

Essex County Council Flood Investigation Report

Helions Bumpstead

Rev	Date	Details	Author	Checked and Approved By
01	January 2022	Draft report for stakeholder consultation	Charlotte Palmer Flood Investigation Engineer	Lucy Shepherd Lead Local Flood Authority Manager
02	February 2022	Final revisions based on consultation response	David Uncle Flood Investigation Engineer	Lucy Shepherd Lead Local Flood Authority Manager
03	March 2022	Revisions following Parish Council feedback	David Uncle Flood Investigation Engineer	Lucy Shepherd Lead Local Flood Authority Manager

Introduction

Purpose and Requirements of the Flood Investigation Report

Essex County Council as the Lead Local Flood Authority (LLFA) has a responsibility to record and report flood incidents as detailed within Section 19 of the Flood and Water Management Act (FWMA) 2010:

Section 19

(1) On becoming aware of a flood in its areas, 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.

Essex County Council has established criteria for Section 19 Flood Investigation Reports as follows:

- The internal flooding* of a property on more than one occasion
- OR**
- The internal flooding* of five or more properties in a single event

AND

- An ambiguity surrounding the source or responsibility of a flood incident.

*Internal flooding does not include the flooding of gardens and garages; only properties where internal flooding is above threshold level.

Site Information

Site Location and Flood Risk Helions Bumpstead (Grid Ref: 565037, 241603)

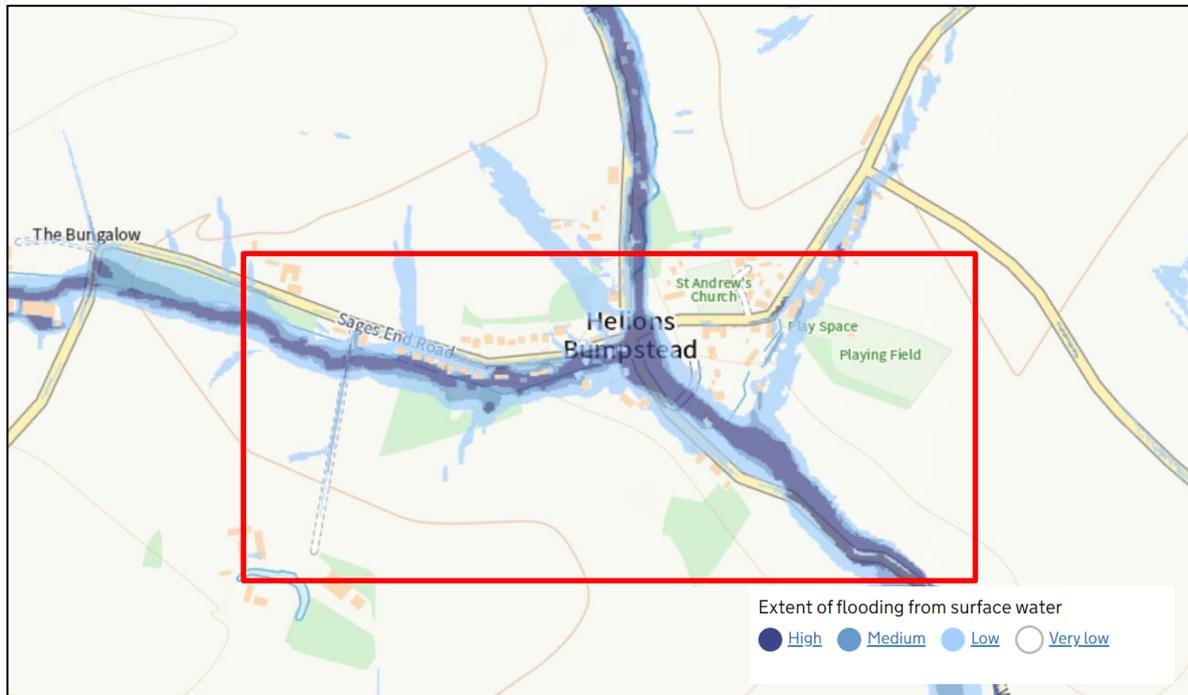


Figure 1 – Flood Investigation Area shown in red and Risk of Flooding Surface Water (Base Map: Ordnance Survey, 2021; Flood Map: Environment Agency, 2021).

Properties have flooded internally within the village of Helions Bumpstead. Figure 1 shows most of the investigation area has a high risk of flooding from surface water; high risk means that each year this area has a chance of flooding of greater than 3.3% (fig.1).

Large areas of the village are shown to be at high surface water flood risk with mapped flow paths following known watercourses within the village. Flow paths north to south and west to east converge in the center of the village near to the crossroads. Further overland flow is shown to flow across field to the east of the village, there is a watercourse adjacent to this flow path however mapped flood flows do not follow this. The surface water flood risk can be viewed [here](#).

Whilst the mapping in figure 1 is a good indicator of risk, due to lack of specific detail on the local drainage system and permeability it is not suitable for a detailed assessment of individual properties. Risk of flooding from surface water is hard to predict as rainfall location and volume are difficult to forecast. In addition, local topography, ground conditions, soil type and the type and location of drainage features can greatly affect the chance and severity of flooding.

Flood History

The most recent flood event was on 25th July 2021, with properties suffering internal flooding and roads becoming impassable. Essex Fire and rescue used boats to rescue residents from properties in Water Lane as the flood water was considered too deep and unsafe for vehicles or rescue on foot. Anecdotal evidence suggests that this is not the first time the village has flooded on this scale, it is reported that properties were flooded approximately 15 years ago as well as in the 1950s. This said smaller floods where properties are not affected but roads are blocked happen on a more regular basis.

Water Lane-

This road became impassable due to the depth and speed of water flowing along it, water was flowing out of bank from higher up the catchment as well as exiting the watercourse which flows alongside Water Lane. The majority of properties along Water Lane were reported to not have been affected from the flood waters as they are slightly higher than the highway. However, a property called Roslyns was flooded from the rear with water entering the property as overland flows from the fields behind. The property also experienced flooding from an Anglian Water manhole which surcharged within their driveway, this caused foul sewerage to enter the property through the front door as well as causing water to back up in toilets etc. Water within the property was approximately 2ft deep. End Cottage also experienced flooding to their driveway from the highway. Two cars elsewhere in the village were also written off as a result of the flooding. It is also reported that a further three properties were flooded along Water Lane located towards the B1054 (south east).

Mill Road-

There is an open watercourse within the fields behind the properties, this then enters a culvert and continues under the gardens of The Bungalows. Water overtops the watercourse at the point of entering the culvert during heavy rainfall events producing overland flows which entered gardens and properties. 3 The Bungalows experienced damage to their kitchen, bathroom and hall, it was reported that this isn't the first with water often gathering to the rear of the property. The gardens of 2&4 The Bungalows were also flooded with water close to the threshold, it is reported that the gardens do flood regularly when there is heavy rain. It is understood that the bungalows are owned by the local Housing Association. A property called Paddock View suffered particularly severe flooding to outbuildings. Water was reported to flow along Mill Road entering the ditch adjacent to the village hall, residents created temporary grips to divert water into the watercourse. The watercourse overflowed subsequently flowing straight under the fence owned by Paddock View. The bottom of the fence was washed away along with the gravel driveway. Flows continued flooding stables with 3ft of water.

Sage End-

Eight properties along this road were affected the majority of the properties were flooded from the rear where the watercourse to the rear of gardens overtopped. 1 Helions Farm Cottage was flooded internally during the event with water flowing along the highway as well as overtopping the watercourse adjacent to the highway. This property was reported to have flooded internally approximately 12 years causing 20k of damage, after which the resident installed a high kerb to divert water away from the property. Unfortunately, this wasn't enough to stop water entering the property on 25th July.

Camps Road-

Two properties were known to flood along this road; Lower House where the conservatory was flooded along with electric tripping the second property was Inglenook. It is not know what damage was caused here.

Drainage System

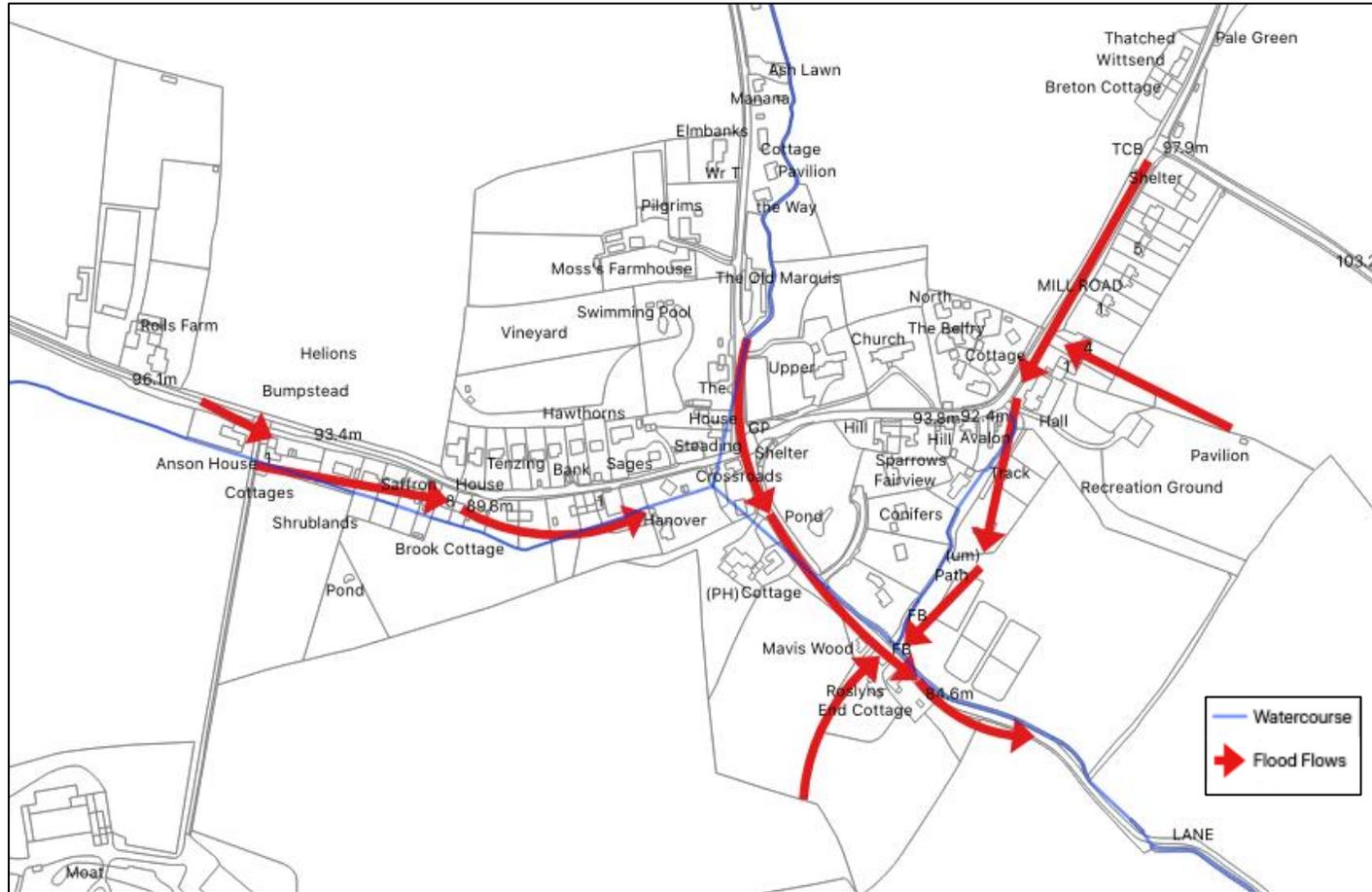


Figure 2 – Indicative Drainage Layout (Ordnance Survey, 2021).

Figure 2 shows the indicative layout of the primary drainage infrastructure in the area, the information was obtained from Environment Agency (EA) Detailed River Network (DRN) Mapping, EH, Anglian Water and site observations.

Much of the drainage infrastructure in the area consists of private ordinary watercourses either open or culverted, there is no formalised Anglian Water surface water system. The Essex highway system has regular gullies along sections of the highway near the centre of the village, this said the highway gullies will ultimately discharge back into the riparian system and as such if any issues with the ordinary watercourses will ultimately affect the highway system. It should be further noted that each road has a different maintenance schedule, this is discussed in further detail below.

The flood flows were reported to flow the National Flood mapping (fig.1) and route of the known watercourses (fig.2) with out of bank flows reported where there are restrictions within the system, including blockages and reduced culvert sizes.

Possible Causes

Riparian Ordinary Watercourses (Open and culverted)

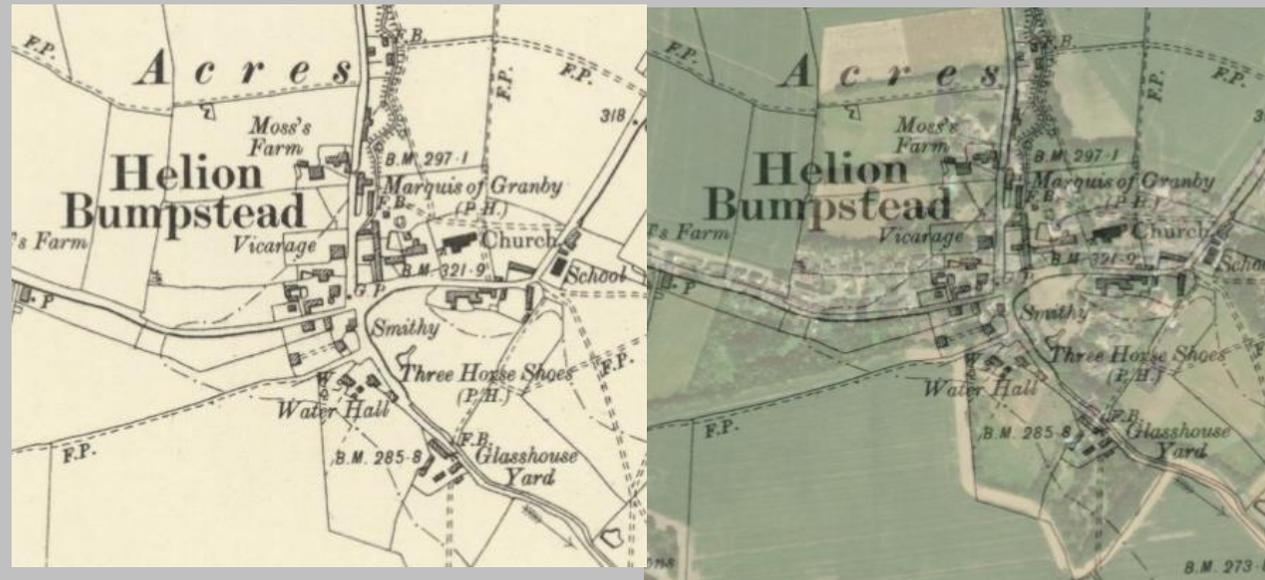
The majority of the surface water drainage within the village consists of riparian owned watercourses a mixture of both culverted and open. During times of heavy rainfall it is particularly important that all watercourses are functioning at full capacity to provide as much flow and storage capacity as possible, preventing surcharging and uncontrolled overland flow. Private culverts and watercourses remain ultimately the responsibility of riparian landowners who are accountable for defects and any direct consequences. It should be noted that blockages within culverted sections of watercourse would be more likely to occur due to the lack of knowledge of its existence. Those culverts that were seen during the site visit appeared to be in good condition with flow entering, however without CCTV surveys this cannot be confirmed.

Areas with cause for concern are listed below, ECC will undertake enforcement action in line with their protocol to ensure ordinary watercourses are maintained. This restrictions and inaccuracies in levels to the watercourse would have caused water flows to slow reducing the volume of water able to get away from the centre of the village.

- Water Lane- Bank protection has been installed to stop erosion of the road however this is also stopping water that has overtopped onto the highway further upstream from entering back into the watercourse.
- Water Lane- Trash screen opposite (first) public footpath sign as exiting the village needs clearing.
- Water Lane- opposite gabion baskets on exiting the village the watercourse has a full blockage.
- Sages End Road- Watercourse behind properties to the south of the highway requires maintenance to both open sections and small culverted section.
- Mill Road- Watercourse and culvert behind The Bungalows requires maintenance, specifically investigation of the culvert under the properties.

Development

Looking at the historic map dating back to 1900ish there has been very little change to the road network in the area. This said there has been development throughout the village with properties now located on the south and north side of Sages End Road to the west of the crossroads towards Rolls Farm and along the eastern side of Mill Road to the north of the village hall. This minor extent of development does not appear to have been an important factor.



(OS 6 Inch 1888-1913)

Essex Highways

Essex Highways were contacted for details of any known issues in the study area. They are aware of the flooding issues in the village with Surface Water Alleviation Schemes (SWAS) schemes being submitted for Sages End Road and a previous one being conducted along Water Lane. A further historical scheme in the area was completed to install a trash screen between the gardens of The Old Marquis and Upper House where the open watercourse enters a culvert under the crossroads through the centre of the village. If this screen were to become clogged with debris additional flooding is liable to happen with overtopping water flowing along the highway. Essex highways have no record of any maintenance agreement associated with this asset therefore riparian ownership would be assumed unless an agreement can be found to counter this.

Both Camps Road and Church Hill (County Priority Roads) are scheduled for annual cyclical cleanse and were most recently cleansed April 2021. Sages End Road is a local road as is Water Lane, these roads are attended in response to defects raised. Sages End Road was most recently attended by the ad hoc jetting team in November 2021.

Rainfall Conditions

Rainfall data was obtained from the Environment Agency's records for the event on 25th July 2021, the nearest gauge is at Steeple Bumpstead approximately two miles east of the affected area. The data was analysed to establish an event rarity for both events.

Rainfall data from 25th July 2021 showed that rainfall occurred from 15:00 until 15:30 with a total of 30.6mm over this 30mins. This event has been analysed using the Flood Estimation Handbook (FEH) to establish an Annual Exceedance Probability (AEP). A 0.5 hour catchment rainfall of 30.6mm has a return period of 126 years which means there is a 0.79% chance of this event happening every year. This indicates a very intense rainfall event.

The parish council reported that there are at least two rain gauges in the villages, which both showed 79mm of rain within 2 hours on the 25th of July which would indicate a very extreme storm event.

It is important to consider that the frequency and intensity of summer storms such as that experienced on the 25th of July 2021 are likely to increase with the impacts of climate change.

Responsibilities and Recommendations

Lead Local Flood Authority

- To ensure that the owners of land on which a culvert, watercourse or drainage system are present are aware of their responsibility to keep the feature clear and functioning effectively.
- Facilitate sharing of information and collaboration between RMAs and the local community.
- Consider using enforcement powers under Section 25 of the Land Drainage Act 1991 should landowners fail to maintain watercourses effectively specifically the watercourse to the rear of properties lining Sages End Road.
- Consider using enforcement powers under Section 24 of the Land Drainage Act 1991 should landowners fail to apply for consent to pipe a watercourse.
- Record and inspect any significant drainage features identified on the site as part of the Flood Risk Asset Register required under Section 21 of the Flood and Water Management Act 2010.

Braintree District Council

- Support LLFA in raising awareness of riparian landowner responsibilities.
- Continue to share information held on drainage layouts with all RMAs.
- Continue to support local communities utilising available resources including LLFA grants.
- Investigate possible funding to develop flood wardens and potentially to install a weather station to ensure increased accuracy of rainfall data.
- Manage flood risk from Ordinary Watercourses as required under Section 14A Land Drainage Act 1991
- To ensure sustainable drainage measures on all new development to prevent increase in flood risk in line with National Planning Policy Framework

Riparian Landowners

- Ensure that watercourses or culverts on, or adjacent to, their land are kept clear and free flowing, specifically the screen outside the old vicarage.
- Provide information to the LLFA on surface water drainage systems which may contribute to/from the infrastructure identified in this report.

Residents/Business Owners

- Take measures to protect themselves and their property when flooding is imminent. The affected properties could install Property Flood Resilience (PFR) using the grant issued by ECC.
- Document and photograph flood incidents where possible, report flooding to BDC or the LLFA.

Essex Highways

- Consider use of powers under Section 100 of The Highways Act 1980 to prevent surface water flowing onto the public highway and/or to properly drain the highway.
 - Continue to work in partnership with other RMAs, providing information and comments and funding when appropriate and to support hydraulic modelling work, the recommendations of which should address/consider the flood risk on the public highway.
 - Inspect and clear highway drainage in the area on a regular basis to reduce flood risk specifically those assets in the village of Helions Bumpstead (Sages End Road)
 - Consider improvements to the highway drainage system, either by installing additional drainage infrastructure or improving the capacity of existing infrastructure specifically around the village hall.
 - Provide information to parish council around how to apply for road closure in the event of flood.
-

Conclusion

We have investigated which Risk Management Authorities have relevant Flood Risk Management Functions in accordance with the FWMA as part of this study. Those RMAs and relevant functions are referenced above within the recommendations section.

It is the conclusion of this report that the flooding events experienced on 25th July 2021 were due to an intense rainfall event (1 in 126yr). This caused the ordinary watercourse system to become overwhelmed with water surcharging from watercourses both open and culverted. Surface water flows also entered the Anglian Water foul system causing manholes to surcharge.

It is recommended that riparian owners ensure maintenance of watercourses both open and culverted on their land. It is further recommended that Anglian Water investigate the surface water that entered their system and make improvement/repairs where deemed necessary. Long term solutions would be to look at the wider catchment land management and work with landowners to reduce run off during the times of increased rainfall. However, the highest importance is for the community to understand that they live in an area with a high flood risk and to accept this risk and look to ultimately protect themselves. Even with measures in place the flood risk will always exist in the village.

These conclusions are based on the evidence available at the time of investigation and may change with further works or study.

Acronyms

BDC	Braintree District Council
EA	Environment Agency
ECC	Essex County Council
EH	Essex Highways
FIR	Flood Investigation Report
FWMA	Flood and Water Management Act 2010
LDA	Land Drainage Act
LLFA	Lead Local Flood Authority
LHA	Local Highway Authority
RMA	Risk Management Authority

Glossary of Terms

Term	Definition
Culvert	Covered channel/pipeline
Main River	All watercourses shown as such on the statutory main river maps held by the Agency and DEFRA or Welsh Office, as appropriate.
Ordinary Watercourse	All rivers, streams, ditches, drains, cuts, dykes, sluices, sewers (other than public sewers) and other passages through which water flows that are not designated as main rivers.
Surface Water	Rainwater which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.

Useful Contacts and Links

Essex County Council

Highways Incident Line 0345 603 7631 (24hrs)
 Flood Investigation Engineer 0345 743 0430 (Mon-Fri, 9am - 5pm)
 All calls may be charged

Legislation

Highways Act 1980: <http://www.legislation.gov.uk/ukpga/1980/66/contents>
 Water Resources Act 1991: <http://www.legislation.gov.uk/ukpga/1991/57/contents>
 Flood and Water Management Act 2010:
<http://www.legislation.gov.uk/ukpga/2010/29/contents>
 Land Drainage Act 1991: <http://www.legislation.gov.uk/ukpga/1991/59/contents>

EA - 'Living on the Edge' a guide to the rights and responsibilities of riverside occupation:
<http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx>

EA - Prepare your Property for Flooding: Reducing flood damage; flood protection products and services
<http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx>

ECC – Flood and Water Management in Essex:
<http://www.essex.gov.uk/flooding>

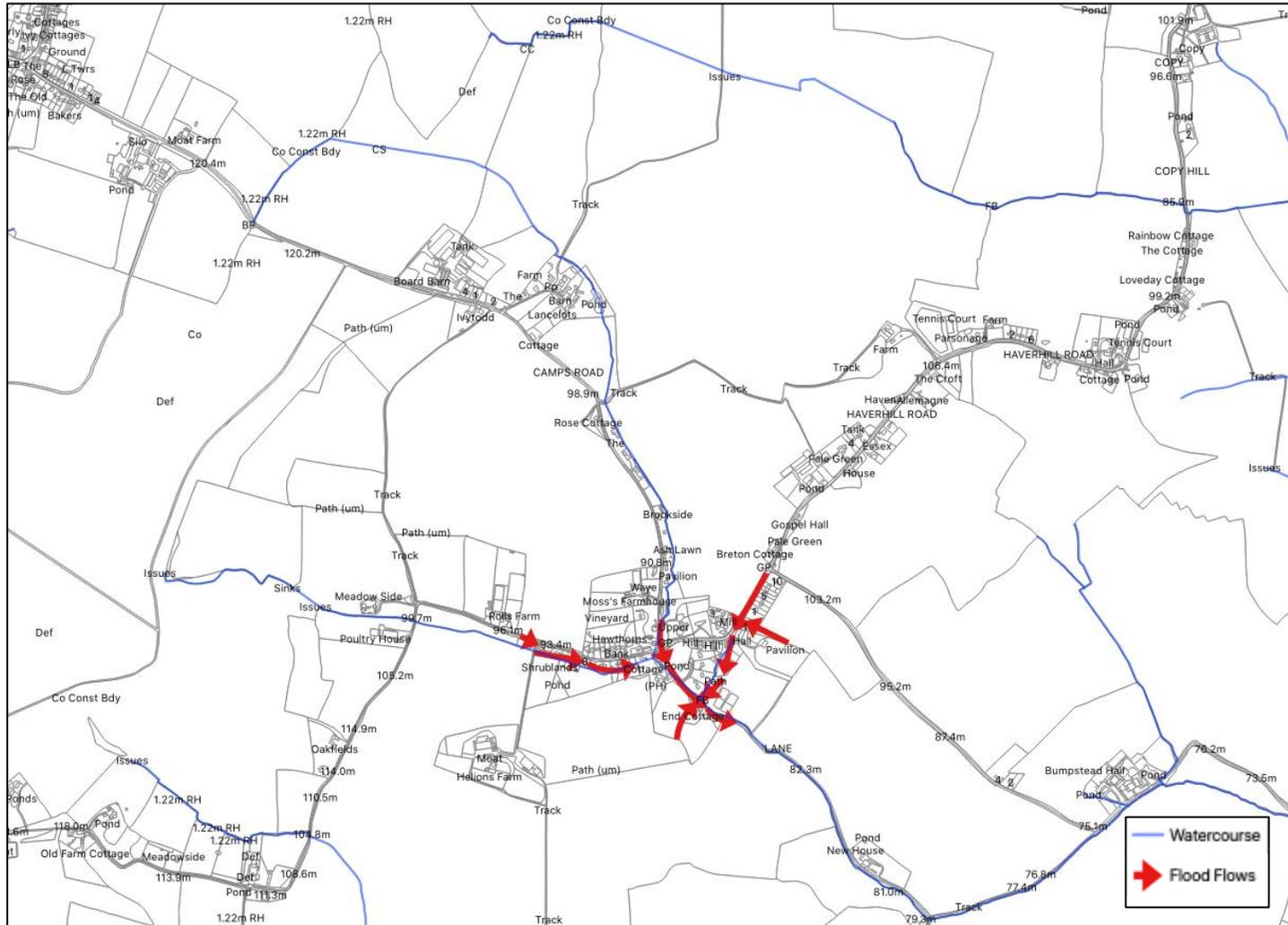
National Flood Forum – Blue Pages: Advice and contacts for flood protection products
<http://www.bluepages.org.uk/>

Six Steps to Flood Resilience: Step-by-step guidance and advice for property owners interested in Property Level Protection
<http://www.smartfloodprotection.com>

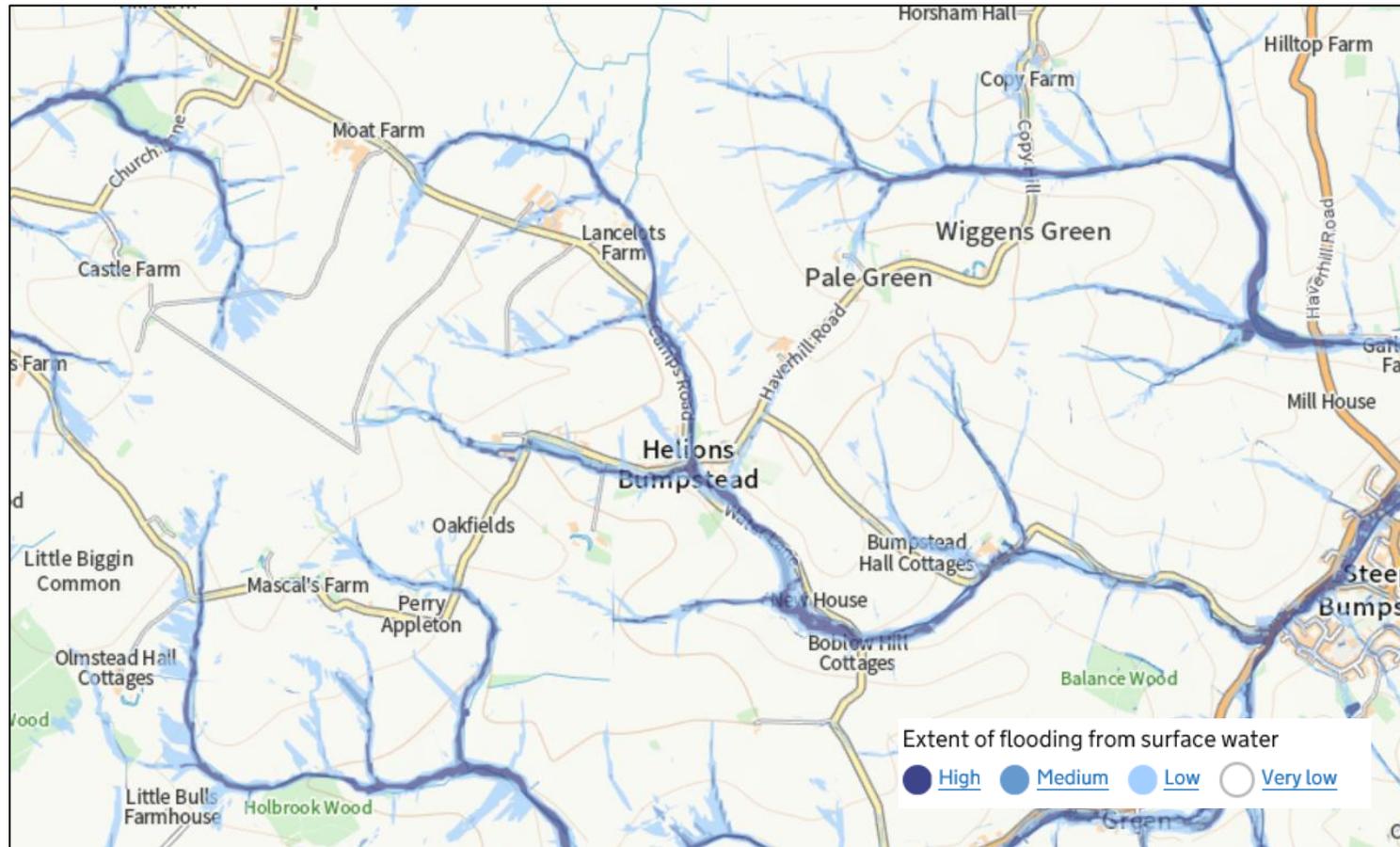
Appendix A – Photos from 25th July 2021 (Provided by residents).



Appendix B – Wider Drainage Network



Appendix C- Extended area of the Risk of Flooding from Surface Water



UFMfSW: EA, 2021. Base Map: Ordnance Survey (2021)