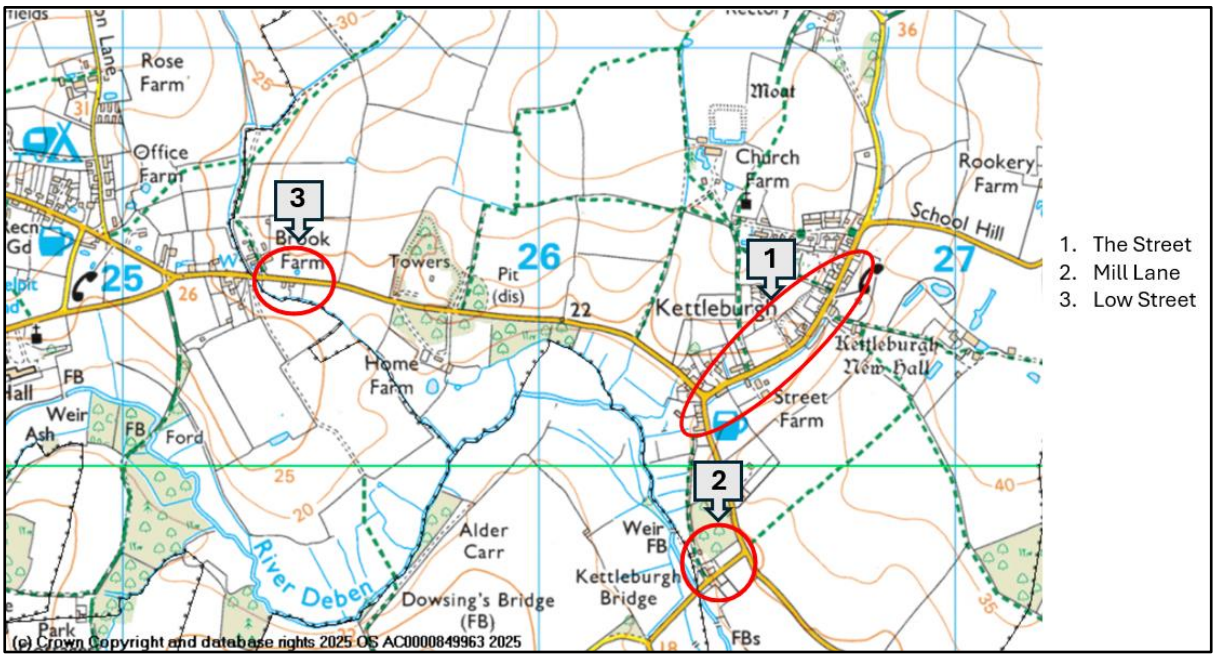

Fig. 5. Distinct flood zones

3. Records of any historical flooding

A review of Suffolk County Council's Highways reporting tool, local and social media reports indicated previous incidents of internal flooding of property in Kettleburgh in 2012, 2017 and on 27th November 2019 and during the week commencing 15th December 2019. A further flood event was experienced in 2020 and a S19 Flood Investigation report was published by the LLFA. Full details can be found on the SCC website. Flooding was concluded to be the result of heavy rainfall overwhelming watercourses and drainage infrastructure.

ESWMB 'adopted' the section of ordinary watercourse into its maintenance schedule and named it Kettleburgh Drain in 2020 in response to a flooding event on 27th November 2019, when the Parish Council reported that five properties had suffered flooding to the dwelling and/or outbuildings.

4. Predicted Flood Risk

The parish of Kettleburgh is at significant risk of pluvial (surface water) flooding (Fig. 6). One significant area projected to have a high chance of surface water flooding is located along the east side of The Street and across the road junction with Low Street to the River Deben. Surface water flood risk ranging from low to high chance of flooding is associated with all the affected property in The Street.

Other significant areas projected to have a high chance of surface water flooding converge to the east of Brandeston and north of Low Street, contributing to a high chance area of surface water flooding on the north side of Low Street. However, affected property on the south side of Low Street, to the west of the main village, is projected to be partly at low chance and partly at no chance of surface water flooding.

Mill Lane itself, but not affected property on Mill Lane, is projected to be at low risk of surface water flooding. It should be noted that low chance of flooding indicates a flood risk during extreme events, such as Storm Babet.

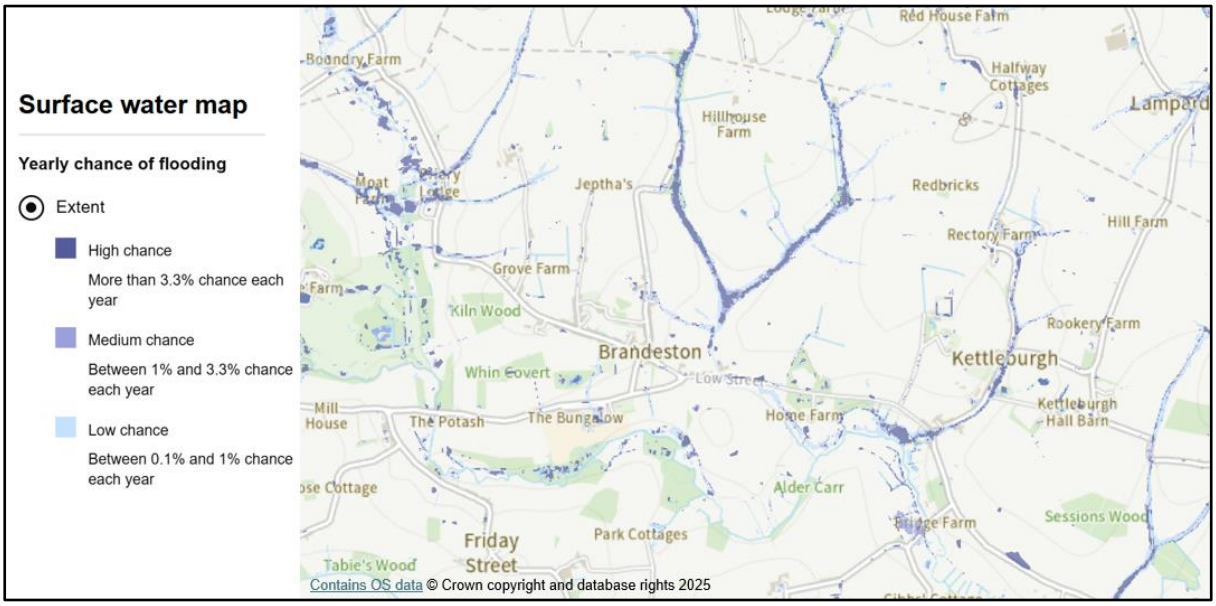

Fig. 6. Predicted flood risk from surface water

Fluvial flood risk in Kettleburgh parish is associated with the River Deben and tributaries including one tributary which flows under Low Street to the west of Kettleburgh village (east of Brandeston). Affected property on the south side of Low Street is projected to be at low and medium risk of fluvial flooding. Affected property in Mill Lane is projected to be at high fluvial flood risk.

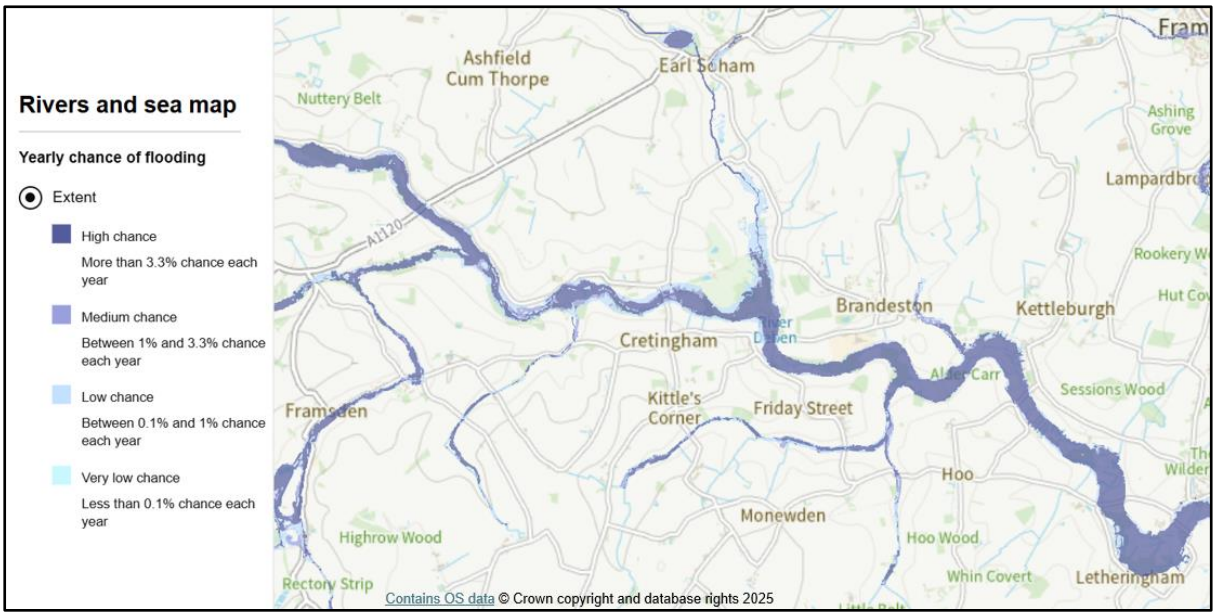

Fig. 7. Predicted flood risk from rivers

5. Catchment characteristics

The parish of Kettleburgh is situated in the wider River Deben valley in a rural location with farmland used primarily for arable agriculture, grassland and pasture. A significant tributary flows south under Low Street approximately half a mile west of Kettleburgh and joins the River Deben approximately quarter of a mile west of the village. The Street lies in the base of a valley which also has a watercourse on the east side of The Street, flowing southwest towards the River Deben.

The low-lying nature of Kettleburgh means that during high rainfall events considerable flows of water converge towards the village (see Fig. 8). Overwhelmed infrastructure and watercourses may be observed during these intense rainfall events.

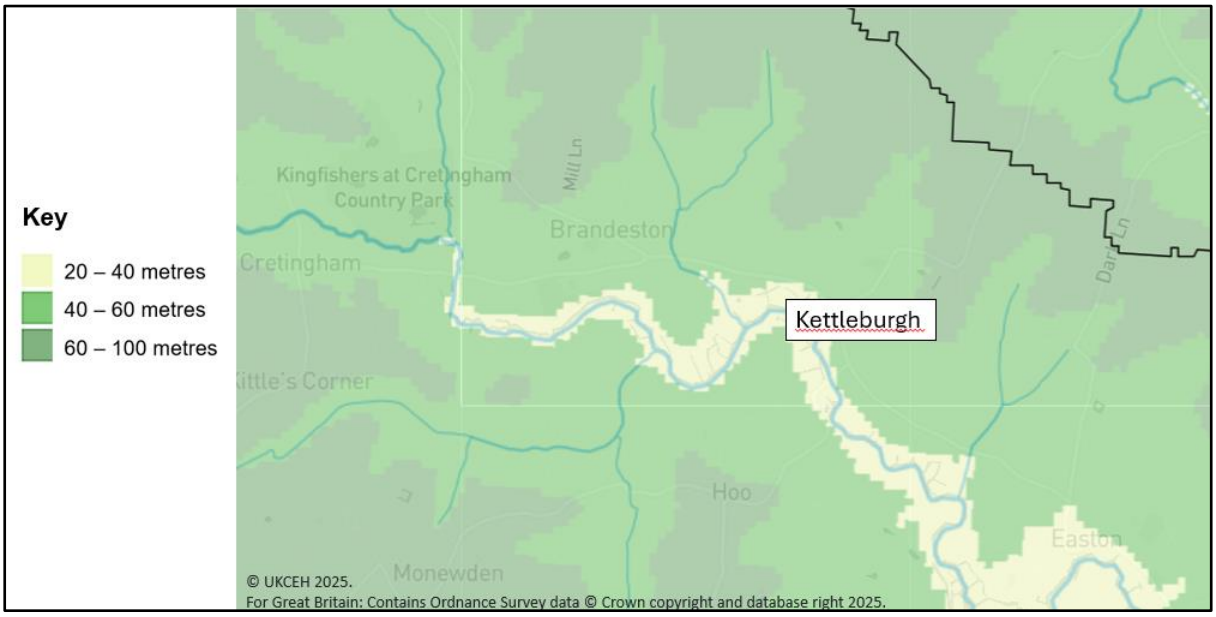

Fig. 8. Elevation map of catchment area (showing Deben at Naunton Hall gauging station catchment boundary - black line) (National River Flow Archive)

The soils surrounding Kettleburgh are loamy and clayey with impeded drainage, meaning that water permeates more slowly, and surface water runoff is greater, particularly during intense rainfall (Fig. 8). However, the saturated nature of the soils leading up to the event would also have prevented some infiltration.

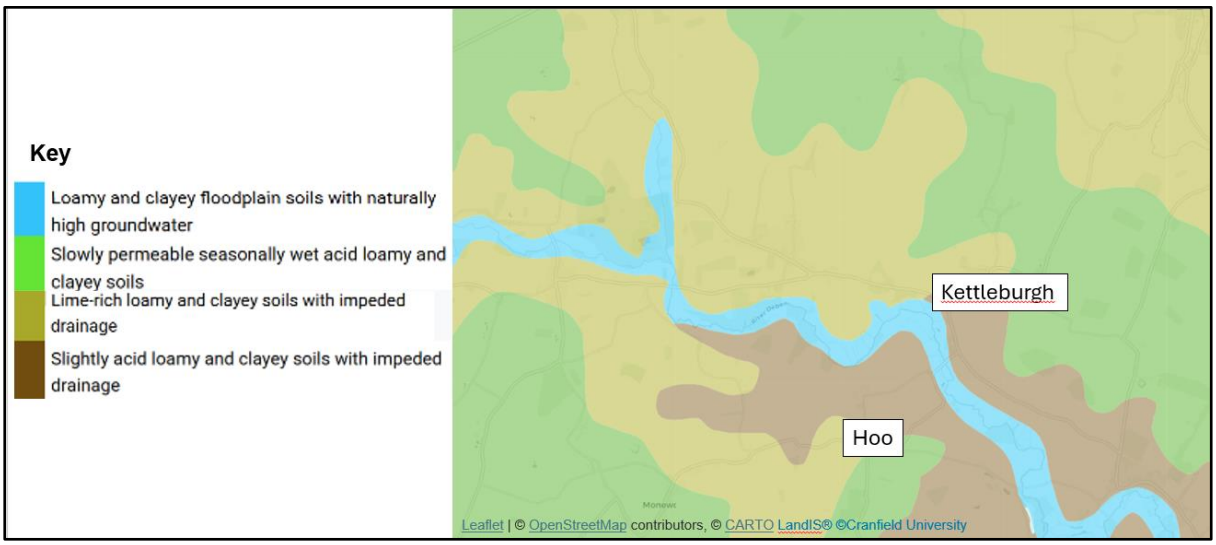

Fig. 9. Soil map of catchment area (LandIS Soilscapes)

Fig. 9 shows that much of the superficial geology surrounding Kettleburgh is made up of 'Lowestoft Formation – Diamicton' which is described by the British Geological Survey as a diverse mixture of clay, sand, gravel, and boulders varying widely in size and shape. This is sometimes known as boulder clay. This generally has a low permeability meaning water will tend to flow off it before it can infiltrate, which also reflects the reports collected during Storm Babet.

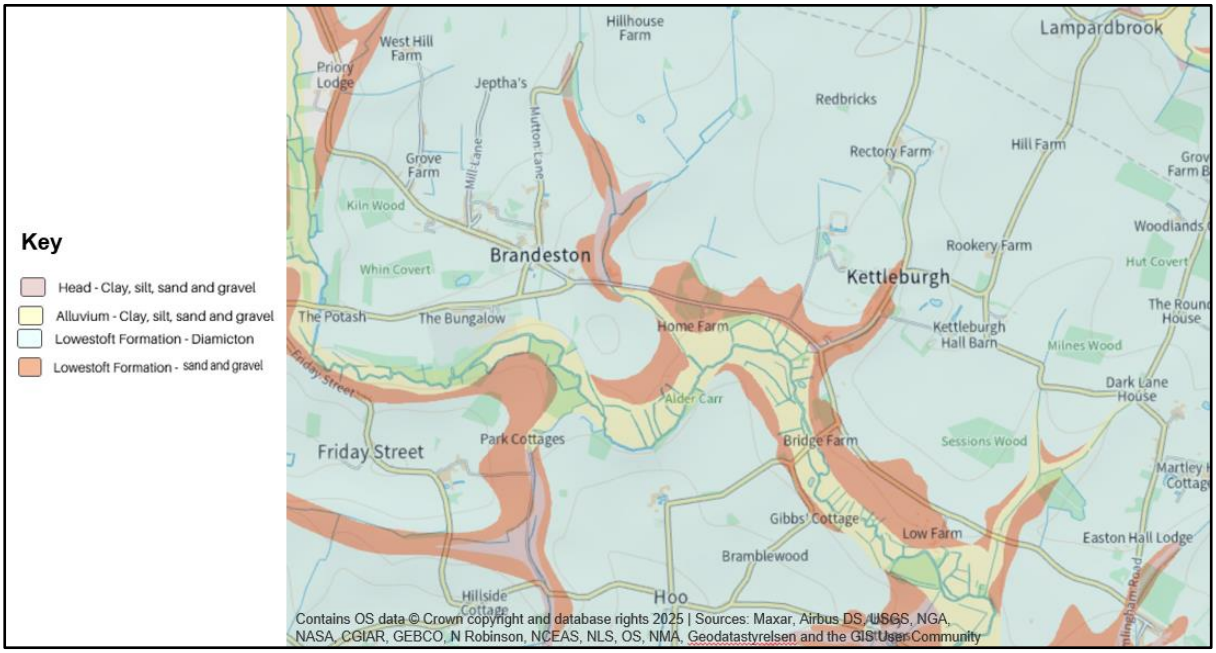

Fig. 10. Superficial geology (British Geological Society)

The bedrock in Kettleburgh and in the surrounding upstream area of the catchment consists of Lewes Nodular chalk formation and Crag Group - sand. However, during short term intense rainfall events, soil composition and superficial geology become more influential in affecting the volume of surface water runoff. Combined with the

topography within the catchment, these make Kettleburgh susceptible to extreme rainfall events. Saturated ground and high rainfall, like that of Storm Babet, will further emphasise the vulnerability of the parish and localised flooding could be experienced.

Flooding Sources, Pathways & Receptors

Storm Babet was an extreme event which came at a time when Suffolk had experienced a significant amount of rainfall in the preceding weeks.

Data from surrounding Environment Agency rain gauges indicates that a significant volume of rain was experienced during Storm Babet. The nearest rainfall gauge to Kettleburgh is Benhall, which recorded almost its entire rainfall for 20th October 2023 between 1.15am and 16.15pm at 48.2mm. 16.8mm of this was received between 9:45am and 11:15am.

The Environment Agency issue two types of warning when flooding is possible from a main river. These are:

1. Flood Alert – Flooding is possible. Be prepared. - usually issued between 2 and 12 hours before flooding.

2. Flood Warning - Flooding is expected. Immediate action required – usually issued 30 minutes to 2 hours before flooding.

The Street, Kettleburgh is not covered by the Environment Agency's flood warning service and as such, flood alerts and warnings are not issued for this location.

Flood Alerts are available for the area at risk of flooding from the main river Deben. As such, there are a number of properties within the Mill Lane and Low Street localities which are within the Flood Alert area of the River Deben and Lark. The flood alert for this area was issued on 18th October 2023 and remained in force until it was removed on 24th October 2023.

Although The Street and Low Street are not within the areas covered by Flood Warnings, there are properties at Mill Lane within and adjacent to the Flood Warning area for the 'River Deben from downstream of Cretingham to Ufford'. A Flood Warning was issued for this area on 20th October 2023 at 15:44, and remained in force until it was removed on 22nd October 2023.

The description of the flood events described below will discuss the probable sources of flooding, the observed flow paths through the community and the receptors which have been affected. The term 'floodwater' may be used to describe both fluvial (water from a watercourse) and pluvial (surface water run-off) flooding. This section has been prepared using reports submitted to Suffolk County Council via the online Highways Reporting Tool, community data and site visits.

Detailed descriptions of each investigation area can be found below.

1. The Street

Three properties are known to have flooded internally in this area. Property on the east side of The Street, south of the junction with School Hill, reported being flooded by surface water from fields to the east. (In this area, the watercourse east of The Street is culverted). Maintenance visits by SCC highways confirmed the highway gullies in the immediate vicinity were functioning before and after Storm Babet, and instead the volumes of water experienced probably exceeded their designed capacity. This area is projected to be at a high chance of surface water flooding and no fluvial flood risk.

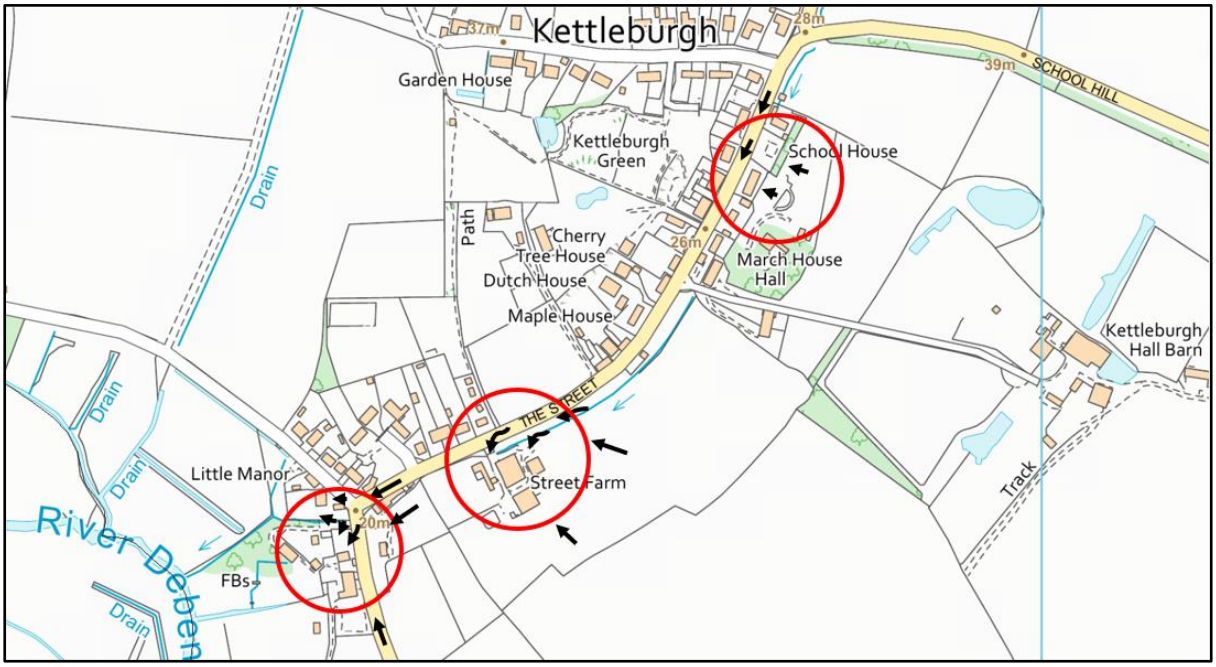

Fig. 11. Approximate floodwater flow paths, The Street

Further southwest on The Street, on the southeast side, property was flooded by the overtopping watercourse and surcharging manholes. Surface water also flowed from fields to the east. Affected property here is projected to be at high surface water flood risk and no fluvial flood risk. However, flood risk may have been increased by culverted sections of the watercourse which may have constricted the flow of water. Floodwater from surcharging manholes was reported to contain sewage, reported as being behind and beside affected property. Sewage flooding probably occurred from private septic tank arrangements as well as flooding from the sewer in the vicinity on The Street. The highway gully closest to affected property was reported to be functioning, suggesting the drainage system was overwhelmed by the extreme rainfall. A lower-level driveway relative to the highway exacerbated the risk of flooding, directing flood water to property.

Southeast of the junction between Low Street and The Street, property was reported to have flooded to an internal depth of approximately 25cm from surface water runoff

and an overtopping watercourse. Property here is in close proximity to Kettleburgh Drain (DRN184G0901) and flooding was partly attributed to a lack of maintenance, although maintenance is conducted on an annual cut and clear cycle by East Suffolk Water Management Board. Affected property here is projected to be at high surface water flood risk and no fluvial flood risk. Some of the gullies in the vicinity may not have been fully functioning at the time, as they were not fully functioning at the ensuing maintenance visits (although they have since been cleared). However, in the extreme rainfall conditions, the capacity of the wider drainage system, even if fully functioning, would have been limited, as water levels would have exceeded their design capacity.

Anglian Water investigations regarding flooding in The Street during Storm Babet showed minor debris, roots, fat, oils and grease deposits in the sewer network which were jetted clear. A combined sewer overflow, to which a gully adjacent to the ESWMB drain DRN184G0901 connected, had been blocked off previously, causing water from the gully to flow to the sewage pumping station. The ESWMB drain overtopping contributed floodwater to this flow through the gully. In the extreme rainfall, the sewage pumping station was overwhelmed, causing floodwater and sewage to back up in some property and manholes in The Street. The gully adjacent to the ESWMB drain has since been removed.

In 2020, SCC Highways investigated the culverted section of the watercourse adjacent to The Street, close to the junction with Low Street and under the highway. The investigation indicated that some of the private culverted sections of the watercourse were in poor condition and would probably contribute to backing up of water and consequent flooding, which may have contributed to further surface water on The Street, flowing towards the junction with Low Street. Private watercourses are the responsibility of the riparian owners to manage and maintain.

Significant quantities of surface water flows into field ditches north of the Street before connecting to the primary watercourse on the east side of The Street. Reducing peak flows upstream of the watercourse on the east side of The Street using natural flood management measures, such as leaky dams and attenuation ponds, has the potential to reduce the risk of the watercourse overtopping further downstream, which at present, contributes to flooding of property and infrastructure.

In summary:

- Intense and prolonged rainfall exceeded the capacity of field drainage and surface water flowed across fields on the east side of The Street, flooding property south of the junction with School Hill.
- Further south, on the east side of The Street, property was flooded by an overtopping watercourse and surface water runoff from fields. Floodwater was reported to be contaminated with sewage from surcharging manholes.

- The sewage pumping station was overwhelmed by the considerable quantities of water entering the network via a gulley (now removed), causing floodwater and sewage to back up through the drainage system.
- Quantities of flood water on The Street may have been exacerbated by the poor condition and constrictions of culverted sections of the watercourse, causing the watercourse to overtop.
- South of the junction of Low Street and The Street, property was reported to be flooded from an overtopping watercourse and surface water run-off.
- Due to the extreme rainfall conditions, the capacity of the wider drainage system, even if fully functioning, would have been limited, as water levels would have exceeded their design capacity.
- Lower-level driveways relative to highways exacerbated the risk of flooding.

Recommended actions:

- Residents to install Property Flood Resilience (PFR).
- Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to “slow the flow” and attenuate water in the upper catchment of the watercourse on The Street.
- Landowners to carry out watercourse maintenance, including culverts, to reduce flood risk as necessary in accordance with their riparian responsibilities.

2. Mill Lane

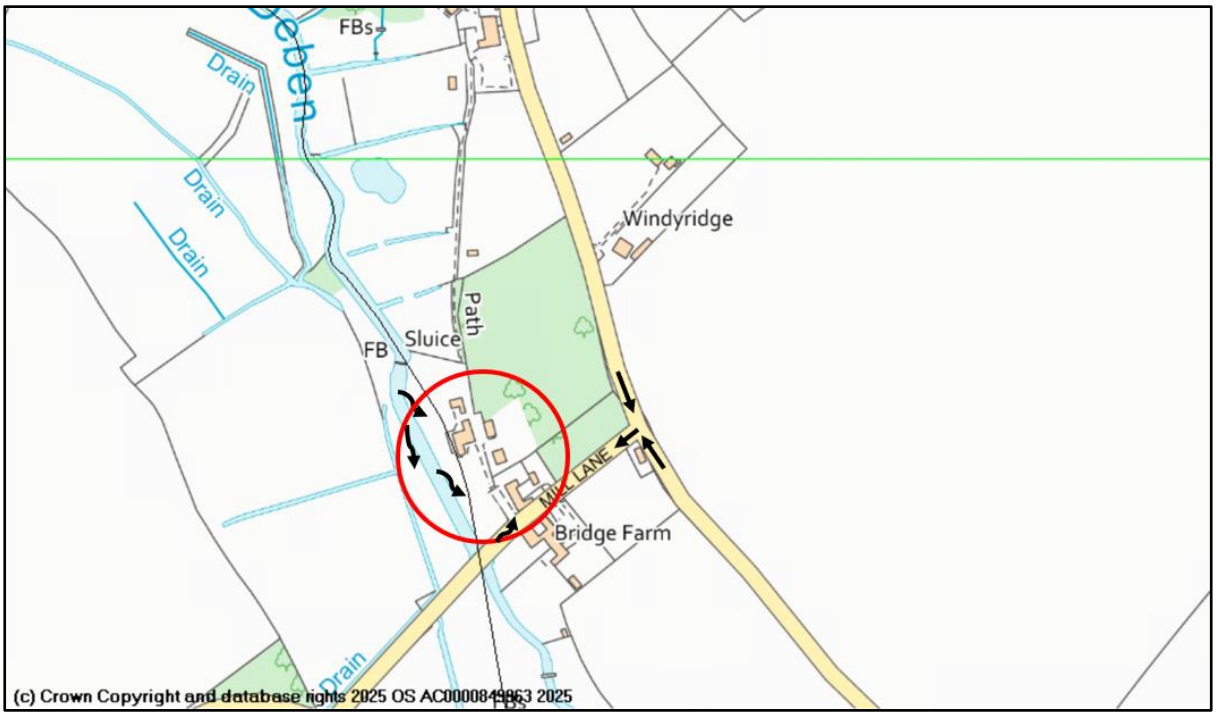

Fig. 12. Approximate floodwater flow paths in Mill Lane

One property was reported to be internally flooded in Mill Lane. Affected property was projected to be at no risk of surface water flooding and high risk of fluvial flooding. Extreme rainfall caused the River Deben to overtop, contributing to flooding in the vicinity. Highway drains in Mill Lane were reported to be blocked during Storm Babet (and on previous occasions). However, due to high river levels during Storm Babet, it is probable that the gullies would not have been able to discharge into the river, due to outfalls being submerged. Surface floodwater flowed down a driveway towards affected property. Surface water also flowed into Mill Lane from higher levels on Easton Road. In June 2024, the highways drainage system in Mill Lane was jetted and all roots, silt and debris were removed and cleared to the outfall to the River Deben.

In summary:

- Extreme rainfall caused the River Deben to overtop.
- Highway drains in Mill Lane were reported to be blocked.
- Surface water flowed down a low-level driveway.

Recommended actions:

- Residents to install Property Flood Resilience (PFR).
- Suffolk Highways to investigate the causes of blocked highway drainage in Mill Lane.
- Suffolk Highways to review frequency of maintenance cycle of highway drainage in Mill Lane and amend as necessary .
- Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to “slow the flow” and attenuate water upstream in the River Deben catchment.

3. Low Street

The westernmost area where property was affected by internal flooding was on the south side of Low Street (Fig. 13). Two properties are known to have internally flooded, reaching a level of approximately 120cm. Affected property on this section of Low Street is projected to be at medium risk for fluvial flooding and no risk of surface water flooding. Flooding was reported to be due to the brook behind affected property exceeding capacity in extreme rainfall and overtopping. Floodwater also flowed from nearby fields onto the road and down lower level driveways.

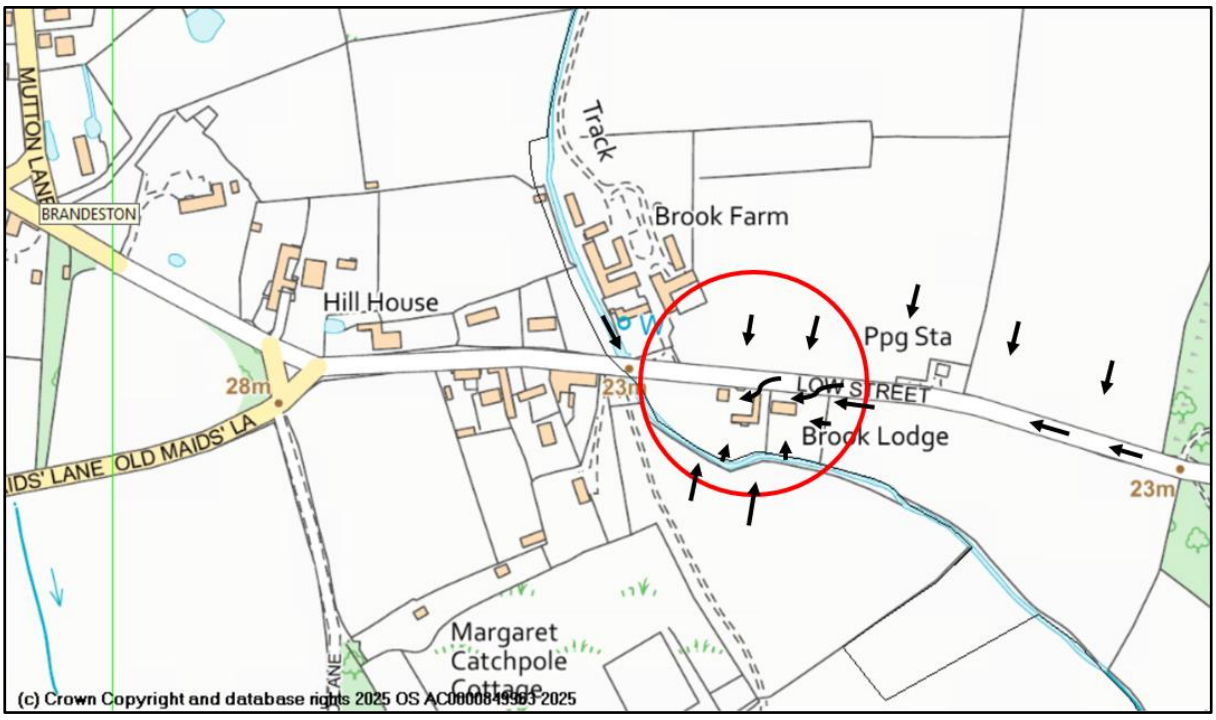

Fig. 13 Approximate floodwater flow paths, Low Street

In summary:

- Intense and prolonged rainfall exceeded the capacity of field drains and surface water flowed across fields to the north, south and east towards Low Street and towards affected property.
- Surface water on Low Street entered property from the road via lower-level driveways.
- The watercourse adjacent to affected property overtopped its banks, flooding affected property from the rear.

Recommended actions:

- Residents to install Property Flood Resilience (PFR).
- Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to “slow the flow” and attenuate water upstream on the tributaries to the watercourse.

Risk Management Authorities, Non-Risk Management Authorities and flood risk functions

Risk Management Authority	Relevant Flood Risk Function(s)
Suffolk County Council	Lead Local Flood Authority, Highways Authority & Asset Owner
Environment Agency	Lead organisation for providing flood risk management under its permissive powers and warning of flooding from main rivers
East Suffolk District Council	Local Planning Authority & Asset Owner
Anglian Water	Asset Owner
East Suffolk Water Management Board	Regulator of ordinary watercourses within the Internal Drainage District
Non-Risk Management Authority	**Relevant Flood Risk Function(s)**
Private Landowners	Riparian Responsibilities and management of water from land or/ watercourses
Private Homeowners	Improving flood resilience to property and some riparian responsibilities if adjacent to watercourses.
Parish Council	Manage flood risk at a community level, prepare and produce flood action plans and maintain watercourses where present on land they own.

Action(s) completed to date:

The following section acknowledges actions that RMA's and Non-RMAs have implemented or are currently in progress since Storm Babet and prior to publishing of this report.

Action	Responsible Party	Progress
Offer of £5k Property Flood Resilience (PFR) grant funded scheme to eligible properties that flooded during Storms Babet	Suffolk County Council Lead Local Flood Authority (LLFA)	Application window now closed. Installation of PFR measures on approved applications has been extended to December 2025.
Investigate the causes of flooding incidents during Storm Babet	Anglian Water	Investigations regarding flooding in The Street showed minor debris, roots, fat, oils and grease deposits in the sewer network which were jetted clear. A gully adjacent to the ESWMB drain, flowing

		directly to the sewage pumping station, has since been removed.
Investigate the causes of blocked highway drainage in Mill Lane	SCC Highways	In June 2024, the highways drainage system in Mill Lane was jetted and all roots, silt and debris were removed and cleared to the outfall to the River Deben.
Increase maintenance of gullies in Mill Lane if investigation demonstrates it is appropriate	SCC Highways	Cyclical maintenance increased from two yearly to annual for Mill Lane
Ensure riparian landowner responsibilities are understood with regard to watercourse management	SCC LLFA	SCC published "Flood Smart Living" handbook designed to increase flood resilience for residents, landowners and communities, November 2024

LLFA Recommended Action(s):

The following section provides a range of flood mitigation measures that could be implemented to reduce the risk of flooding in Kettleburgh. They have been derived from data and evidence collated as part of the report and have been included having been considered realistic in their implementation. The implementation of actions falls to the responsible party. Progress on the action will be monitored by Suffolk County Council but it should be acknowledged that the council has limited powers to enforce the implementation of recommended actions.

Action	Responsible Party	Timescale for response	Latest Progress Update for Actions
Short Term Actions (e.g. standard maintenance activity and initial investigation of options that can be undertaken with limited need for forward planning)			
Establish a Community Emergency Plan that includes plans to manage future flood events –Liaison with Suffolk Joint Emergency Planning Unit	Kettleburgh Parish Council	6 months	
Residents to consider installing Property Flood Resilience (PFR) measures to property to reduce damage caused by flooding.	Residents	N/A	DEFRA PFR Grant has now closed for new applications. Installation of PFR measures on approved applications has been extended to December 2025. Further information on PFR measures can be found within SCC published "Flood Smart Living" handbook. There is currently no active PFR schemes being

			managed by the LLFA in Suffolk.
Landowners to carry out watercourse maintenance, including culverts, to reduce flood risk as necessary in accordance with their riparian responsibilities.	Riparian Landowners	N/A -To be completed as and when required.	Further information on Riparian Ownership can be found within SCC published "Flood Smart Living" handbook.
Medium Term Actions (e.g. longer planning timescales and potential need to source funding but potential for greater impact)			
Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to "slow the flow" and attenuate water in the upper catchment of the watercourse on The Street. See Appendix A.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	Further information on NFM measures can be found within SCC published "Flood Smart Living" handbook.
Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to "slow the flow" and attenuate water in the upper catchment on surface water flow paths and ditches upstream in the River Deben catchment. See Appendix A.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12 - 24 months	Further information on NFM measures can be found within SCC published "Flood Smart Living" handbook.
Explore potential natural flood management measures (eg. leaky dams and attenuation ponds) to "slow the flow" and attenuate water on the surface water flow paths and associated tributary to the River Deben passing under Low Street, approximately half a mile west of Kettleburgh. See Appendix A.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12-24 months	Further information on NFM measures can be found within SCC published "Flood Smart Living" handbook.

Long Term actions (significantly longer timescale and budget required with potentially greater positive impact)			
Deliver any capital interventions that are economically, technically and environmentally feasible and acceptable to improve the flood resilience of the village, eg. NFM and PFR measures.	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	

Approval

This report will be reviewed and updated every 6 months until actions are marked as complete.

Reviewer	Date of Review

Disclaimer

This report has been prepared and published as part of Suffolk County Council's responsibilities under Section 19 of the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore while all reasonable efforts have been made to gather and verify such information 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. Should there be additional information available to develop the report, please email to floodinvestigations@suffolk.gov.uk.

The opinions, conclusions and recommendations in this Report are based on assumptions made by Suffolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Suffolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Suffolk 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 Suffolk County Council highlighting flooding to properties at a street level. Property owners and prospective purchasers or occupiers of property are advised to seek and rely on their own surveys and reports regarding any specific risk to any identified area of land.

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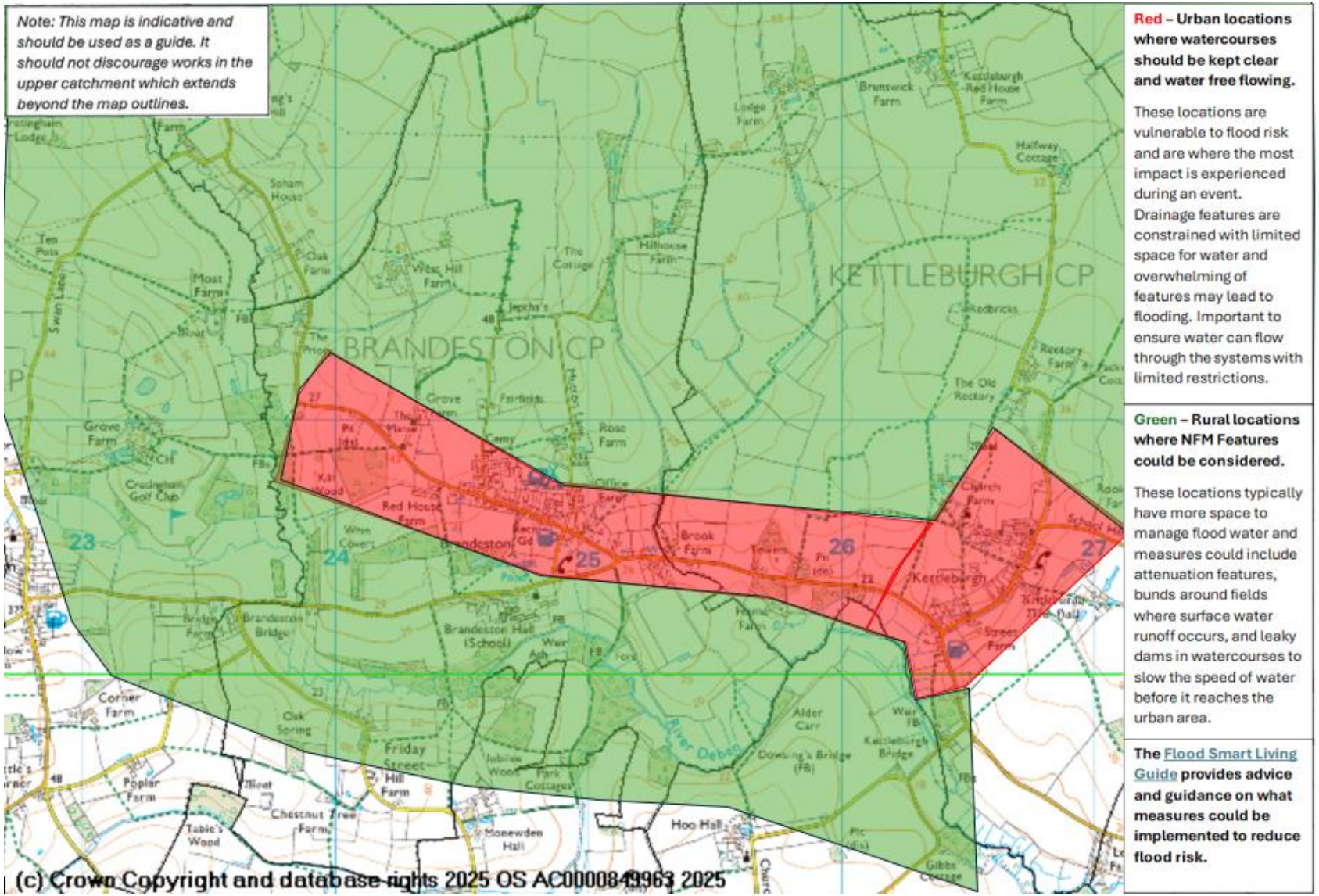
Appendix A – Indicative locations for NFM and watercourse maintenance



Red – Urban locations where watercourses should be kept clear and water free flowing.

These locations are vulnerable to flood risk and are where the most impact is experienced during an event. Drainage features are constrained with limited space for water and overwhelming of features may lead to flooding. Important to ensure water can flow through the systems with limited restrictions.

Green – Rural locations where NFM Features could be considered.

These locations typically have more space to manage flood water and measures could include attenuation features, bunds around fields where surface water runoff occurs, and leaky dams in watercourses to slow the speed of water before it reaches the urban area.

The Flood Smart Living Guide provides advice and guidance on what measures could be implemented to reduce flood risk.