RIDGE

THE STREET, HACHESTON

SURFACE WATER FLOOD RISK TECHNICAL NOTE

BALANCE POWER

05th November 2025

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SURFACE WATER FLOOD RISK TECHNICAL NOTE

BALANCE POWER

5026555-RDG-XX-XX-RP-C-0502

05th November 2025

Prepared for

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VERSION CONTROL

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P01	24/10/2025	Draft Issue for Client Review	SC	
P02	30/10/2025	Updated Draft Issue for Client Review	SC	
P03	05/11/2025	First Full Issue for Client Review	SC	JB

CONTENTS

1. INTRODUCTION

Balance Power Projects Ltd (BPP) have undertaken an extensive community consultation process, which has involved engaging with both Hacheston Parish Council and local residents on various matters about the proposed Wickham Market Battery Energy Storage System (BESS) site. Following on from consultation with the Parish Council and local residents, BPP have been made aware of a surface water flooding problem along The Street, in Hacheston. The Street is located approximately 300m downstream of the Wickham Market BESS site; The Street becomes Main Road at the junction with the access road to the Wickham Market BESS site.

Surface water flooding has previously resulted in internal property flooding to 'Garnetts Gardens' garden centre, other private residential properties along the eastern side of The Street, and the main carriageway, as a result of significant amounts of surface water draining from the large agricultural catchment area to the west. Below-ground drainage systems reportedly become overwhelmed and blocked with silt, debris etc., including a large culvert which crosses Main Road to the north of Garnetts Gardens.

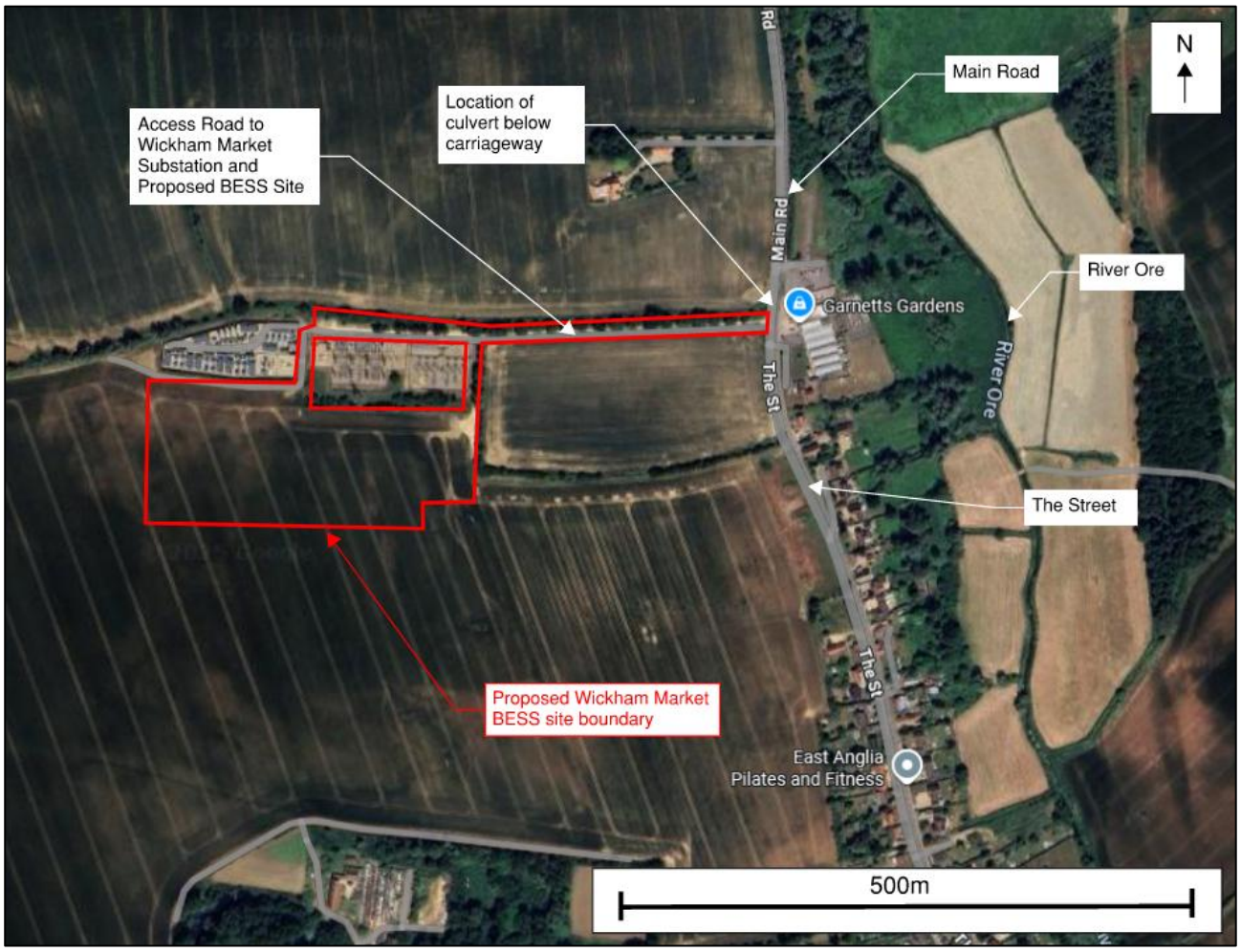


Figure 1: Site Location Plan

BPP have requested Ridge and Partners LLP to prepare a technical note to summarise the current surface water flooding problem, review available information (photos, reports, etc), identify potential mitigation measures, and set out some recommendations in terms of next steps.

1.1. Wickham Market BESS Site Drainage Strategy

A surface water drainage strategy has been developed for the Wickham Market BESS site; a layout of the proposed surface water drainage strategy is presented in Appendix A.

The existing field is fairly impervious, and the ground investigation and soakage testing (undertaken in October 2024) confirmed no/ poor infiltration as a result of the clayey ground conditions. The topsoil which overlays the clay strata is silty and shallow, which offers very little storage for surface water during rainfall events (particularly during the winter/ spring months when soil conditions are naturally wetter). As such, this results in high volumes of surface water runoff into the ditch network and access road to the north of the proposed Wickham Market BESS site.

The drainage strategy includes a series of perimeter swales, which capture the surface water runoff from the BESS compound during rainfall events. The network of perimeter swales connects into two attenuation basins, which store the surface water, and release it at a slow rate (maximum of 3 litres/ second) via a flow control chamber. A flow control chamber contains a device (for example a Hydrobrake) which only allows a limited flow to leave the chamber from the outlet pipe. The existing field (where the BESS development is to be constructed) slopes northwards towards the existing substation access road and ditch. As such, by introducing new interception features (swales and basins) on the northern perimeter of the new BESS facility, this enables more effective control of surface water draining off the field, providing space to store surface water runoff, and release it into downstream systems at a lower rate.

The greenfield (existing pre-development) peak runoff rates vs post-development peak runoff rates are summarised below:

Table 1: Comparison of existing and post-development runoff rates for Wickham Market BESS scheme

Storm Return Period	Existing (Pre-Development) Peak Runoff Rate (l/s)	Post-Development Peak Runoff Rate (l/s)
2-year	3.0	2.3
30-year	7.2	2.5
100-year	10.7	2.8
100-year + 40% climate change	N/A	3.0

The maximum post-development outflow rate of 3l/s (for the 100-year + 40% climate change storm) is equivalent to the greenfield (pre-development) runoff rate for the 1 in 2-year return period storm. This means that the scheme provides a benefit in higher return period storm events e.g. 30-year, 100-year, which reduces the strain on downstream systems. This ensures flood risk is not increased downstream as a result of the proposed Wickham Market BESS scheme, and new SuDS (sustainable drainage system) features will control runoff from the development by storing and slowing the surface water before it reaches the existing watercourse network.

1.2. Study Area

The study area for this surface water flood mitigation review has been defined based on the local watercourse network to the proposed Wickham Market BESS site, and a review of flood risk mapping and key overland surface water flow routes (this is discussed in further detail in Section 4 of this report). The study area boundary does not represent the watershed of a hydraulic catchment. It is purely an indicative area, local to

the proposed Wickham Market BESS site, where it is considered that surface water flood mitigation measures (if implemented) would have a beneficial downstream impact in terms of flood risk reduction.

The study area is presented below in Figure 2.

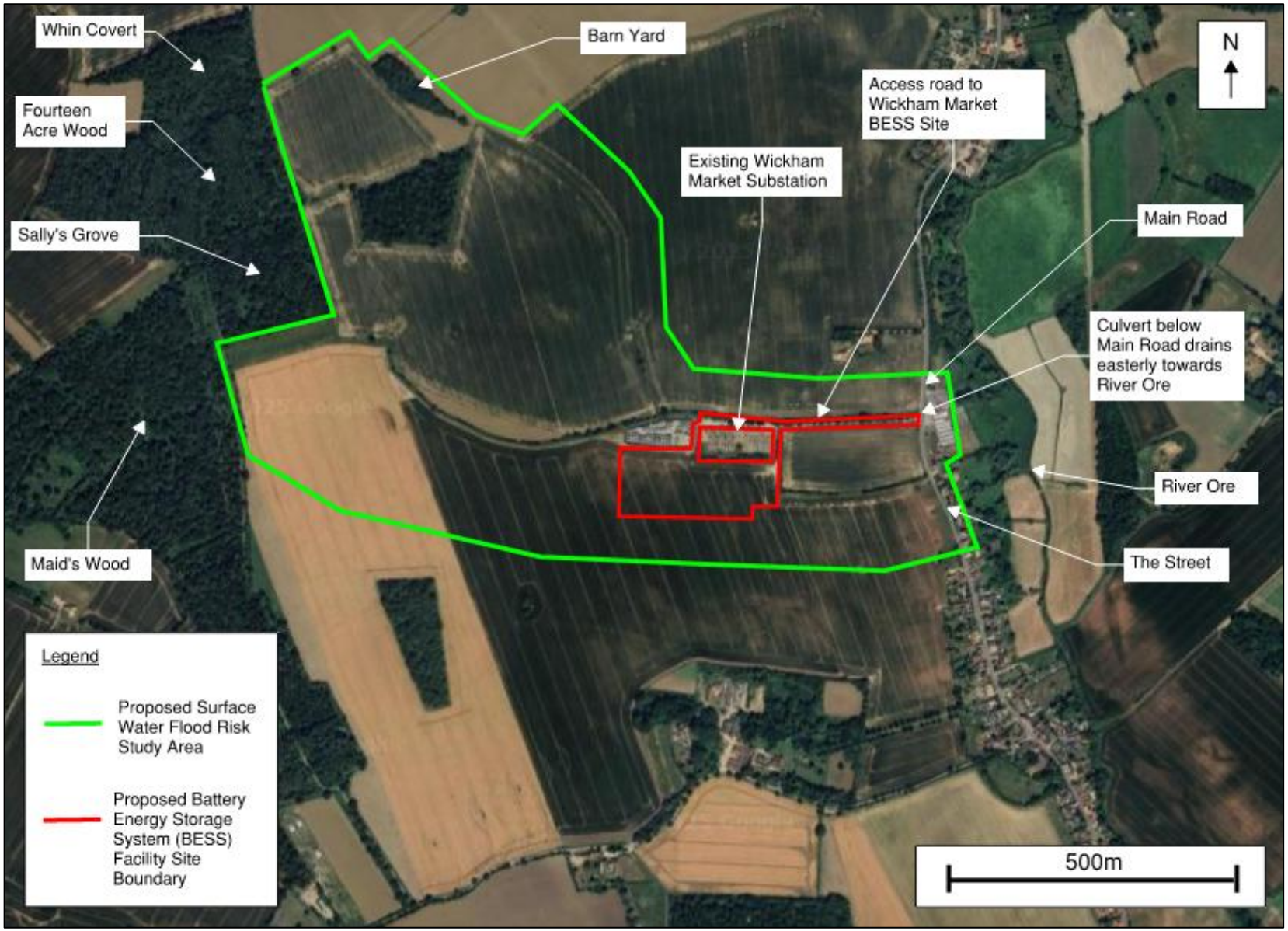


Figure 2 – Study Area for Surface Water Flood Risk Review

2. REVIEW OF EXISTING INFORMATION ON FLOODING PROBLEM

A 'Local Evidence Collection' note was prepared by Hacheston Parish Council following Storm Babet (which occurred in October 2023) and this information was shared with Suffolk County Council as the Lead Local Flood Authority. A Section 19 flood investigation report was also published by Suffolk County Council in January 2025 for the areas of Parham and Hacheston in response to Storm Babet. The 'Local Evidence Collection' note and Section 19 flood investigation report are provided in Appendix B and Appendix C respectively.

A selection of flooding photos (which pertain to the defined study area of this report downstream of the proposed Wickham Market BESS site) have been obtained from information supplied by Garnetts Gardens, Hacheston Parish Council and the Section 19 flood investigation report produced by Suffolk County Council. A selection of photos has been provided below:

Photo 1: Significant highway flooding outside Garnetts Gardens

Photo 2: Clear-out following internal flooding to Garnetts Gardens

Photo 3: Exceedance of ditch capacity upstream of highway culvert opposite Garnetts Gardens

Photo 4: Surface water overland flow across fields onto highway towards Garnetts Gardens

Photo 5: Surface water runoff from highway culvert ditch, access track, and fields onto highway towards Garnetts Gardens

Photo 6: Flooding at junction opposite Garnetts Gardens

Photo 7: Ditch overflowing upstream of highway culvert opposite Garnetts Gardens.

Photo 8: Flooding along 'The Street' approx. 250m south of Garnetts Gardens outside Thatched Cottage.

Photo 9: Bank on western side of 'The Street' opposite Thatched Cottage failure due to saturation.

Photo 10: Flooding in rear garden at Thatched Cottage

Photo 11: View towards River Ore to rear of properties along 'The Street'

3. UNDERSTANDING OF FLOODING CAUSES FROM PREVIOUS REPORTS AND INVESTIGATIONS

From a review of the available information provided by Hacheston Parish Council, the following issues have been raised as key contributing factors to the flooding problem along 'The Street':

1) Significant surface water overland flows from the agricultural farmland catchment to the west of the roadway. This results in large amounts of debris being washed onto the road, contributing to the blockages of gullies along the carriageway.

2) Previous blockages of the culvert opposite Garnetts Gardens from debris being transported within the ditch network or silt/ debris washed off the agricultural farmland catchment, with floodwater overtopping banks of the ditch locally to the culvert entry point.

3) A report of a 'dry ditch' and overland routing of surface water across fields towards properties, suggesting a lack of interception for surface water in the agricultural fields due to an inefficient ditch network.

4) Reported absence of gullies in parts of the road where surface water is unable to drain effectively.

5) Periodic fluvial (river) flooding is understood to occur in fields to the rear of properties gardens along 'The Street' from the River Ore; Low Meadows is quoted as a location which floods most years. Water levels in the River Ore and ditch network were reportedly high at the time of the internal property and highway flooding incidents; however Storm Babet was the first instance that flooding has occurred to properties from the front from overland surface water runoff from the agricultural catchment to the west of 'The Street'.

Suffolk County Council LLFA suggested the following actions for consideration in the Section 19 flood investigation report:

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM (natural flood management) projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc). west of Hacheston.
- Landowners to investigate options around installing new boundary ditches/ other surface water mitigation measures in the fields west of The Street and south of Easton Lane.
- Landowners, with support from relevant authority to investigate options to re-connect surface water flows from the west to the main River Ore.
- Landowners to carry out any watercourse / culvert maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Ensure the completion of highway drainage asset cyclic maintenance on Easton Lane and The Street.
- Investigate if there is any potential for additional highway drainage assets on Easton Lane to manage surface water flows.

Since Storm Babet in 2023, the following works/ actions have been progressed:

- The highway culvert opposite Garnetts Gardens has been dug out since Storm Babet, however it is noted that culvert needs clearing regularly to ensure the culvert is kept clear.
- Meetings with the highway authority have been arranged following Storm Babet to discuss and survey drains, however these have been cancelled or postponed.
- The need for additional gullies, remedial works to drainage systems, and a dropped kerb have been raised with the highway authority.

- Investigations into the dry ditch between Ty Brook and Malet House have taken place to identify why the ditch is not being utilised for surface water interception/ conveyance.
- Garnetts Gardens have installed a wooden board (adjacent to the ditch at the highway culvert inlet) as a means of preventing flows from spilling out of bank onto the highway when the culvert backs up.

4. FLOOD RISK MAPPING

Both the surface water and fluvial (rivers and watercourses) flood risk mapping (produced by the Environment Agency) have been reviewed against the study area. The results are illustrated below on Figures 3 and 4.

The surface water flood risk mapping illustrated in Figure 3 indicates two significant overland surface water flow routes, which follow the northern and western watercourses (ditches) shown on the plan. The northern overland flow route appears to stem from numerous, smaller flow paths which originate in the upper woodland catchment. The western overland flow route also looks to emanate from the upland woodland areas, although this flow route is less distinct in the upper catchment areas when compared against the northern flow route.

These two principal overland flow routes combine to the north of the existing Wickham Market substation, then continue in an easterly direction towards Main Road and The Street. Whilst the surface water flood risk mapping would suggest the overland flow route continues to follow the ditch network until it reaches the highway, photographic evidence, such as Photos 3 and 4 (provided in Section 2 of this report) indicate that part of this flow route is not confined to the ditch, however follows a depression in the existing agricultural field which runs parallel to the north of the ditch.

Based on the photographic evidence provided in the vicinity of Garnetts Gardens, and the surface water flooding along The Street close to this location, it appears that this surface water overland flow route, and the volumes of surface runoff being transported from the upper catchment, are a significant cause of the extensive surface water flooding in this location. An understanding of the surface water flooding mechanisms is important for identifying potential mitigation measures, which are discussed in Section 5 of this report.

The fluvial (river) flood risk mapping illustrated in Figure 4 indicates that the floodplain associated with the River Ore extends across the rear gardens of properties along The Street. Whilst internal property flooding from the River Ore may not have previously occurred, it has been reported by residents in the 'Local Evidence Collection' note that the elevated water levels observed in the River Ore, and ditches connected to the floodplain, had limited/ no capacity to receive the vast amount of surface water from the western agricultural catchment. It is likely that the elevated river levels were a contributing factor in how efficiently the highway was able to drain, exacerbating the flooding and standing water around the highway culvert (opposite Garnetts Gardens) and gullies along The Street (noting that blockages from silt and debris were also reported as clogging the storm drainage systems).

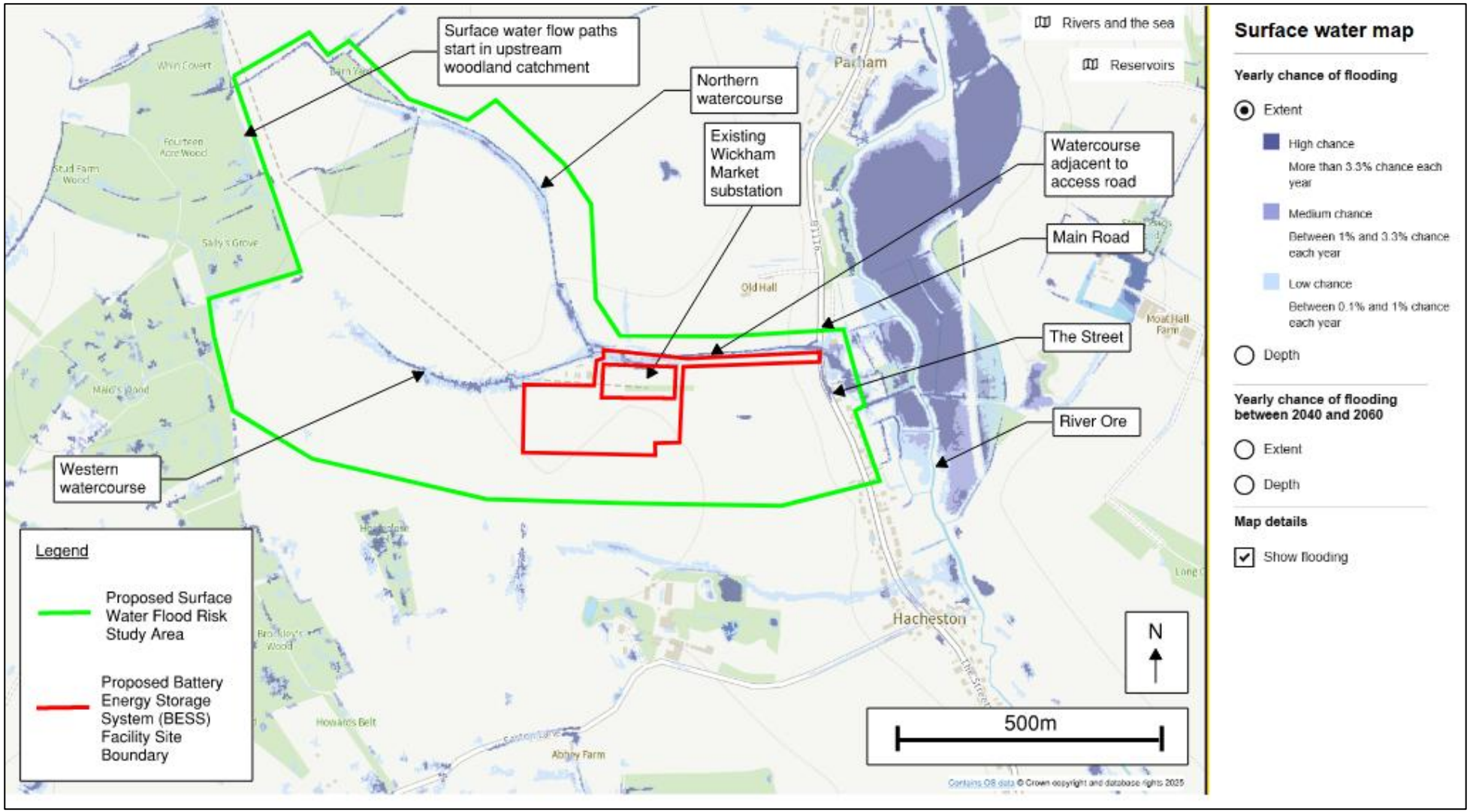


Figure 3 – Surface Water Flood Risk Mapping and Study Area

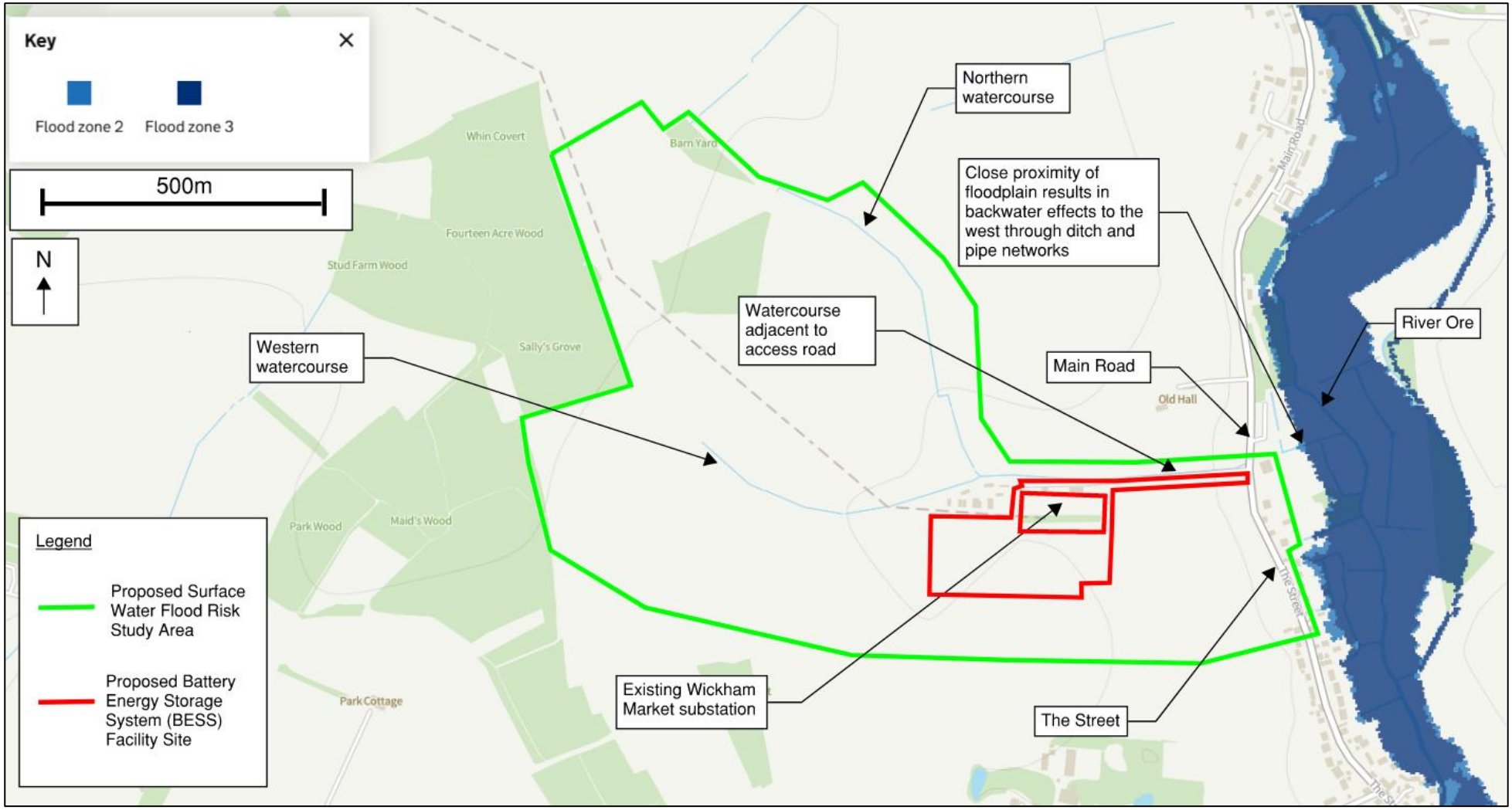


Figure 4 – Fluvial Flood Risk Mapping and Study Area

5. POTENTIAL FLOOD MITIGATION MEASURES

Whilst numerous contributing factors to the extensive surface water flooding experienced along Main Street have been identified, the most significant problem is considered to be the substantial volumes of surface water runoff draining towards properties/ the highway from the western agricultural catchment. As such, the flood mitigation measures discussed below will focus on how effectively the surface water could be attenuated (i.e. held back and released at a controlled rate) in the upstream catchment/ fields to mitigate the impact to the affected properties, Garnetts Gardens, highway and downstream surface water drainage systems.

The flood mitigation measures discussed below do not focus on any modifications to the surface water drainage collection provision along the public highway, maintenance improvements to gullies, and property level resilience (PLR) measures. However, potential solutions to limit blockages to the highway culvert opposite Garnetts Gardens have been considered, in addition to the natural flood management and surface water attenuation techniques, which are included in the recommended actions in the Section 19 flood investigation report.

5.1. Leaky/ Woody Debris Dams

There have been many successful natural flood management schemes where leaky/ woody debris dams have been installed in upper reaches of watercourses and successfully reduced flood risk downstream to properties and communities. Leaky/ woody debris dams work by holding back the water in streams/ watercourses following heavy rainfall, to restrict the rate that surface water travels downstream. By increasing the amount of time it takes for rainwater to travel downstream, the reduces the 'flashy' effect of catchments, protecting the capacity of downstream drainage systems (culverts, ditches etc) which would otherwise be overwhelmed. The leaky/ woody dam structures also collect debris through upper reaches, to reduce the risk of blockages further downstream at critical assets e.g. culvert inlets.

Photo 12: Leaky dam constructed across watercourse in Dartmoor Headwater Natural Flood Management Project (Dartmoor National Park).

The installation of leaky dams has become increasingly utilised as a means of flood risk mitigation for communities, and they are particularly suited for agricultural/ rural settings due to their non-intrusive impact, ease of construction, and use of natural materials.

Numerous case studies can be found on the successful application of leaky dams. A link to an example case study at Croft Castle, Herefordshire[1] is provided below in the footnote.

[1] https://www.herefordshire.gov.uk/media/khndk3sw/nfm_case_study_-_leaky_dams_-_croft_castle.pdf

5.2. Engineered Check Dams

As an alternative to leaky/ woody debris dams, in-channel concrete, earth, or rock/ stone pitched check dams could be considered as a means of attenuating surface water within ditches, slowing the flow significantly before it reaches downstream. These are more engineered structures than leaky/ woody debris dams, with a less naturalistic focus, typically more expensive, and more complex to construct in areas where access can be limited.

Photo 13: Concrete Checks Dams Example (Bur Oak Land Trust)

5.3. Restoration or Creation of Ditches

Restoring/ creating ditches and maintaining existing ditches in a natural state (shrubs, vegetation etc to increase roughness to slow rate of water flow) can help intercept overland surface water flow paths, and provide additional upstream storage in the watercourse network. For agricultural catchments, vegetated buffer strips can also help with intercepting surface water runoff and trap silt before this enters the watercourse.

The design of any new ditches needs to be carefully considered, as poor design and management could lead to exacerbating flood risk issues downstream, as ditches can potentially transport flows even faster to problem locations. As such, it is likely that some form of attenuation features e.g. leaky dams/ check dams would be integrated with any new ditch features should this be developed any further as a potential surface water flood mitigation option.

Photo 14: Example of farmland collection ditch with grassed buffer strip each side (FarmWildlife)

5.4. Land Reprofiling and Contour Ploughing

Where existing surface water overland flow routes follow the natural topography of the land, it may be beneficial from both a flood risk and agricultural drainage perspective to undertake land reprofiling in certain locations, with the intention of diverting excessive surface water flows to the ditch network/ attenuation locations higher up in the catchment. This would also help mitigate erosion of farmland areas and provide a greater degree of upstream surface water storage, if the overland surface water flows can instead be directed/ stored in strategic locations.

Contour ploughing could also be considered as a method for increasing attenuation and slowing of surface water flow in fields, which involves ploughing arable land along contours (as opposed to perpendicular to contours), resulting in a cascade effect of surface water flow across fields.

Photo 15: Overland surface water flow routing through arable catchment (Devon and Cornwall Land Management Project)

5.5. Shallow Earth Bunds and Basins

Another surface water attenuation technique is the construction of shallow, earth bunds/ mounds or basins across low areas in fields, or alternatively across watercourses/ ditches. These can be an effective way of holding back larger volumes of water and sediment capture compared to smaller features, such as leaky/ woody debris dams. This solution may not be suitable in some instances as it has a greater impact on agricultural land and loss of space.

Photo 16: Example of compacted earth bunds across fields (Nottinghamshire County Council)

5.6. Trash/ Debris Screen for Highway Culvert

Trash/ debris screens are an effective means of intercepting debris before it enters a hydraulic structure, such as a culvert, to reduce the risk of blockages. A trash screen should be safely accessible from above/ to the side to enable the maintenance authority to clean the screen/ clear the debris from a safe position should this be necessary.

It is presently unknown whether a trash screen or any other debris interception measures are located at the highway culvert inlet on the western side of Main Road (opposite Garnetts Gardens). It is also currently assumed the culvert is a highway authority asset and maintenance responsibility.

Photo 17: Trash screen example (CIRIA Culvert, Screen and Outfall Manual C786F)

6. NEXT STEPS

The following actions from this technical note are recommended:

- Hacheston Parish Council to discuss the potential flood mitigation measures (discussed in Section 5 above) with private landowners within the study area. Obtaining the initial buy-in from landowners with regards to exploring flood mitigation measures further (within private ownership boundaries) is critical to identify which measures are the most viable (or unviable) before any feasibility and design development is progressed.

- Hacheston Parish Council to confirm with BPP any further discussions which have taken place with Suffolk CC Lead Local Flood Authority and Highway Authority since the Section 19 flood investigation report was produced.

- Hacheston Borough Council to undertake discussions with the highway authority and riparian landowners of highway culvert inlet ditch (if not already progressed) to discuss potential blockage mitigation measures, such as a trash/ debris screen installation.

- BPP to arrange meeting with Hacheston Parish Council and other stakeholders once the above items are concluded to discuss the key outcomes/ findings. This will inform the scope of any further surface water flood mitigation works (feasibility study, outline design proposals, etc).

Subject to the outcome of the above actions, a surface water flood mitigation feasibility study (likely to include surface water hydraulic modelling) will be considered by BPP to develop the mitigation options in further detail. The surface water mitigation measure/s which are acceptable in principle to landowners must be identified in advance of this feasibility study.

APPENDIX A – WICKHAM MARKET BESS DRAINAGE STRATEGY

LEGEND

- New surface water drain and manhole
- New flow control chamber
- New surface water headwall
- Underground storage tank
- Swales and attenuation basins
- Filter drain
- Impermeable areas (concrete base)
- Impermeable areas (compacted Type 1)
- Permeable areas (gravel areas)
- Grasscrete/ground reinforcement grids

Existing 450mm or 525mm culvert

Condition of existing downstream ditches and culvert to be investigated.

Flow control chamber. Flow restricted to 3l/s for up to 100 year plus 40% climate change events. Design head 1.9m. Bypass door to be fitted. Penstock on outfall for pollution control. Locally raise cover level to minimum 29.00. Ground to be profiled to direct exceedence from chamber to outfall ditch.

Existing access track

Existing ditch invert 26.70. Outfall invert to be raised min. 150mm.

30m exclusion zone around pylons.

Outlet to be fitted with a penstock.

Empty tank for temporary storage of polluted water from battery runoff in case of fire event. 50m x 2.4m diameter shown to provide 228,000L storage. Exact size is to be confirmed.

Grasscrete/ground reinforcement grids for emergency access track.

Attenuation basin. Base level 27.80. Top level 29.00. 1:3 side slopes. Total basin area 500m². Total storage volume 400m³. Minimum 300mm freeboard for 30 year return period.

IL 27.00
IL 27.80
IL 27.20
IL 26.70
IL 26.70
IL 29.20
IL 29.45
IL 29.40
IL 28.50
IL 29.50
IL 27.80
IL 27.95
IL 29.00

Existing access track

Shallow swales to perimeter of BESS site.
1.0m Base
0.5m Depth
1:3 Slopes

Attenuation basin. Base level 27.80. Top level 29.00. 1:3 side slopes. Total basin area 765m². Total storage volume 715m³. Minimum 300mm freeboard for 30 year return period.

INDICATIVE 132kV SUBSTATION AREA - DIRECT

CONCRETE HARDSTANDING AND ROOFS AREA ≈0.37HA

COMPACTED TYPE 1 AREA ≈0.29HA

FIRE HYDRANT

BESS to be permeable gravel except for concrete hardstanding around battery storage area, substation and building foundations.

Compacted Type 1 granular access tracks.

Fire hydrants to supply water so no need for permanent water tank.

Concrete hardstanding to drain to northern swale for pollution control.

Shallow swales to perimeter of BESS site and alongside access.
1.0m Base
0.5m Depth
1:3 Slopes

Compacted Type 1 granular access tracks.

CDM REGULATIONS 2015

Significant or non-obvious risks and risks which are difficult to manage are identified on this drawing using the following symbol identified to the right with brief accompanying text. For further details of the risks identified by designers, reference should be made to CDM hazard register.

NOTES

1. The drainage has been designed to ensure there is no flooding up to and including the 100 year + 40% return period storm events.
2. Flow has restricted to a QBAR greenfield runoff rate of 3.0l/s as calculated using ICP SUDS (IH 124).
3. No flood risk based on 30 year return period based on minimum freeboard of 300mm for the pond and 150mm for the shallow perimeter swales.
4. Final sizing and design of the storage is subject to the final detailed design of the drainage system.
5. Drainage has been designed to ensure no flooding using both FSR and FEH rainfall data.
6. No consideration of groundwater levels has been made in the preparation of this preliminary drainage strategy. This would need to be reviewed and may need to be mitigated against in the detailed design of the attenuation basins and swales.
7. No consideration of infiltration options have been considered in the preparation of this preliminary drainage strategy. There is minimal infiltration at this site and soakaways are not a viable option.
8. The drainage is designed to function as a fully sealed system. The basins, filter drains and swales are to be fully lined to prevent any infiltration. Lining of the basins should be with an HDPE liner or other approved impermeable membrane to ensure the basins are fully sealed.

N

SCALE 1:500
5 0 5 10 15 20 25 m

REV	DESCRIPTION	DATE	BY	CHKD
P03	UPDATED FOLLOWING CLIENT COMMENTS	07/08/2025	JB	SC
P02	UPDATED TO NEW SITE LAYOUT	28/07/2025	JB	SC
P01	FIRST ISSUE	31/10/2024	JB	SC

ORIGINATOR: www.ridge.co.uk

RIDGE

PROJECT NUMBER: 5026555

CLIENT:
BALANCE POWER

IN ASSOCIATION WITH:

PROJECT:
WICKHAM MARKET BESS

TITLE:
PRELIMINARY DRAINAGE STRATEGY

DRAWN BY:	JB	CHECKED BY:	SC	APPROVED BY:	SC
SCALE @ A1:	1:500	DATE OF REVIEW:	31/10/2024		

ISO 19650 STATUS:
S3 - Suitable for Review and Comment

DRAWING No: 5026555-RDG-XX-XX-D-C-0500-P03 - Preliminary Drainage Strategy.dwg

PROJECT:	ORG:	FUNCTION:	SPATIAL:	FORM:	DISCIPLINE:	NUMBER:	REV:
5026555	RDG	XX	XX	D	C	0500	P03

APPENDIX B – LOCAL EVIDENCE COLLECTION

Storm Babet – Local Evidence Collection

Suffolk County Council is designated as the Lead Local Flood Authority and has a duty to collect information about the impact of flooding including undertaking investigations into “significant” flood events. For the purpose of these investigations “significant” flooding is defined as a damage to internal living space of a single dwelling flooding multiple times or when five or more properties are affected in a specific location. We are not currently able to undertake investigations for areas that do not meet these criteria or where the damage is restricted to gardens, outbuildings or a garage.

This document should be used to capture key information to summarise the impacts of Storm Babet in a community that has suffered “significant” flooding. It is designed to identify information that will be critical to the investigation, such as where the water came from (source), how it travelled through your community (pathway) and where and how locations were impacted (receptor). The information collated in this document will support the any investigation by Suffolk County Council or our partners.

We encourage you to work as a community to collect relevant information and collate it into the template below. Photographs, maps and even hand drawn diagrams can all be included within the template or just referenced and saved locally for the Flood Investigation Team to access when the investigation begins.

The document should not detail specific properties or personal details and should be comprised of factual evidence.

This form can stored locally and passed to the Flood Investigation Team when they contact the Parish Council. Any questions can be sent to: **floodinvestigations@suffolk.gov.uk**.

Or via post at:

Suffolk County Council - Flood and Water Management Team

Endeavour House, 8 Russell Road

Ipswich, Suffolk, IP1 2BX

Evidence Collection

Section 1: Parish Overview

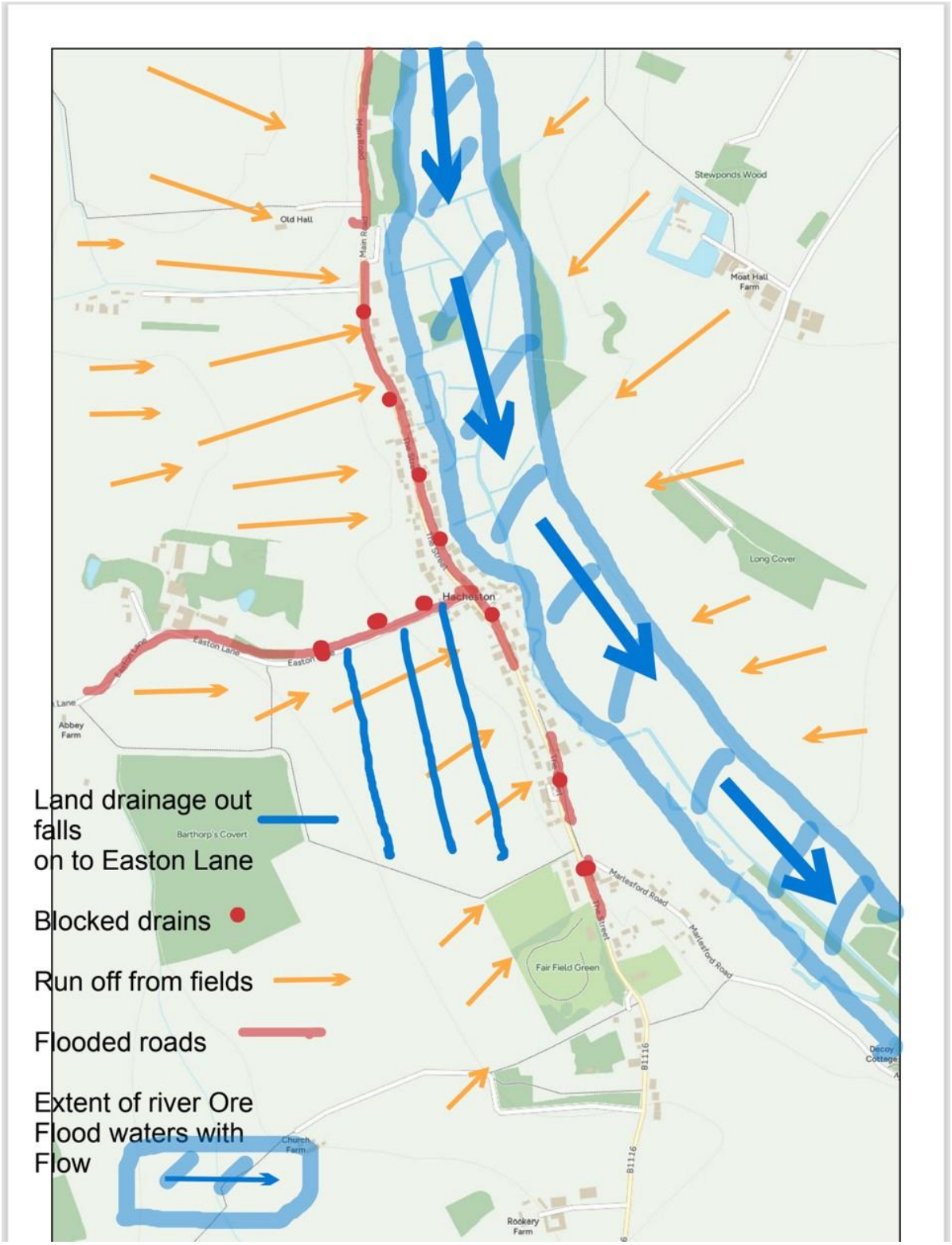
Parish name, number of properties internally flooded and details of community representative to be the contact for the investigation.

Hacheston
Up to 10 properties and maybe more were flooded internally
HPC chair James Hardy email jsh.hpc@gmail.com
HPC vice chair Lucy Lavender email lucyalavenderhacpc@gmail.com
HPC Parish Clerk Lydia Kindred email hachestonparishclerk@gmail.com

Section 2: Source

Where did the water flow from? Please provide specifics – e.g. overland flow from fields, watercourse overtopping banks, surcharging sewer system.
See overview page for guidance. Maps and Geo-referenced photos to be included (can use What3Words and it's helpful if an indication of the compass direction is also included).

In the middle part of the day of 20/10/2020 the majority of the water was from field run off to the west of the village. What minimal drainage there is, was soon overwhelmed. There are no ditches along the lower boundaries of the fields to direct water away from housing. In the later part of the day the river Ore was overwhelmed by the floodwaters from upstream.


Land drainage out falls
on to Easton Lane
Blocked drains
Run off from fields
Flooded roads
Extent of river Ore
Flood waters with Flow
Stewponds Wood
Old Hall
Main Road
Moat Hall Farm
Long Cover
Hacheston
The Street
Easton Lane
Easton
Abbey Farm
Barthorp's Covert
Marlesford Road
Fair Field Green
B1116
Church Farm
Rookery Farm
Decoy Cottage

overland flow from field opposite Thatched Cottage:

W3W:
///visitor.napped.headboard

Photo taken facing North

Photo taken facing West

W3W: ///nerve.cleanest.raves

Garden at Thatched cottage : Photo taken facing North East
///massaging.auctioned.salad

4 Low Meadows Hacheston IP13 0DQ W3W ///desire.tend.fuses

During Storm Babet our property was flooded by storm water running off the fields to the west of the B1116. I've attached photos showing the impact. The water depth closest to the property was typically 20-30 cm.

The water found its way into the ditches to the east of Low Meadows and into the River Ore but did significant damage. At the time the water levels in the ditches and river were already high so it took several days to drain away.

Low Meadows floods most years from the River Ore but this was the first time there has been flooding caused by excessive run-off from the higher ground to the west.

Photo taken facing East **///nerve.putts.spending**

Photo taken facing North East

///tripped.tragedy.reshaping

Photo taken facing North **///acted.herds.pronouns**

Photo taken facing South East **///acted.herds.pronouns**

Photo taken facing West

The Fen – Surface water ran from field opposite onto road and wake from traffic cause further flooding into property

Photo taken facing West

PC: Ty Brook: W3W: ///dressy.destroyer.memo
You can see that the water was coming mainly off the field opposite like various waterfalls along the road and down the lower laying driveways of the houses.
The drainage ditch which runs along the side of Ty Brook I believe is the only escape route for water from the road & it couldn't cope due to the ditch running into the flood plain behind Ty Brook which was already covered in water.
Fortunately the drainage route for surface water in the way that the land was shaped during the construction of Ty Brook meant that no water entered Ty Brook. All of the water coming down the driveway found its way to the drainage ditch as intended.
The following shows how the flooding from storm Babet affected the rear of Ty Brook.
The water depth at the bottom of the garden was approximately 70cm.
Fortunately, due to the slope of the garden & the flood plain beyond, the water didn't reach the house.
However it is a very good demonstration as to why that flood plain needs to remain a flood plain in the future!


Photo taken facing North


Photo taken facingNorth West

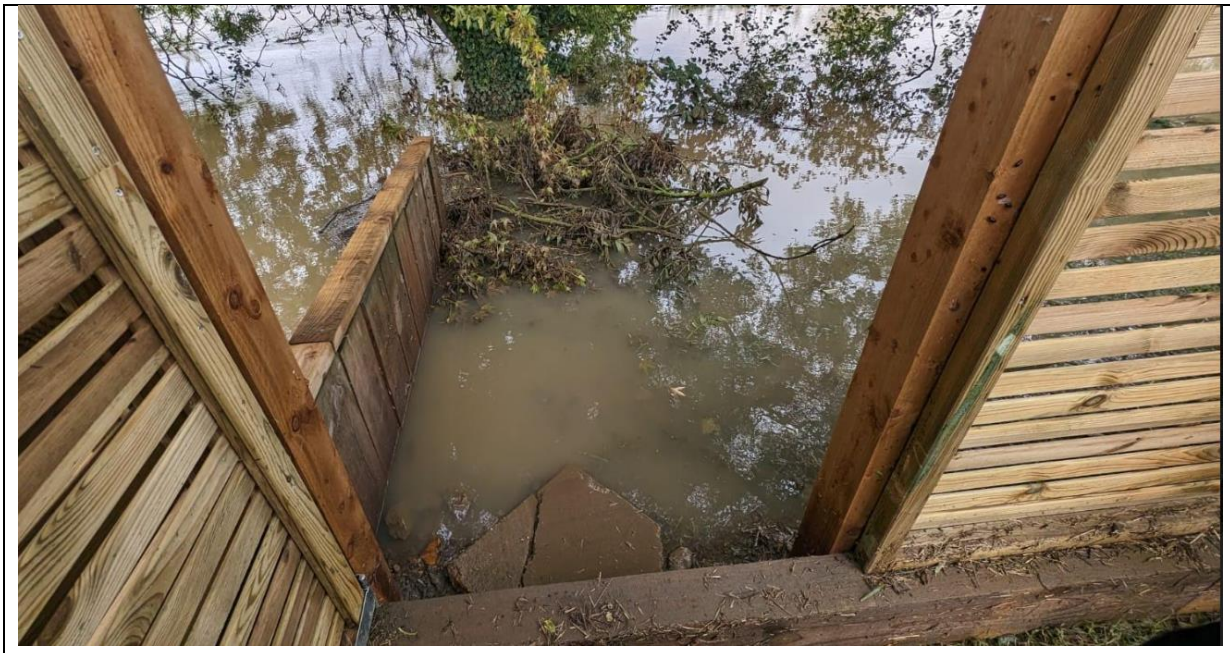
Photo taken facing East ///contact.bristle.elections

Surface water ran from field opposite down drive from substation, as drain under the road was blocked. Cars then created splashing onto properties

Photo taken facing North West ///daredevil.agreement.improving

Photo taken facing North West
///daredevil.agreement.improving

Culvert opposite Garnetts garden centre over flowing on to B1116
Photo taken facing sSouth West W3W ///various.upwardly.diamonds



Photos taken facing East ///privately.cured.nights

Photos taken facing East ///privately.cured.nights

Photo taken facing North

Easton lane - a number of drain on Easton lane get blocked from the debirs from field and the water runs down the lane onto the main road . There are some land drains from the field that run directly onto Easton lane.

Photo taken facing North West. Water pouring off road down lane between Apple Tree Cottage and The Old Forge ditches were overwhelmed

Photo taken facing East

Land drains run from fields directly into Easton Lane

Water running down Easton lane onto The street, hacheston. The water running down eatson Lane impacted a number of properties and caused the B1116 to flood .

Photo taken facing North showing wash from vehicles pushing water into properties

Water running off fields through gardens and homes to reach the road. Residents in the village attempted to slow traffic down to prevent the wake of the water running into their properties


///fuses.contemplate.oaks

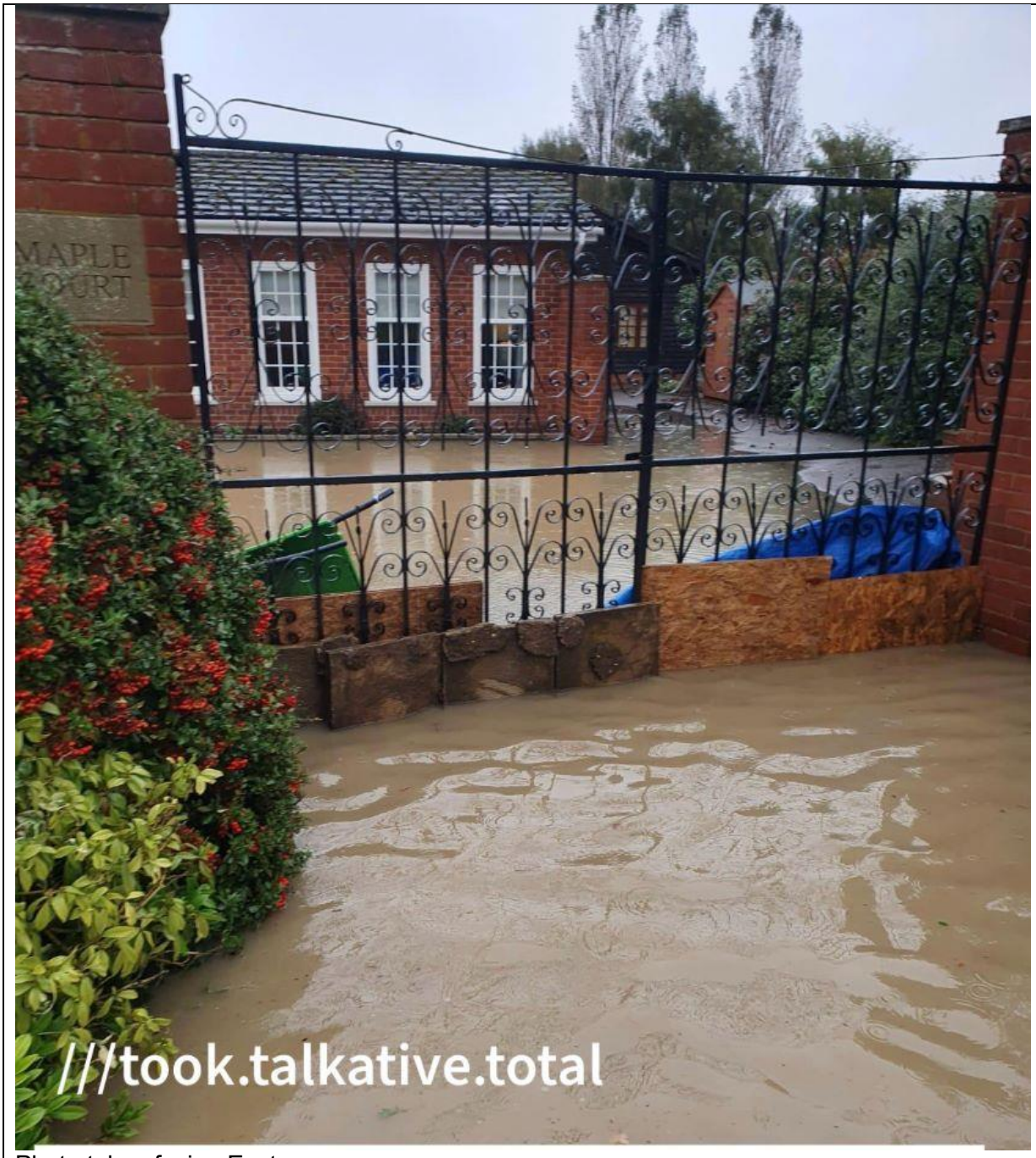


Photo taken facing East

Photo taken facing West

Water ran from road down to Wateryard and Orchard Place

Section 3: Pathway

Details to include: flow paths, timeline of events, speed of flooding onset and how long did it last.
Maps and Geo-referenced photos to be included.

Field opposite Thatched cottage, water flowing through gaps in the bank and flooding the road and then properties.
Peak of flow from fields to the west was between midday and 2pm From memory it was about 6 hours, but water remained until the next day.

Water levels in the river Ore were at previous years peak level by midday and rose by another 5-600mm until peak at about 6pm. River Ore remained well above previous peak levels for over 24 hours.

Photo taken facing North

Photo taken facing West

Water pouring off fields through property onto B1116

Photo taken facing South at about midday ///marbles.stealthier.weeded

Photo taken facing North at about 4pm from the other side of the gate
Water continued to rise another 100mm until peak at 6pm

Photo taken facing North water levels were up to 700mm deep here at 6pm

Section 4: Receptor

Details of which areas within the community were impacted, depths of water and any other information which helps explain the event.

Maps and Geo-referenced photos to be included.

Thatched cottage, 6 inches in the house, 2-3 ft in the garden.

Photo taken facing East

This photo shows water levels at about 4pm. This bridge was installed during 2020 flood waters were restricted by the deep steel beams used to support it. Water levels rose another 100mm after this photo. The height of the water flow on the south side of the bridge was 300mm lower.

Photo taken facing East from the other side of the bridge at 4pm

Section 5: Photos

Please include any photos that you feel are relevant to support the document. Photos should be Geo-referenced using What3Words and an indication of the compass direction.

Photo taken facing North East
///endearing.dart.bliss

Photo taken facing South East
///endearing.dart.bliss

Section 6: Works completed to date

Examples include maintenance to watercourses, clearing of debris, litter picks, community resilience projects, landowners investigating farming techniques or funding bids etc…

The culvert opposite Garnets garden centre was dug out but very little else has been done! This area requires clearing regularly to ensure the culvert is kept clear of debrie.

Blocked drains on Easton lane are regularly reported on the online reporting tool, but are not addressed and flooding is a regular occurance due to the surface water running down easton lane.

. Numerous meetings with highways to discuss and survey drains have been cancelled and postponed. We need remedial works to be agreed;

Request for dropped kerb to redirect water from properties.

Request for drains in the road where there are none. Regular clearing of drains to remove wash off from fields and farm machinery

Investigations into dry ditch between Ty Brook and Malet house. There are drains there but the water seems to be coming across a different part of the field and now hitting properties. Funding can be available for new ditches if required.

Guidance Notes

General

Please identify locations using what3words and avoid the use of local reference points.

The purpose of this document is to factually gather evidence. Please avoid expressing opinions about potential causes, solutions or attributing blame.

Section 1 – Parish Overview

This section is designed to capture high level information of the location and number of properties impacted. Specific properties should NOT be identified. Instead, you should list the names of affected roads and the number of properties impacted on each road. Contact details of parish lead for completing the document should be provided here.

Internal property flooding is categorised as those which have flooded within the internal habitable area of the property or internal space used by a business. Gardens, outbuildings, basements, garages, storage sheds and warehouses are excluded.

Section 2 – Source

This section is designed to capture information about the source of flooding. It should detail where the water came from and whether there were any contributing factors that may have exacerbated the flood event. Please refer to the guidance table for more information and examples.

Section 3 – Pathway

This section is designed to capture information how the water moved into the area to cause the flood. It should include a timeline of events, and if possible, specify the approximate speed of flooding onset and identify the flow paths. Please note, there may be more than one flow path that impacted your community. Please provide details for each. An annotated map can help to capture this information.

Section 4 – Receptor

This section is designed to capture information into the extent of flooding within the community, the 'WHERE'. Please detail specific locations (not individual properties, but instead roads or areas) and a summary of the impacts. If possible, please include flood depths, the time it took to subside and any relevant information that helps to explain the flood impacts.

Section 5 – Miscellaneous Photos

Please include any additional photos that may be useful evidence for the flood event. Please only include those that are relevant to support the document. We may also wish to use photographs of flooding at general public locations (not to highlight specific properties) in the report. If you do not wish us to do this please inform us of the photographs to which this applies. We encourage you to store all photographs, should the Investigation Team need them in the future.

Maps and photos are encouraged to support each section. Where possible, please ensure photos are Georeferenced to support future investigations. Please see 'How to Geo-Reference my photo' for further guidance.

Section 6 – Works completed to date

We are mindful some work may have been completed following Storm Babet to reduce the flood risk within the town. This section is designed to capture information that has been in progress or has been completed since Storm Babet in order to reduce flood risk. Examples include maintenance to watercourses, clearing of debris, litter picks, community resilience projects, landowners investigating farming techniques or funding bids.

Guidance Table

Below is some information into the sources of flooding and some things to consider which could emphasis the impacts of a flood event. Please use this as guidance when completing Section 2.

Source	Contributing Factors
Ordinary Watercourses/Ditches	- Watercourse blocked with vegetation. - Watercourse exceeded capacity (breached banks) - Assets within watercourse (i.e culvert or trash screen) blocked. - Assets within watercourse (i.e culvert) exceeded capacity - Assets within watercourse not larger enough (i.e culvert pipe too small)
Public Highway	- Highway drainage blocked (silt or vegetation) - Highway drainage exceeded capacity. - Lack of highway drainage
Sewer	- Sewer exceeded capacity (surcharging of manholes) - The water was contaminated.
Main River	- River blocked with vegetation. - River exceeded capacity (breached banks) - Assets within watercourse (i.e culvert or trash screen) blocked. - Assets within watercourse (i.e culvert) exceeded capacity. - Assets within watercourse not larger enough (i.e culvert pipe too small)
Rainfall/Overland Flow	- Water runoff from farmland - Water runoff from the highway - Water runoff from residential land (i.e gardens) - Water run off within property boundary.
Did you identify anything specific that contributed to the flooding? For example… - Tram lines within field funnelling water - Obstructions (i.e brick walls, kerbs, blockages within watercourses) - Camber of highway - Removal of vegetation speeding up run off	

How to GeoReference my photo

- **General advice and support using What3Words - https://support.what3words.com/en/**
- **How to add a What 3 Word label to a photo - https://support.what3words.com/en/articles/4498987-add-a-what3words-address-to-a-phot**

APPENDIX C – SECTION 19 FLOOD INVESTIGATION REPORT

Section 19 Flood and Water Management Act 2010

Parham & Hacheston Flood Investigation –

Storm Babet 2023

	Name	Date
Report Author	Stephen Quinn	
Responsible Officer:	Stephen Quinn	
Checked by:	Ellie Beecroft	12/11/2024
RMA Review:		19/11/2024
Approved by:	Matt Hullis	07/01/2025
Date Published		09/01/2025
Date Report Closed		

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Executive Summary

Storm Babet caused significant disruption to communities across Suffolk between 18th - 21st October 2023. Parham and Hacheston were two nearby villages that were significantly impacted, with approximately 30 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.

Parham and Hacheston are located in areas 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. The villages are low-lying, surrounded by a reasonably steep rural catchment. Multiple flood water flow paths converge near to village centres, where the gradient is noticeably shallower. The local geology and soils are characterised as having low permeability and high run off, making a high number of properties in Parham and Hacheston 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 Parham and Hacheston were widespread and for the purposes of this report, the affected areas have been categorised into six 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 Parham and Hacheston were severely impacted by flooding due to the intensity of rainfall, that 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 the villages. For short term measures, key highlights include the implementation of community flood plans, maximising Property Flood Resilience (PFR) grants, maintenance of watercourses and local Community Self Help schemes. For medium to longer term recommendations, there is emphasis on the investigation of potential improvements to drainage infrastructure, management of water from rural land and the creation of 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 Met Office weather data (Met Office, 1991-2020). This significant rainfall occurred in a short space of time and 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 measuring 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 the 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.

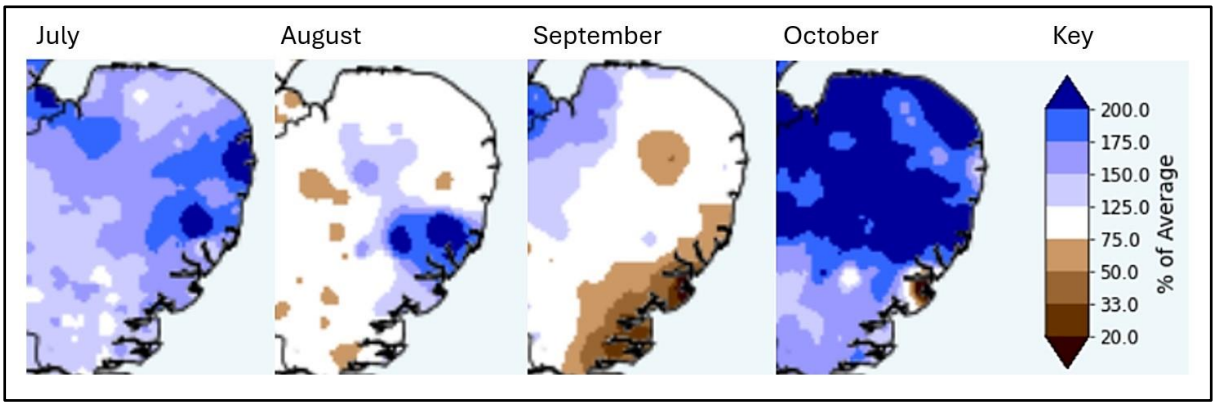

Figure 1. Average rainfall in East Anglia between July and October 2023 as a percentage of the historical average monthly rainfall

The following report acknowledges that October 2023, and in particular Storm Babet, was an extreme event and will assess the likely 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

Parham is a small village positioned halfway between the larger market towns of Framlingham and Wickham Market. Hacheston lies nearly 1 mile to the south of Parham. Both are located in the district of East Suffolk.

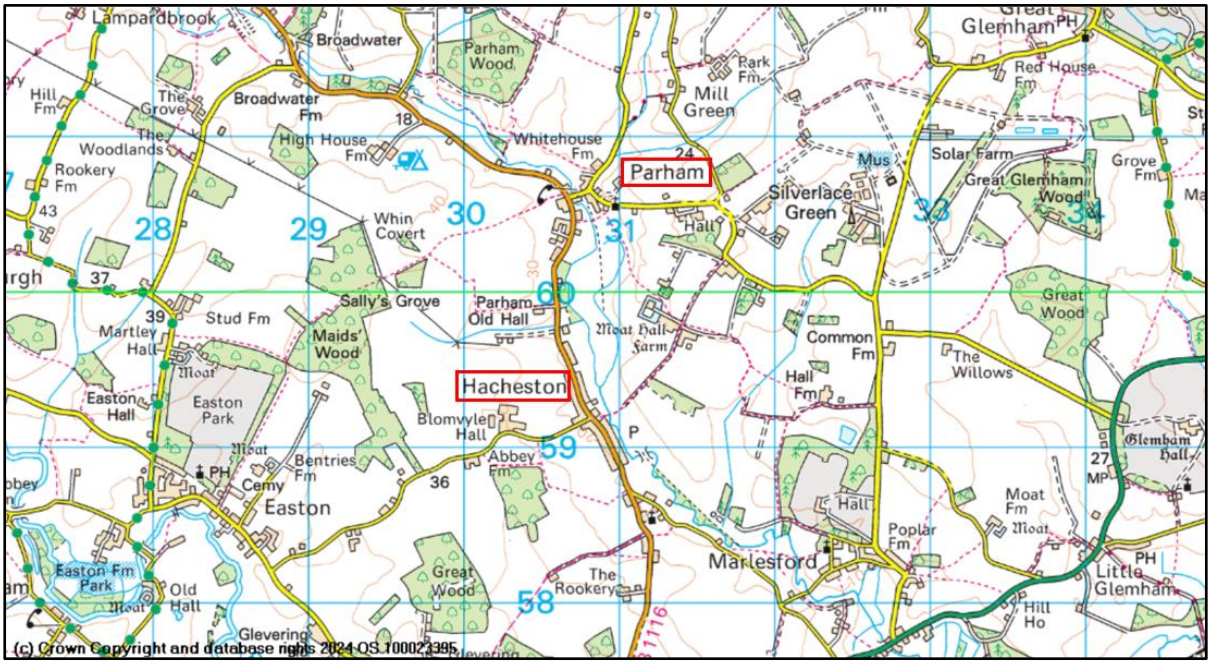

Figure 2. Investigation area map

On the 20th of October 2023, Storm Babet resulted in significant rainfall in Suffolk on top of an already wetter than average October. This caused internal flooding to properties, residential and commercial, across the county from various flooding sources. The following report is focused on Parham and Hacheston and the surrounding areas and will discuss the possible sources of the event, the observed flow paths through the communities, and the receptors which have been affected.

Parham and Hacheston were significantly impacted with approximately 30 properties reporting internal flooding. Flood water was described as coming from several sources including surface water runoff from surrounding fields and highways (pluvial), the overtopping of local watercourses (fluvial) and overwhelmed sewerage and drainage systems. Within this report, the term 'flood water' may be used to describe all types of flooding.

Figure. 3 shows the most significant watercourses in the area surrounding Parham and Hacheston, including the River Ore, a statutory main river.

The Environment Agency has permissive powers to carry out maintenance, improvement or construction work on main rivers to manage flood risk. The Internal Drainage Boards (IDBs) have similar permissive powers but instead relate to ordinary watercourses within their board area.

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.

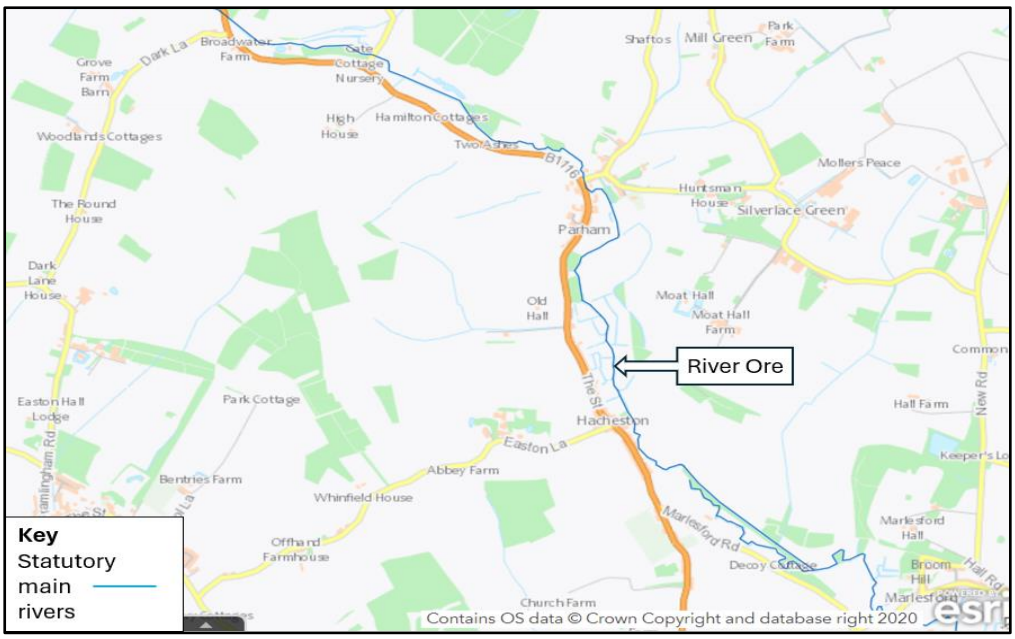

Figure 3. Location of statutory main rivers and significant ordinary watercourses

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.

Parham and Hacheston fall within the Flood Warning area: The River Ore from Framlingham to Blaxhall, including Parham, Hacheston and Marlesford.

A Flood Warning was in force from 20th October 2023 at 12:45pm until it was removed on 22nd October 2023.

Parham and Hacheston also lie within the more extensive Flood Alert area of the Thorpeness Hundred River and the River Ore. This Flood Alert was also in force on 20th October 2023.

For the purposes of this investigation the various areas affected by flooding have been separated into six distinct locations (see Figures 4 & 5). The locations are as follows:

1. Main Road B116 (northwest of Parham)
2. Hall Road
3. The Street, Brick Lane and North Green Road
4. Main Road, central Parham
5. Main Road and Corrance Close
6. Hacheston

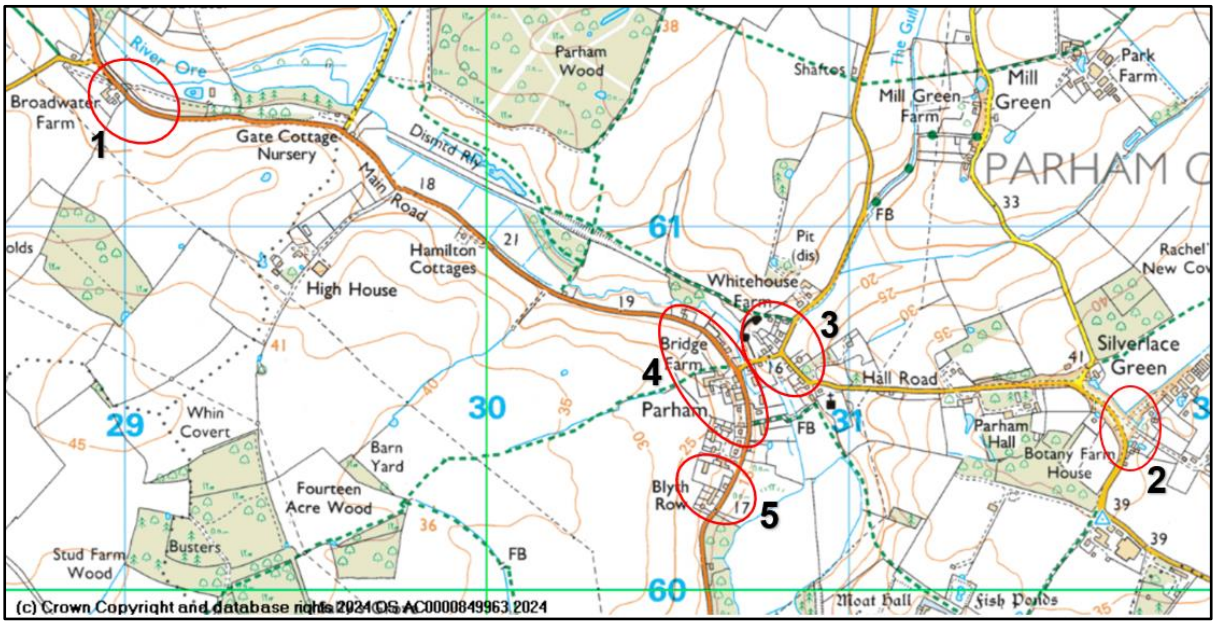

Figure 4. Parham investigation area map with locations

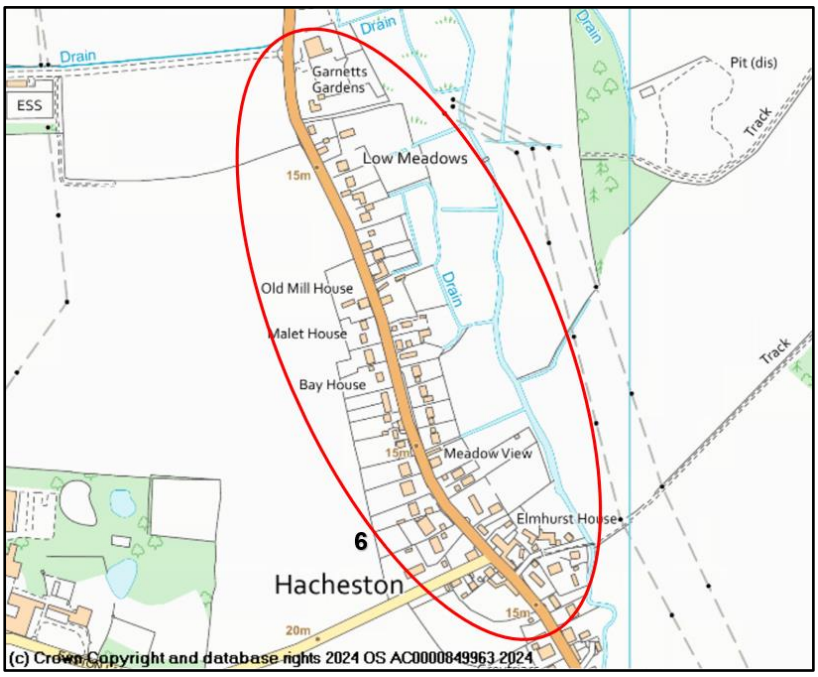

Figure 5. Hacheston investigation area map

3. Records of any historical flooding

A review of Suffolk County Council's highway reporting tool, local media reports, social media sources and Environment Agency records indicate that Parham and Hacheston have been impacted by flooding to varying extents in the past.

Suffolk County Council Highways records highlight previous flooding on The Street and Main Road Parham due to blocked highway gullies. There have been previous reports of highway flooding on North Green Road next to the culvert opposite Brick Lane.

In Hacheston there have been numerous reports of highway flooding around the Easton Lane and The Street junction area, some of which relate to issue with the roadside watercourse where the highway drainage discharges.

4. Predicted Flood Risk

Several areas of Parham and Hacheston show significant flood risk from pluvial and fluvial sources.

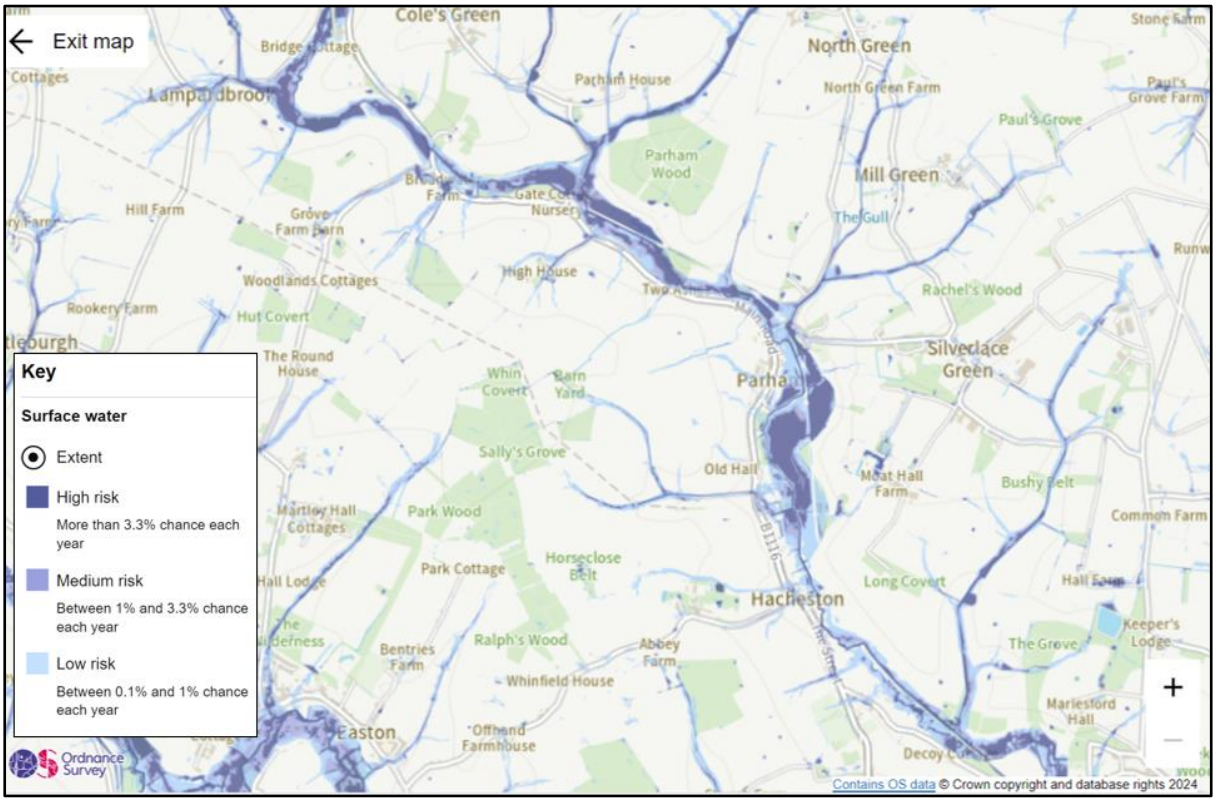

Figure 6. Predicted surface water flood risk

Figure 6 highlights the predicted pluvial (surface water run-off from surrounding land and ditches) flood risk in Parham and Hacheston, with multiple major flow paths coming into Parham from the northeast, north and west. Surface water flow paths come into Hacheston predominately from fields to the west.

There is significant predicted risk of surface water flooding on North Green Road, The Street and sections of Main Road northwest of Parham. These areas were affected by flooding during Storm Babet.

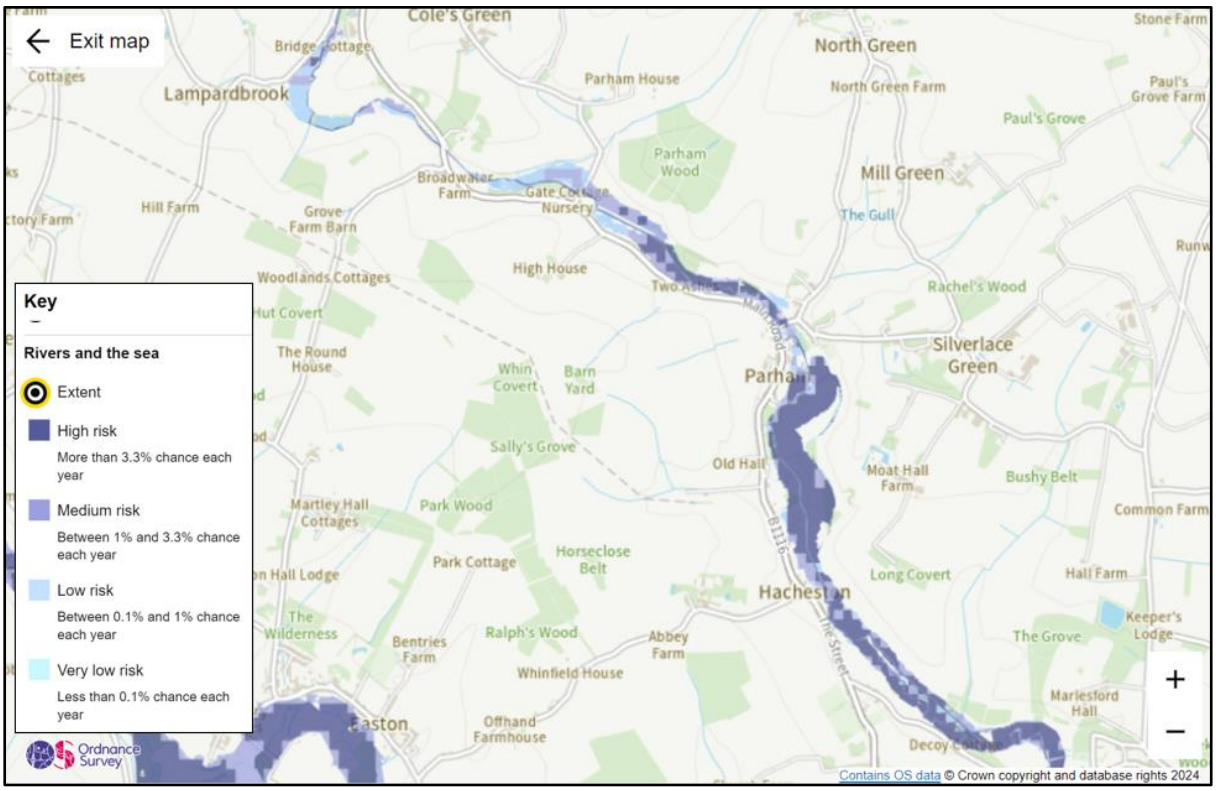

Figure 7. Predicted flood risk from rivers and sea

Figure 7 highlights the predicted fluvial (from designated main river and ordinary watercourses) flood risk in Parham and Hacheston. Fluvial flood risk in Parham and Hacheston is associated with the river Ore which passes through both villages.

In Parham, parts of Main Road and the lower end of North Green Road are predicted to be at medium to high risk of fluvial flooding. These areas were affected by flooding during Storm Babet. In Hacheston, the principal area at high risk of fluvial flooding is the fields and flood plain to the east of The Street (B1116).

5. Catchment characteristics

The villages of Parham and Hacheston are situated in a rural area dominated by arable agriculture. Parham straddles the river Ore and Hacheston is located on the west side of the river, which flows approximately northwest to southeast through the villages.

The low-lying nature of the two villages mean that during high rainfall events, considerable overland flows converge towards the villages and the river Ore. Overwhelmed drainage infrastructure and watercourses may be observed during these intense rainfall events.

Figure 8 shows the topography surrounding Parham and Hacheston with gradient changes across both. Both villages are lower than the surrounding land. The lowest points in Parham are along The Street and Main Road which are among the areas that were affected by flooding. The Street and eastern end of Easton Lane are among the lowest lying locations in Hacheston. These were identified as being some of the worst affected areas during Storm Babet.

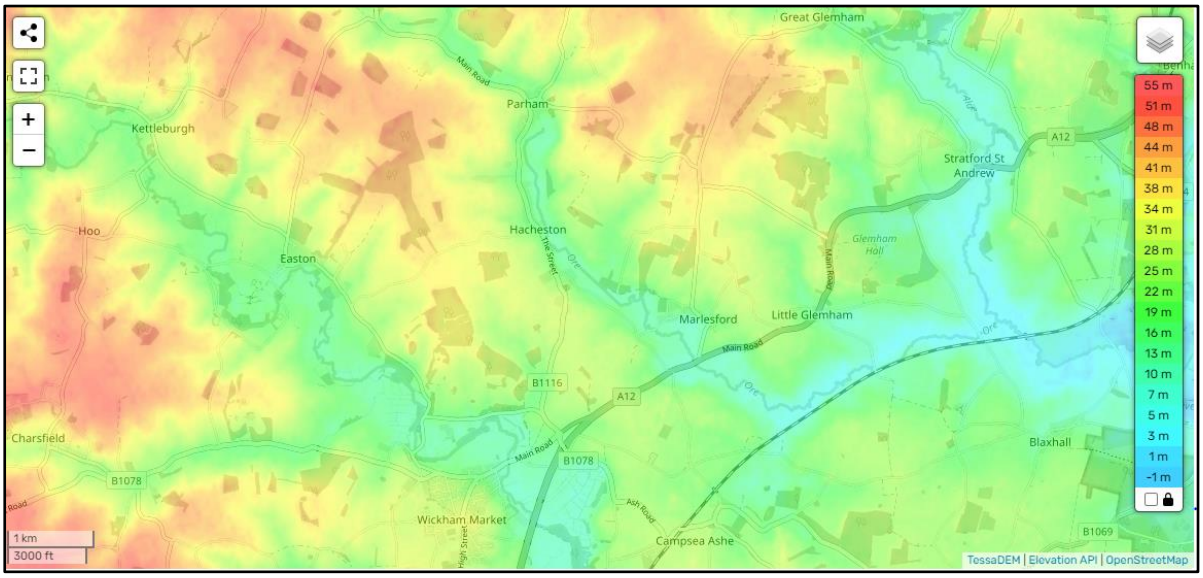

Figure 8. Parham, Hacheston and surrounding topography (TessaDEM as cited in topographic-map.com)

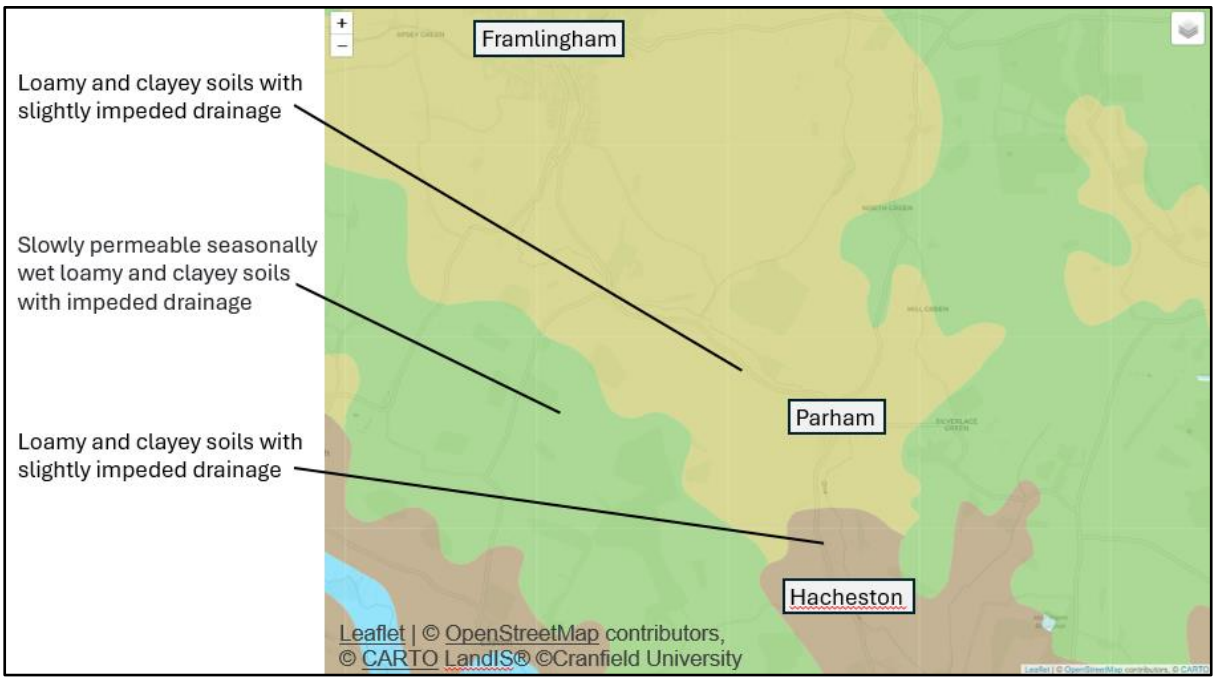

Figure 9. Soil map of catchment area (LandIS Soilscapes)

The soils surrounding Parham and Hacheston are loamy and clayey with impeded or slightly impeded drainage, meaning that water permeates more slowly and surface water runoff is greater. With regards to soils, Parham and Hacheston are situated on alluvium, mostly sand and gravels with a mixture of clay and silts. The floodplain soils surrounding the river Ore usually have naturally high groundwater and tend to be wetter.

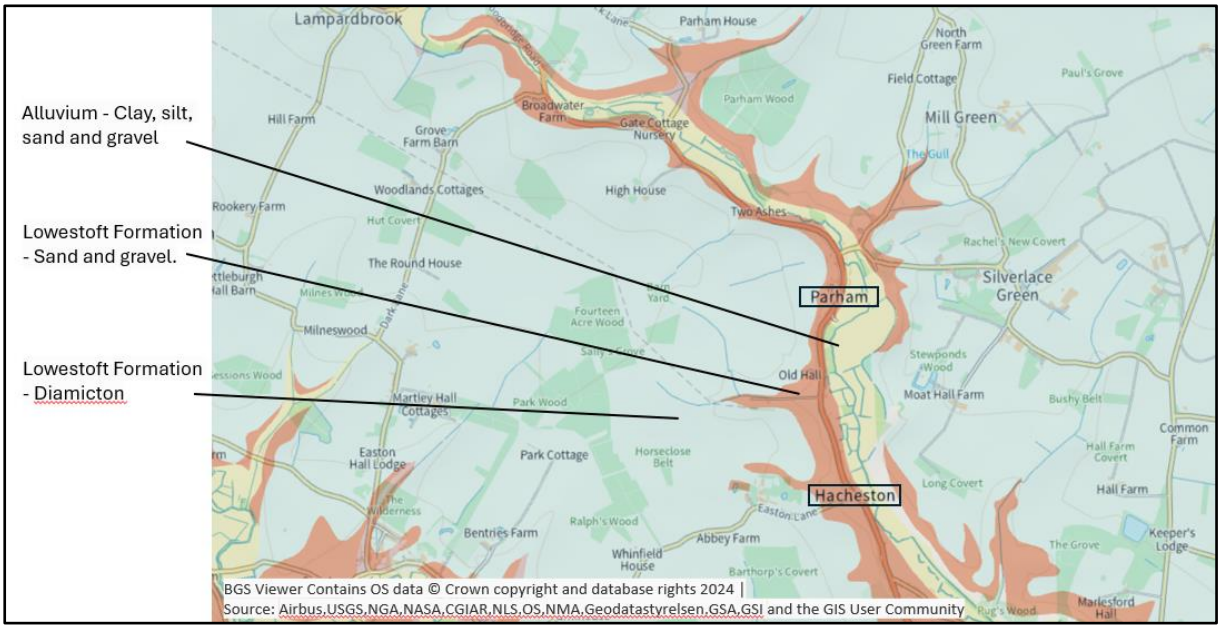

Figure 10. Superficial Geology (BGS Viewer)

Lowestoft Formation ‘Diamicton’ surrounds the villages of Parham and Hacheston 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 generally has a low permeability meaning water will tend to flow off it before it can be infiltrated, which reflects some of the reports from the Storm Babet event.

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, this makes Parham and Hacheston susceptible to extreme rainfall events and further emphasise the vulnerability of the villages to localised flooding.

Flooding Source(s), Pathway(s) & Receptor(s)

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

Storm Babet delivered significant rainfall in the Parham and Hacheston catchment between 19 and 20 October. The nearest rain gauge to Parham and Hacheston is Earl Soham. At the Earl Soham rainfall gauge there was 68.49mm of rain recorded over a period of 21hrs between 19 Oct 23:15 and 20 Oct 20:00. 35.34mm (almost half) of the rainfall was received in 3hrs between 08:30am to 11:30am 20 October.

The description of the flood events outlined below has been prepared using reports submitted to Suffolk County Council via the online Highways Reporting Tool and information gathered by Risk Management Authorities (RMAs) and the community. Detailed descriptions of each investigation area can be found in the following section.

1. Main Road B1116 (northwest of Parham)

Northwest of Parham, on Main Road, following heavy rainfall on the morning of the 20 October, internal flooding to property was caused by large amounts of surface water coming across the fields combined with overwhelmed drainage ditches. Internal flooding was reported from 10am onwards. Residents stated drainage ditches were overwhelmed by the volume of water and required maintenance. North of Main Road, the river Ore overtopped its banks and added to the spread of floodwater.

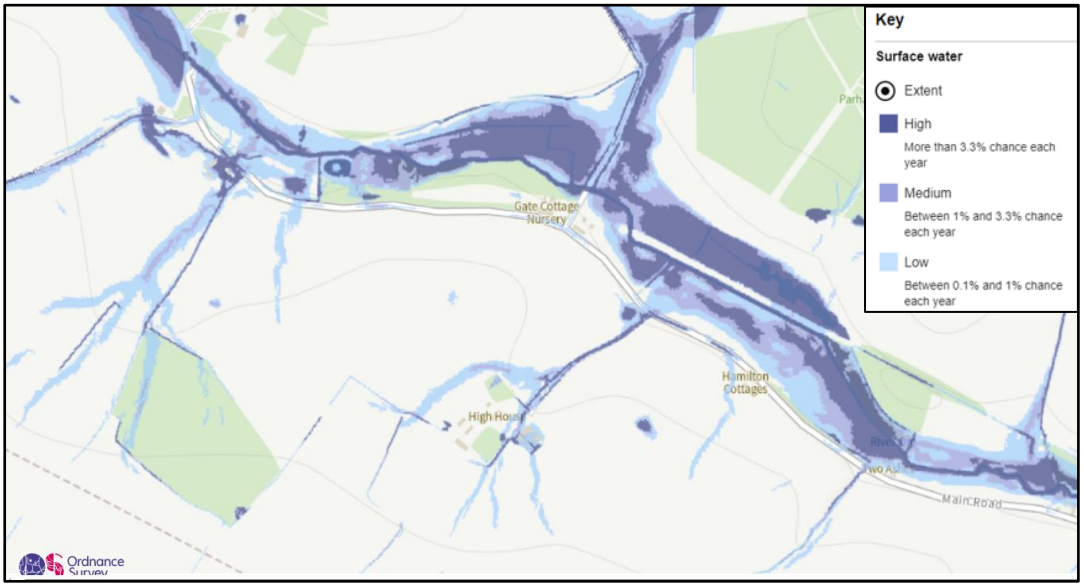

Figure 11. Surface Water flood risk on Main Road northwest of Parham

In Summary:

- Heavy rainfall on the morning of the 20 October caused large amounts of surface water to flow across the fields and drainage ditches towards properties of Main Road.
- The flooding may have been exacerbated by a lack of ditch maintenance.
- Sections of Main Road are shown to be at Medium to High risk of surface water flooding on the national predicted flood risk mapping.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) south of Main Road northwest of Parham.
- Landowners to carry out appropriate watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities.

2. Hall Road

Intense rainfall caused surface water to flow across the fields and overwhelm the ditches from the north and east towards Hall Road. Internal flooding occurred from the rear as floodwaters spread into gardens and across the carriageway.

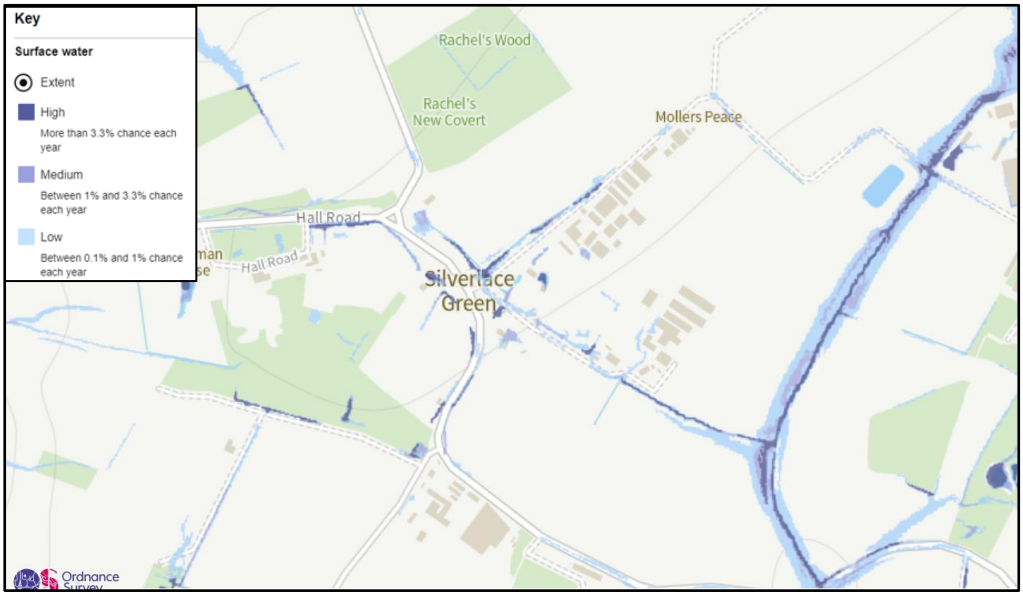

Figure 12. Surface Water flood risk on Hall Road

In Summary:

- Surface water from fields and ditches were overwhelmed causing water to enter property.
- Sections of Hall Road are at Medium to High risk of surface water flooding from the fields and ditches to the north and east.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Landowners to carry out appropriate ditch maintenance to reduce flood risk as necessary as per their riparian responsibilities.

3. The Street, Brick Lane and North Green Road

Properties on The Street were impacted by surface water flooding originating as run off from fields and ditches as well as the highways to the east and northeast along North Green Road and Hall Road. Following heavy rainfall on the morning of 20 October, the surface water was carried along these flow paths into the village (see Figure 10) exceeding the capacity of drainage features. Properties on Brick Lane were impacted as the Gull watercourse along North Green Road, overtopped and added to the floodwater already on the road (see Image 4).

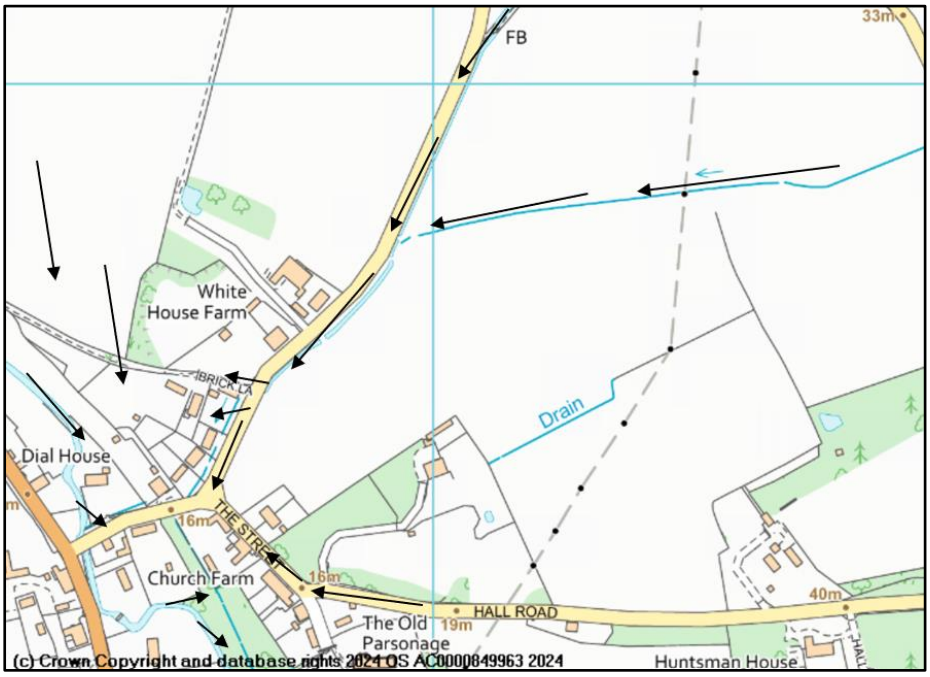

Figure 13. Approximate floodwater flow routes on The Street, Brick Lane and North Green Road

The conveyance of the floodwater in the channel was restricted by the presence of culverts and a build-up of silt immediately downstream of the road bridge opposite Brick Lane causing the floodwater to backup and overflow out of the channel. There was also a significant amount of surface water that travelled along the highway.

The surface water flows from the east and northeast then merged with the fluvial flood water coming from the overtopped river Ore at the lower end of North Green Road (see Image 1). Multiple properties reported internal flooding here as the river Ore breached the channel. The lower end of North Green Road was inundated in floodwater. The highway drainage system was completely overwhelmed with frequent

reports of gullies bubbling up and surcharging as the system could not cope with the volume of water coming into it.

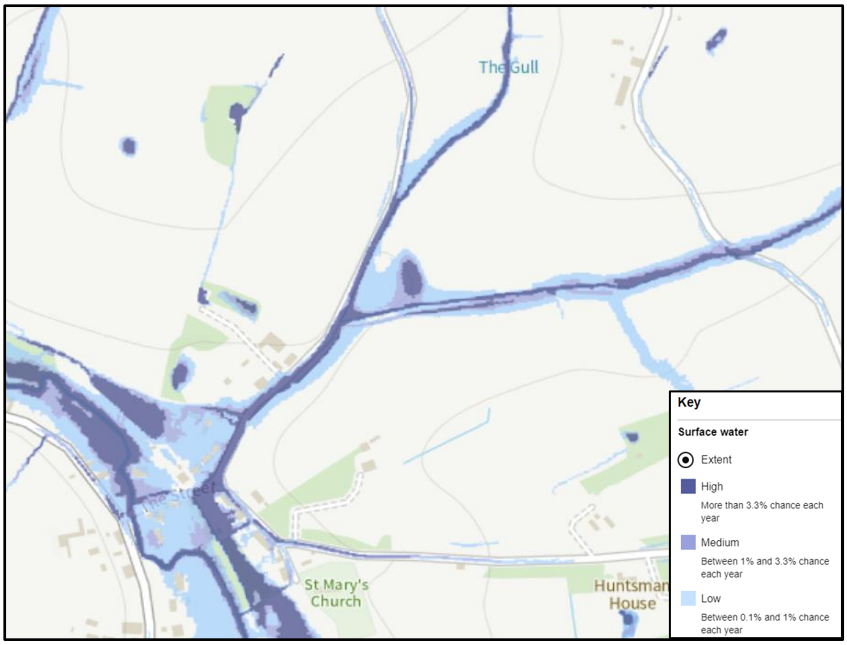

Figure 14. Surface Water flood risk on The Street, Brick Lane and North Green Road

The observed extents of the floodwater in this area correlates closely with the predicted surface water flood risk maps, with pluvial flood risk categorised as being high along sections of The Street, Brick Lane and North Green Road.

Properties on North Green Road were impacted from flood water from the road and river Ore but also from the rear. It is reported that surface water flowed off the fields to the north, under the redundant railway line, into an ordinary watercourse. It was noted that the watercourse has historically been partially infilled and during the event, flood water flowed overland into property.

In Summary:

- Surface water from fields and ditches to the east and northeast flowed along the highway and flooded properties on The Street, Brick Lane and North Green Road.
- Conveyance of the floodwater in the channel was restricted by multiple culverts and a build-up of silt downstream of the road bridge causing the floodwater to backup.
- The surface water flows merged with the fluvial flood water coming from the overtopped river Ore at the lower end of North Green Road overwhelming the highways drainage infrastructure.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.

- Investigate potential NFM projects to ‘slow the flow’ and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) northeast and east of Parham.
- Investigate realignment of the old watercourse behind properties on north green road to reinstate connection with the river Ore.
- Silt buildup immediately downstream of the road bridge on north green road to be removed by SCC Highways.
- Report any observed blockages below the road bridge on north green road on the Suffolk Highways Online Reporting Tool.
- Landowners to carry out any watercourse / culvert maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Ensure the completion of highway drainage asset cyclic maintenance on North Green Road and The Street.

4. Main Road, central Parham

The primary source of flooding in Parham was fluvial, with the Main Road being significantly impacted when flood water overtopped the banks of the river Ore. There was also surface water runoff from the east and west, caused flooding to multiple properties from the front and rear along Main Road (see Figure 15).

The overtopping of the watercourse occurred slightly north of the village and continued to breach the riverbank as it flowed through Parham. Flood water was on the highway and effectively created a second flow path along the road towards Hacheston and extended along the lower end of North Green Road toward The Street (see Image 2).

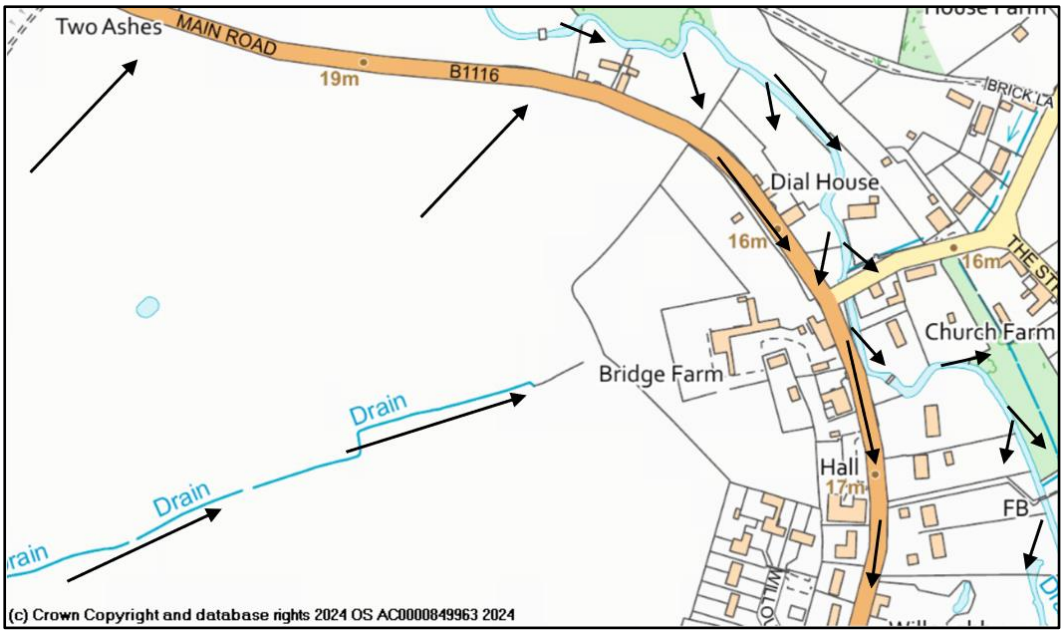

Figure 15. Approximate floodwater flow routes on Main Road, central Parham

There were reports of unmaintained or slightly obstructed sections within the river Ore. It is unlikely this significantly contributed to the flooding on the 20 October but

some localised maintenance of the channel has since occurred and flow improved through the village.

In Summary:

- Main Road in central Parham was significantly impacted by fluvial flooding from the river Ore.
- Surface water runoff from fields to the east and west contributed to the flooding.
- A large expanse of floodwater was on the highway and effectively created a second flow path along the road causing flooding to multiple properties from the front and rear.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) northeast and east of Parham.
- Landowners to carry out any watercourse / culvert maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Ensure the completion of highway drainage asset cyclic maintenance on Main Road, Parham.

5. Main Road and Corrance Close

The primary source of flooding suffered on this section of Main Road and Corrance Close was pluvial flooding from the adjacent fields to the west. Surface water flows coming across the fields flowed through and around properties from the back on the western side of Main Road and spilled onto the highway impacting Corrance Close from the front. The whole of the Corrance Close estate was described as being externally flooded by residents.

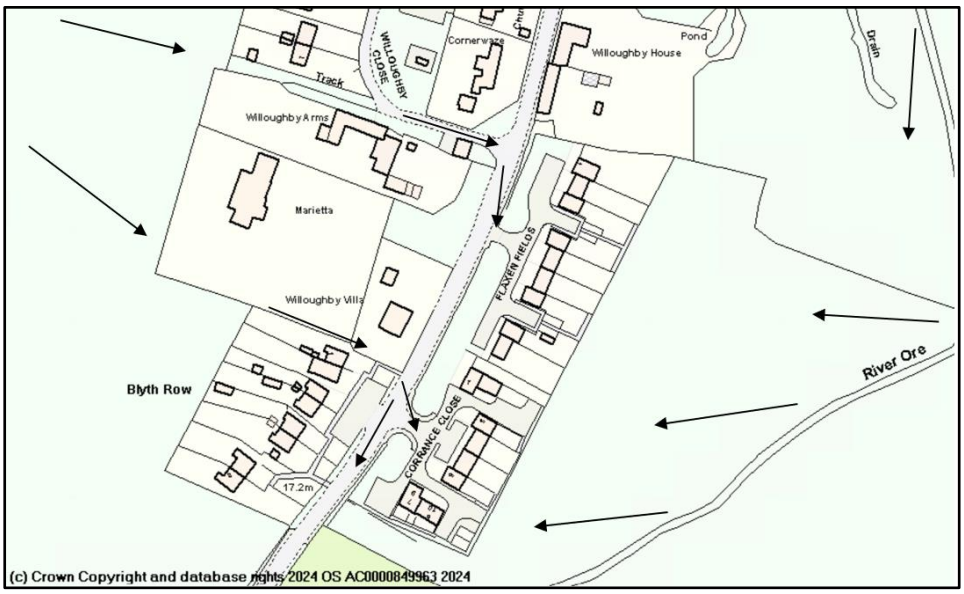

Figure 16. Approximate floodwater flow routes on Main Road and Corrance Close

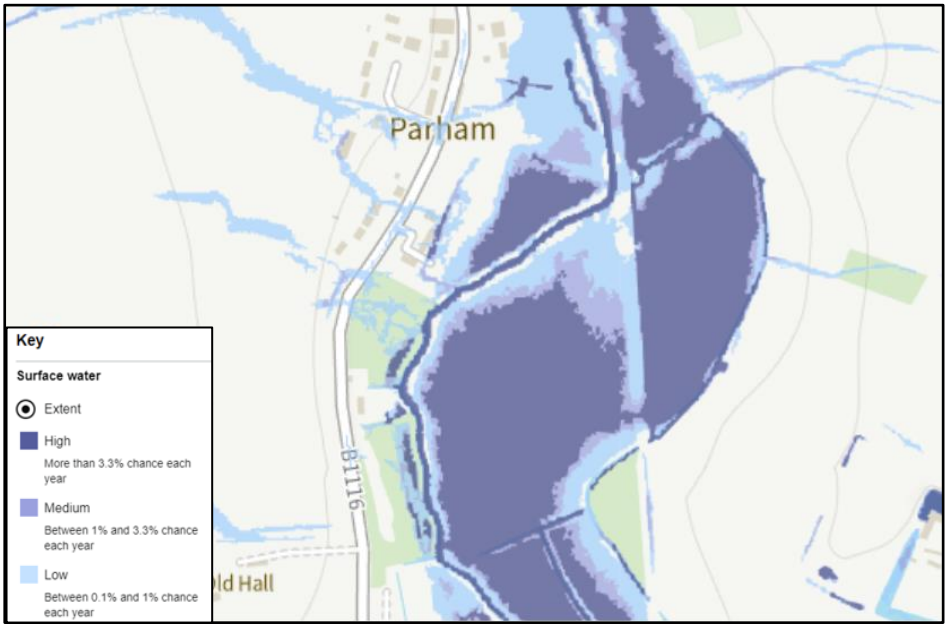

Figure 17. Surface Water flood risk on Main Road and Corrance Close

The observed floodwater flow paths and flood extents closely match the national predicted surface water flood risk mapping. Later in the day there was also fluvial flooding from the River Ore which impacted properties externally from the rear as the river levels continued to rise.

In Summary:

- Surface water flows across the fields to the west of Main Road impacted properties to the rear, flowed across and along Main Road and flooded Corrance Close from the front.
- Fluvial flooding from the River Ore impacted properties externally from the rear, as the river levels continued to rise later in the afternoon.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) west of Parham.
- LLFA & East Suffolk Local Planning Authority to investigate the flooding on Corrance Close to fully understand the source and or if any possible flooding issues weren't accounted for in the development. Landowners to carry out any watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Ensure the completion of highway drainage asset cyclic maintenance on Main Road, Parham.

6. Hacheston

Following prolonged heavy rainfall on the morning of 20 October, by midday, the majority of the floodwater impacting Hacheston was from field run off to the west of the village (see Images 5 and 6). The surface water flowed along multiple flowpaths down the gradient from the higher fields west of Hacheston, towards properties on The Street.

Floodwater flowed across fields to the west before emerging onto the carriageway, pouring through hedges and roadside verges. One of the issues reported by residents was the lack of ditches present along the lower boundaries of the fields to intercept and direct water away from housing and connect with the river behind. Many properties were flooded from the front as floodwater on the highway flowed onto driveways situated at a lower elevation and across dropped kerbs.

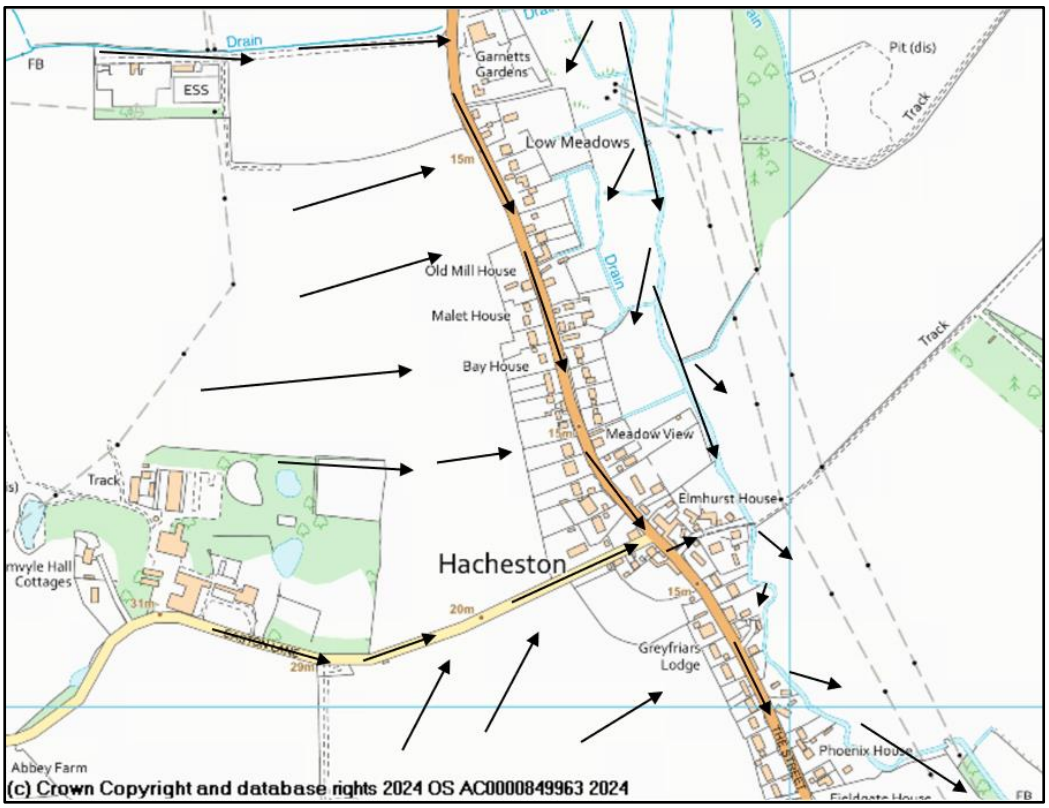

Figure 18. Approximate floodwater flow routes in Hacheston

Large extents of the carriageway on The Street were submerged by floodwater as the existing drainage assets were overwhelmed by the volumes of water flowing from the fields and roads to the west. Flooding to property was exacerbated by vehicles driving through flood water, creating a bow wave that flowed into properties.

Easton Lane acted as a significant flowpath for the runoff from the fields, carrying floodwater down toward properties at the southern end of The Street. It was reported that some land drains from the field to the south are not intercepted and instead discharge directly onto Easton Lane, contributing to the large volume of floodwater. It has also been reported that the highway drainage gullies on Easton Lane and next to the junction with The Street are frequently blocked with silt carried by the field run off, this may have contributed to the surface water pooling on the carriageway and inhibited drainage in the early stages of Storm Babet.

Later in the day, the river Ore through Hacheston exceeded its capacity as it was overwhelmed by the floodwaters from upstream. The river Ore overtopped across the surrounding fields and flowed towards gardens and the rear of properties, effectively surrounding homes in floodwater. Water levels in the Ore peaked at about 6pm. The river Ore remained well above previous peak levels for over 24 hours.

In Summary:

- The majority of the floodwater impacting Hacheston was from field run off to the west of the village.
- Floodwater flowed across the fields before emerging onto the carriageway, pouring through hedges and roadside verges.
- Many properties on the Street were flooded from the front.
- Easton Lane acted as a significant flowpath for the runoff from the fields west of The Street.
- Later in the day the river Ore overtopped its banks and flowed toward gardens and the rear of properties, surrounding homes in floodwater.

LLFA recommended action(s):

- Residents to install Property Flood Resilience (PFR) via grant funded scheme.
- Investigate potential NFM projects to 'slow the flow' and attenuate water on overland flow paths (leaky dams, restoration of watercourses, etc.) west of Hacheston.
- Landowners to investigate options around installing new boundary ditches / other surface water mitigation measures in the fields west of the Street and south of Easton Lane.
- Landowners, with support from relevant authority to investigate options to re-connect surface water flows from the west to the main river Ore.
- Landowners to carry out any watercourse / culvert maintenance to reduce flood risk as necessary as per their riparian responsibilities.
- Ensure the completion of highway drainage asset cyclic maintenance on Easton Lane and The Street.
- Investigate if there is any potential for additional highway drainage assets on Easton Lane to manage surface water flows.

Images of Flooding

Photos included in the report have been submitted via a range of sources, including customer reports, community information and by Risk Management Authorities. The use of photos has been included in good faith to support the investigation and provide further context of the flood event.

Image 1. Lower end of North Green Road

Image 2. Central Parham

Image 3. Parham highway flooding

Image 4. Highway flooding outside Brick Lane

Image 5. Surface water flows from fields west of Hacheston

Image 6. Surface water runoff opposite Garnett's Garden Centre, Hacheston

Risk Management Authorities, Non Risk Management Authority and flood risk function(s)

The following section acknowledges both RMA's and Non-RMA's relevant to the location and provide an overview of their flood risk functions. The table has been compiled from information collated as part of the investigation. It is not exhaustive and it should be acknowledged additional organisations and groups may be active within the community.

Risk Management Authority	**Relevant Flood Risk Function(s)**
Suffolk County Council	Lead local Flood Authority (LLFA), Highways Authority & Asset Owner
The Environment Agency (EA)	Lead organisation for providing flood risk management under its permissive powers and issuing warnings of flooding from main river
Anglian Water	Asset Owner
Internal Drainage Board (IDB) East Suffolk Water Management Board	Supervising land drainage and flood defence works on ordinary watercourses
East Suffolk District Council	Local Planning Authority (LPA) & Asset Owner
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.
Parham and Hacheston Parish Councils	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 prior to publication:

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	Risk Management Authority	Progress
Offer of Property Flood Resilience (PFR) measures to the properties that flooded during Storms Babet	Suffolk County Council Lead Local Flood Authority	Ongoing
Highway gullies throughout Parham and Hacheston were inspected and cleansed in November 2024. Further gully cleansing is programmed for March 2025.	Suffolk County Council Highways Authority	Complete and ongoing.
Project to relocate the dropped kerb outside flooded property, Hacheston	Suffolk County Council Highways Authority	Complete. Working with landowners, works have been completed to relocate dropped kerbs further north and create an exceedance path towards a watercourse, directing water away from property.
Following a thorough review of the coverage of our Flood Warning Service, and learning from the impacts of Storm Babet, we have made changes to the spatial extent of our Flood Warning and Flood Alert Areas.	Environment Agency (EA)	We have expanded the area covered by our Flood Warning Service in the Ore catchment, to ensure that all properties which were reported as impacted during Storm Babet from main river sources are now within the area extents. Many more customers can now sign up to receive Flood Alerts and Flood Warnings.
Engagement with riparian landowner on removal of a tree causing a blockage in the watercourse.	Environment Agency (EA)	Ongoing
EA information letters have been sent to main river riparian landowners	Environment Agency (EA)	Complete

in Parham and Hacheston.		
Identification of several possible NFM opportunities upstream of Parham and Hacheston.	Community and local landowners	Ongoing
Ensure riparian landowner responsibilities are understood with regard to watercourse management.	SCC LLFA	SCC published "Flood Smart Living" online and hard copy guide to increasing flood resilience for residents, landowners and communities, December 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 Parham and Hacheston. 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 (June 2025)
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	Parham & Hacheston Parish Councils	6 months	**Ongoing**. Parham Parish Council has agreed to create an Emergency Plan and will liaise with JEPU in this regard. **Ongoing**. Hacheston Parish Council have agreed to make a community emergency plan.
Maximise the take up of the £5k PFR Grant currently available to residents before the April 2025 deadline	Residents / SCC LLFA	4 months	**Complete** 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

Understand the annual event probability of the rainfall & river flow across the region	EA	6 months	**Complete** The Environment Agency have completed a piece of work which looked to establish the annual probability of Storm Babet and Storm Ciaran. This short report summarises the findings of a hydrological study which looked at the context, magnitude and rarity of the rainfall and river flows during these two events. You can read this information in the Autumn 2023 East Anglian Flood Hydrology Investigation Report.
Ensure the completion of highway drainage asset cyclic maintenance across Parham. Key areas include The Street, North Green Road and Main Road	SCC Highways Authority	Annually	Ongoing. Routine cleansing of the gullies will be completed in line with the set cycles (annual or biennial). **The Street** Works are programmed for July 2025 to clear the ditch south of Church Farm, addressing silt buildup that has partially buried the existing outfall pipe. The associated culvert is also scheduled for clearance. All other assets within this network were confirmed operational during the last visit in March 2025 **North Green Road** No recorded issues currently exist within the network. Routine biennial cleansing of all gullies was completed in November 2024. **Main Road** Jetting operations were concluded on five assets that

			were previously non-operational in May 2025. The defects preventing their functionality have been resolved, resulting in the network now being fully operational.
Ensure the completion of highway drainage asset cyclic maintenance across Hacheston. Key areas include The Street and Easton Lane	SCC Highways Authority	Annually	**Ongoing**: Routine cleansing of the gullies will be completed in line with the set cycles (annual or biennial). **The Street** Following jetting works; most of the drainage network is clear. However, two issues persist: concrete debris in gully 60071317 is reducing its capacity, and a structural defect 18.2m downstream of gully 60071354's pipe channel affects upstream gully 60071353. Further investigation and repairs are being organised to fully restore network functionality. **Easton Lane** Following jetting in May 2025, a previously slow-running gully near Whitefield House, whose outfall was buried in the adjacent ditch, is now fully operational, with no further issues within the network.
Utilise the Community Self Help scheme to undertake minor maintenance activities and deployment of flood warning signs	Parish Councils / SCC Highways Authority	6 -12 months	**Complete:** Update from Parham Parish Council: The Parish Council already considered joining this scheme but decided not Update from Hacheston Parish Council: The Parish Council have signed up to the Community Self-help

			Scheme and hope to get a volunteer on the required training later this Summer
Riparian Owners to carry out roadside ditch and or watercourse maintenance to reduce flood risk as necessary as per their riparian responsibilities	Landowners/Residents	6 - 12 months	**Complete:** SCC published "Flood Smart Living" online and hard copy guide to increasing flood resilience for residents, landowners and communities, December 2024 Update from Parham Parish Council: We have been helping to advise residents of their riparian responsibilities and are pleased to report that the response has been good – several residents have been maintaining their trees and clearing vegetation from near watercourses adjacent to their properties.
Report any observed blockages below the road bridges over the river and watercourses on the Suffolk Highways Online Reporting Tool	Landowners, EA, IDB, SCC Highways	N/A	**Update from the Environment Agency:** Report to EA of fallen tree in Parham, engaged with landowner and has now been removed. Report of material being deposited on floodplain in Hacheston, site **Update from Suffolk Highways:** The Main Road culvert was investigated and confirmed to be clear, with no flow obstructions.
Medium Term Actions (e.g. longer planning timescales and potential need to source funding but potential for greater impact)			
Explore potential NFM projects to 'slow the flow' and attenuate water on overland flow paths affecting The Street, North Green Road, Main Road (Parham), Easton Lane and The Street (Hacheston). E.g. leaky dams, woody debris	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA, IDB)	12 - 24 months	**Ongoing:** Parham Parish Council have been successful in securing funding though the East Anglia NFM Local Levy Approach. The funding will support the delivery of three new features designed to 'slow the flow' and mitigate flooding in Parham.

installation, restoration of watercourses			
LLFA & LPA to investigate the flooding on Corrance Close to fully understand the source and or if any possible flooding issues weren't accounted for in the development.	East Suffolk District Council Local Planning Authority, SCC LLFA	12 - 24 months	No updated expected as yet
Remove the buildup of silt at the downstream end of the road bridge over the Gull watercourse on north green road	SCC Highways Authority	12 - 24 months	**Ongoing –** There is a project that is currently being designed to repair the retaining wall that supports the edge of the highway at the downstream end of the culvert - as part of these works we also plan to undertake some localised clearance of silt alongside the retaining wall.
Explore potential NFM measures which aim to attenuate water in the upper catchments e.g. storage ponds, wetland areas	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA, IDB)	12 - 24 months	**Ongoing:** Parham Parish Council have been successful in securing funding though the East Anglia NFM Local Levy Approach. The funding will support the delivery of three new features designed to 'slow the flow' and mitigate flooding in Parham.
Investigate opportunities to update development plan policy in Neighbourhood Plans or any potential Joint Local Plan site allocation(s) which identify risks and opportunities to mitigate flood risk issues as development comes forward	East Suffolk District Council Local Planning Authority, SCC LLFA	12 months+	Update from East Suffolk District Council Local Planning Authority - We are not aware of any Neighbourhood Plan activity in Parham or Hacheston. Work on a new East Suffolk Local Plan is anticipated to begin in 2025 with adoption by 2029.

Investigate options to re-connect surface water flows from the fields west of Hacheston to the main river Ore	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	12 - 24 months	No updated expected as yet
Investigate if there is any potential for additional highway drainage assets on Easton Lane to manage surface water flows.	SCC Highways Authority	12 - 24 months	No updated expected as yet
Long Term actions (significantly longer timescale and budget required with potentially greater positive impact)			
Deliver improvements to highway drainage network to manage surface water flows if investigation works suggest it is beneficial and viable	SCC Highways Authority	TBC	No updated expected as yet
Installation of NFM features within upper catchments to attenuate and slow flood water if investigation works suggest it is viable	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	No updated expected as yet
Deliver any capital interventions that are economically, technically and environmentally feasible and acceptable to improve flood resilience	Landowners, supported by relevant authority, resource dependant (SCC LLFA, EA)	TBC	No updated expected as yet

Approval

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

Reviewer	Date of Review
Ellie Coleby	31/07/2025

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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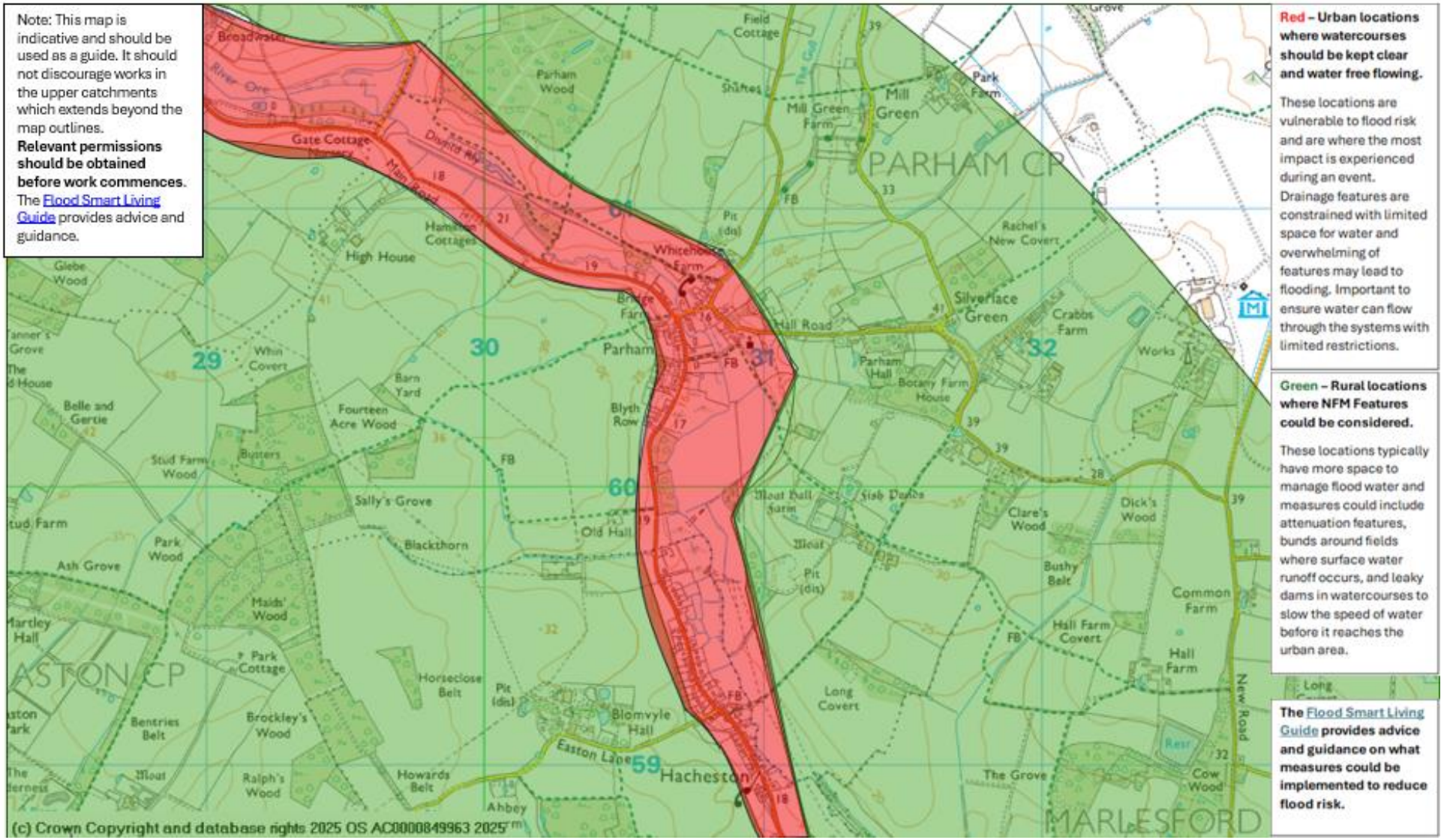
Appendix A – Indicative locations for NFM and watercourse



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