

## Section 19 Flood and Water Management Act 2010

### Report Title: Elm Close, Hazel Close, Greenwood Close & Harewood Terrace, Haverhill

#### Report References:

CRNos 330018, 329910 & 330025



	Name	Date
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## Introduction

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 Sections 19 (1) & (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*

<b>Criteria for an investigation (as per Appendix D of the Suffolk Flood Risk Management Strategy):</b>	
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	

## 1. Location of flooding

An intense localised rainfall event occurred on 25.07.2021 in Haverhill. Nearby Environment Agency (EA) rain gauges at Wixoe & Steeple Bumpstead (see values in brackets) recorded that 14.4mm (45.4mm) fell within 5 hours from 15.15 to 20.00, with 5.0mm (13.4mm) falling in 15 minutes at its peak. To put this in context, the average July rainfall for Haverhill is 92.1mm.

The majority of Haverhill was impacted in some way, with flooding reported to Suffolk County Council (SCC) in Sturmer Road, Hazel Close, High Street, Harewood Terrace, Greenwood Close, Elm Close, Chantry Road & Withersfield Road. This has triggered several Section 19 investigations.

This investigation focusses on the flood events that occurred at four of these locations in Haverhill; Elm Close (property A), Hazel Close (property B), Greenwood Close (property C) & Harewood Terrace (property D). The locations are shown in context on the map extracts below and overleaf.

Elm Close lies to the north-west of Haverhill town centre, Greenwood and Hazel Close lie to the west of the centre while Harewood Terrace lies to the south-west of the centre. While the locations are physically isolated from each other, each was impacted by the same rainfall event in a similar way, with comparable impacts, so they have been considered in a single S19 investigation.

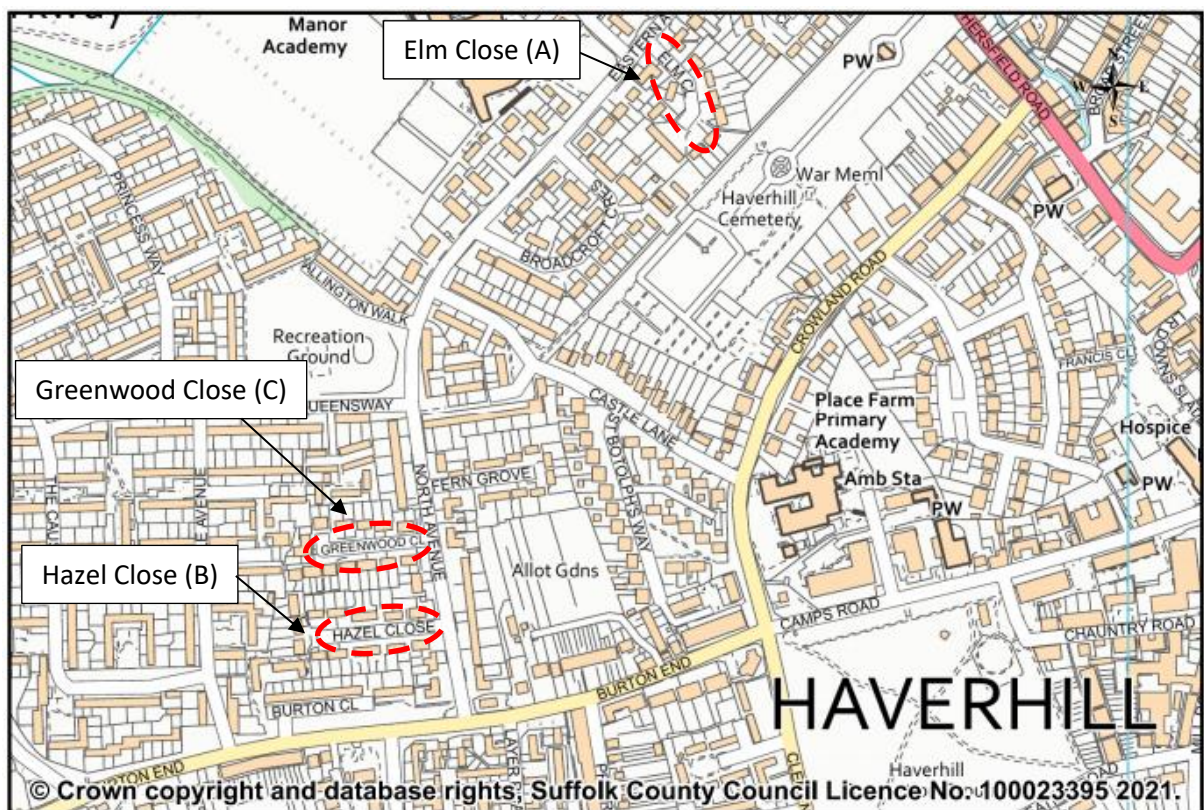


Figure 1 - Investigation Area Map

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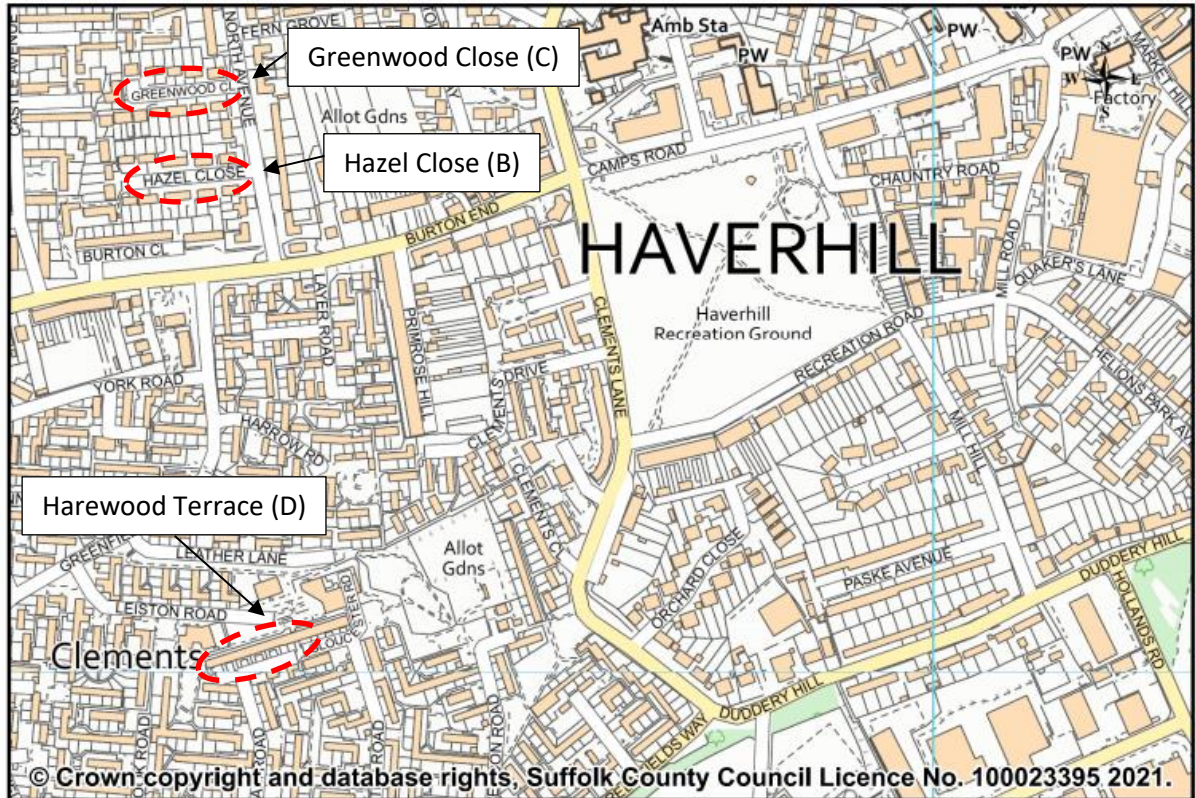


Figure 2 - Investigation Area Map

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## 2. Records of any historical flooding

Whilst the east of England is typically one of the driest parts of the country, summer rainfall events can be very short and intense, leading to the drainage networks being overwhelmed and unable to cope with the volume of water.

Property A (Elm Close), and its neighbour, are reported to have flooded in the July 2021 event and also in August 2020 and at least one further occasion previously of which the occupant(s) could not recall the date.

Anecdotal evidence indicates that properties B & C (Hazel & Greenwood Close) flooded internally in August/September 2020 in addition to July 2021. Properties B & C both have attached garages which flood regularly (at least once per year). Property B had a linear drain installed in front of the garage several years ago which has reduced the frequency and severity of flooding within the garage.

Property D (Harewood Terrace), is reported to have flooded 3 times in the past 3 years (the length of time the current resident has owned the property), including in August 2020.

Shown in Figures 3, 4 & 5 overleaf are a series of map extracts of the recorded historical pluvial flood events as held by SCC. Please note that as not all of the

above events were formally reported to SCC, they do not all appear on the following extracts.

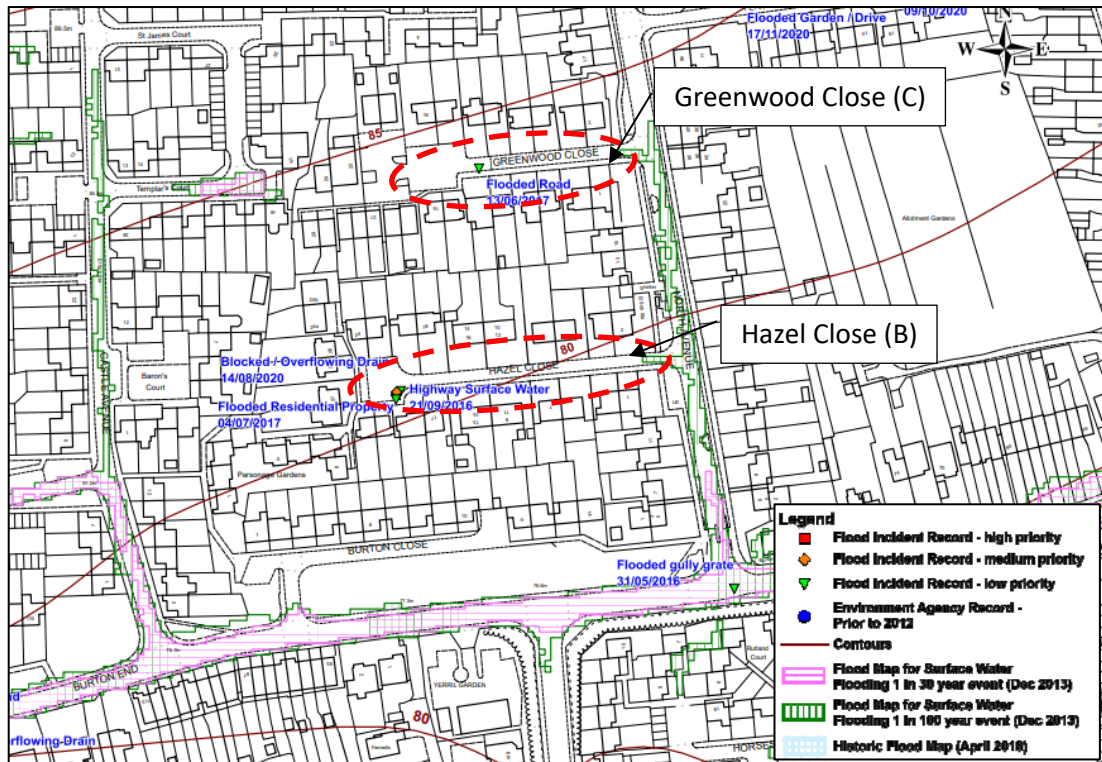


Figure 3 - Historical Pluvial Flood Incidents (to be updated once the 2021 events have been mapped)  
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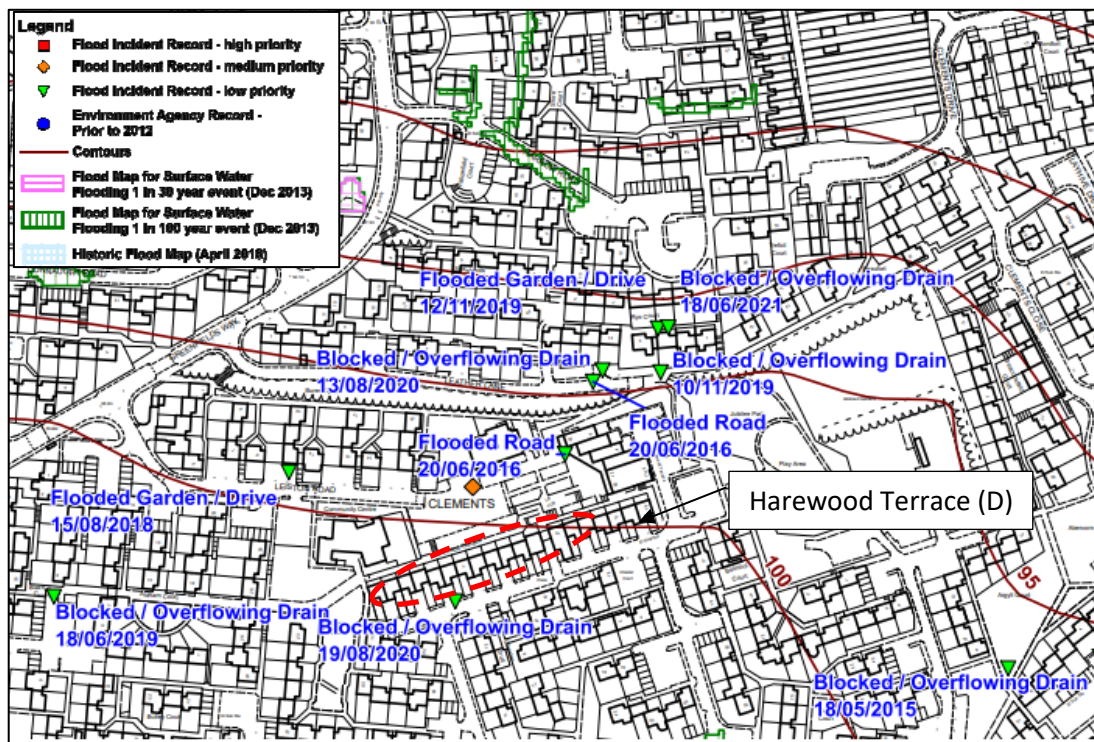


Figure 4 - Historical Pluvial Flood Incidents (to be updated once the 2021 events have been mapped)  
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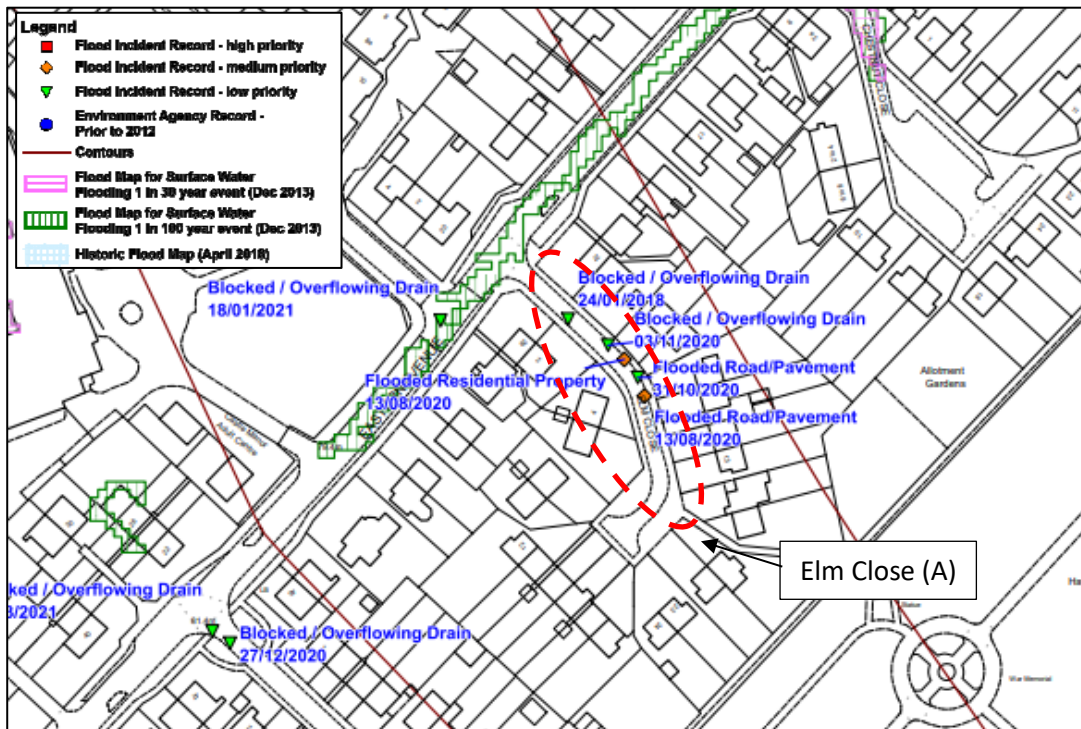


Figure 5 - Historical Pluvial Flood Incidents (to be updated once the 2021 events have been mapped)  
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### 3. Effects of flood event (July 2021)

Property A, in Elm Close, flooded internally. Flood waters accumulated in low spots immediately outside the property adjacent to the front wall (to depths of 300-450mm) and entered through the front door. Water also seeped through the brick work walls. Flooring materials and furniture were damaged in the living room and hallway.

Property B, in Hazel Close, flooded internally via the front door. Flooring on the ground floor was damaged and the elderly resident had to be rehoused for health reasons as a result of the water ingress. The rest of the occupants had to be rehoused for a week while the property was dried out/redecorated etc. The garage was also inundated.

Property C, in Greenwood Close, flooded internally with the living room, hallway and part of the kitchen experienced ingress and damage. Depths were not very great, reaching 50-100mm but spread throughout the ground floor. Externally, depths of surface water accumulations reached 450-600mm adjacent the front door and front wall of the house. The garage was also inundated.

Property D, in Harewood Terrace, flooded internally via the rear garage door with internal depths reaching of up to 450mm. Flooring was damaged along with tools and decorating materials stored on the ground floor in the garage.

Anecdotal evidence indicates water began to recede after approximately 2-3 hours within Properties A, B, C & D and within 24 hours had almost completely drained away.

#### 4. Predicted Flood Risk

The national government indicative “flood risk for planning” map identifies that neither tidal (sea), fluvial (river) or reservoir flooding represent a significant risk in each of the 4 locations. Pluvial (surface water) flooding however is recorded to represent a Low to Very Low risk (each year this location has a risk of flooding of between 0.1-1%) in each of the 4 locations.

Extracts of the pluvial flood mapping are shown below and overleaf for reference. These demonstrate the direction and speed of flow during the worst-case scenario. Dark blue denotes flows faster than 0.25m/s with light blue denoting flow speeds less than 0.25m/s. The small black arrows denote direction of flow.



Figure 6 - Surface water flood risk: water velocity in low-risk scenario (GOV.UK mapping)

The flow path through Elm Close towards Property A, can clearly be seen in the above figure. Likewise, the flow path can clearly be identified past and through Property B, in Hazel Close, in figure 7 overleaf.

The flow paths in Greenwood Close and Harewood Terrace are not so evident from the mapping however this is likely to be a result of the inaccuracies within

the model rather than a true representation of the surface water flow regime locally.

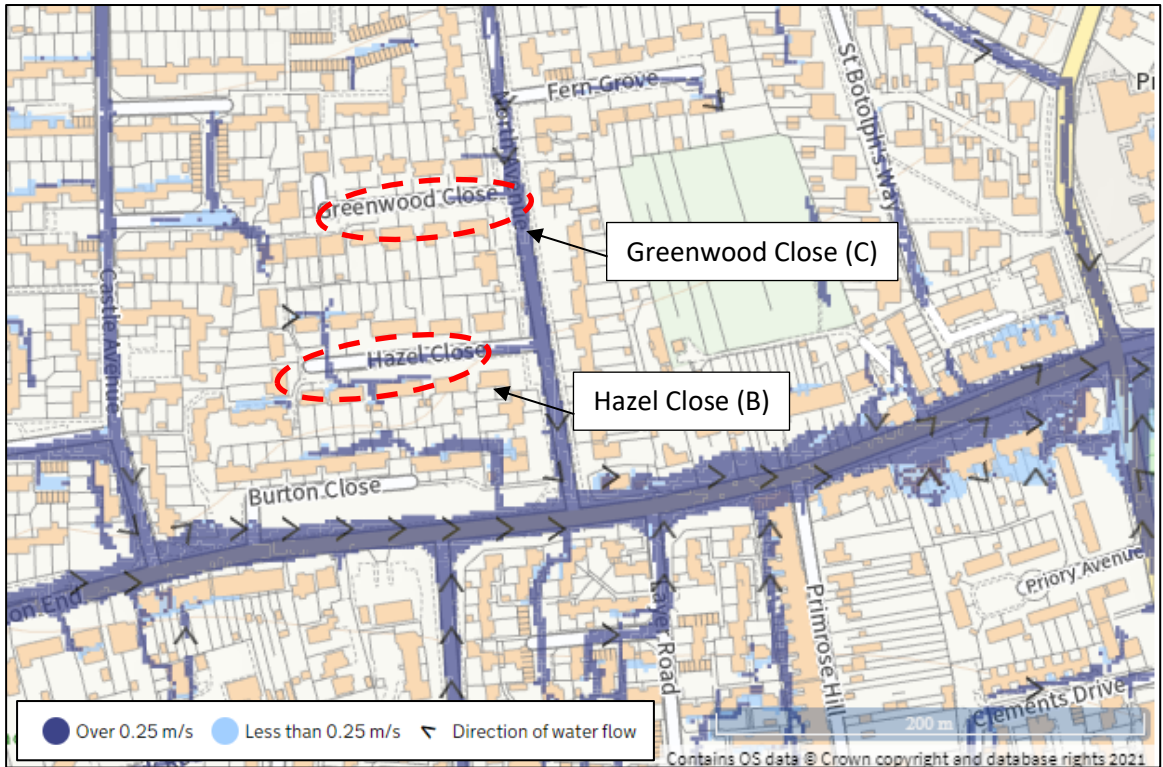


Figure 7 – Surface water flood risk: water velocity in low-risk scenario (GOV.UK mapping)

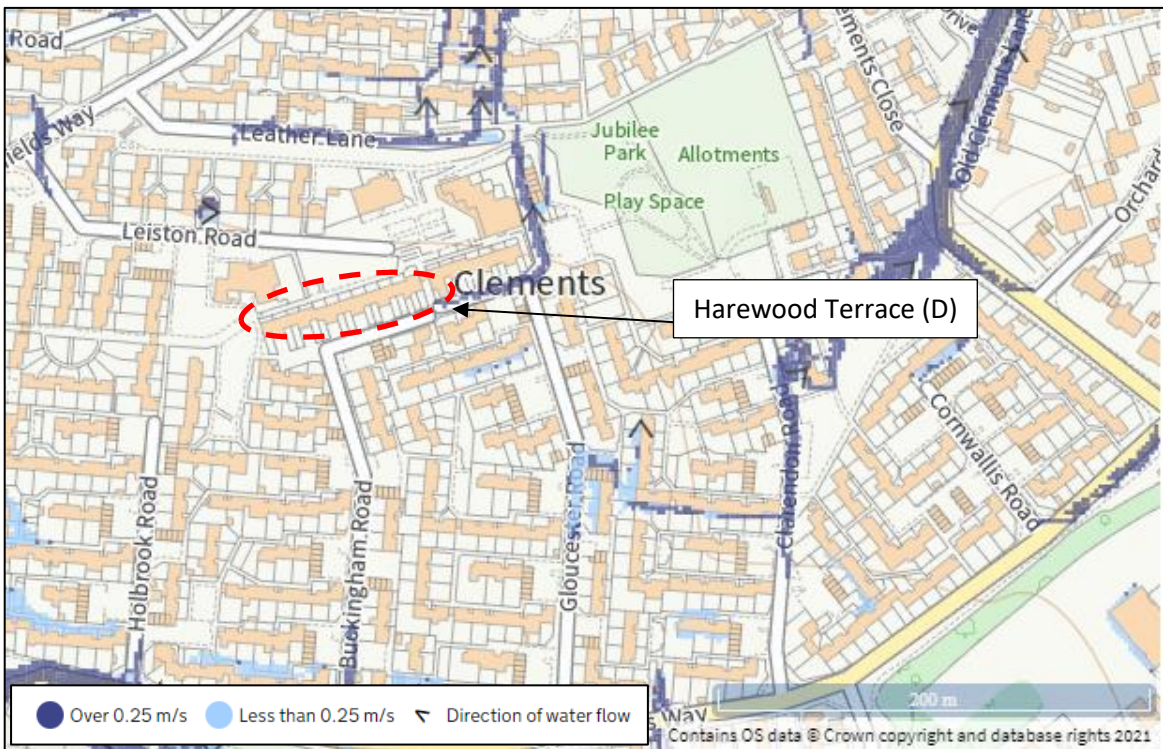


Figure 8 - Surface water flood risk: water velocity in low-risk scenario (GOV.UK mapping)



Haverhill is recorded within the West Suffolk Strategic Flood Risk Assessment (SFRA) 2021 as having limited potential for groundwater flooding to occur at the surface. This suggests groundwater flooding is unlikely to have contributed to this flood event.

## 5. Flooding Sources & Likely causes:

- **Significant rainfall:** one cause of the flooding was the intense nature of the rainfall. 45.4mm (half a month's rainfall) fell in less than 5 hours which overwhelmed the drainage systems which resulted in large volumes of surface water accumulating in the highway.
- **Overwhelmed gullies/unknown highway drainage:** the intensity of the rainfall is likely to be greater than the capacity of the highway gullies which capture runoff from the road and pavements. Further information is required regarding the highway drainage network as whilst the gullies may have been recently checked and cleansed, there are no records of where these gullies discharge to or how surface water captured by these features is managed (eg directed to river or to soakaways).
- **Overwhelmed Anglian Water assets:** the Anglian Water sewers in Hazel Close & Greenwood Close are recorded to be either 100mm or 150mm in diameter which may have contributed to the backing up of runoff through the system. There are no recorded Anglian Water assets in Elm Close or immediately adjacent to Harewood Terrace.
- **Absence of property level flood resilience:** it must be noted that resilience measures may have prevented ingress of water up to a depth of 600mm however the prevention of water ingress at depths greater than 600mm is likely to have structurally damaged the properties due to differential pressure.
- **Elm Close** is served by a single gully, which is located at the lowest point in the cul-de-sac, immediately adjacent to Property A. When this gully cannot accommodate the flows, excess surface water runoff travels towards Property A, following the lie of the land. Property A is situated at a lower elevation than the highway and so surface water accumulates in front of the property and leads to internal flooding. It should also be noted that many of the front gardens have been covered in hard surfacing over time to facilitate parking requirements for the properties. This has significantly increased the contributing area and thus increased the pressure on the existing drainage.
- **Hazel Close** is served by two gullies, with one immediately outside Property B, with the other approximately halfway along the cul-de-sac. Property B is

located adjacent the turning head which would have originally been surrounded by grassed areas, however many of these have been covered in hard surfacing over time to facilitate parking requirements for the surrounding properties. This has significantly increased the contributing area and thus increased the pressure on the gullies.

- In comparison, **Greenwood Close** is served by six gullies. Anecdotal evidence indicates that the surface water runoff backed up within the sewer network in the highway and lifted the manholes/gully grates outside Property C. The pressure within the network created a fountain of water several feet high which flooded the highway and property.
- **Harewood Terrace**, the driveway and garage of Property D are situated at the end of Buckingham Drive which slopes down towards the property. Whilst there are three gullies recorded in the junction, the contributing area is larger than can be easily accommodated by the gullies. The gully nearest the property is not located at the low point in the highway so water naturally accumulates in front of the garage doors.

## 6. Photos of flooding



Floodwater accumulating outside Property A, Elm Close



Surface water accumulating in the highway outside Property A, Elm Close.



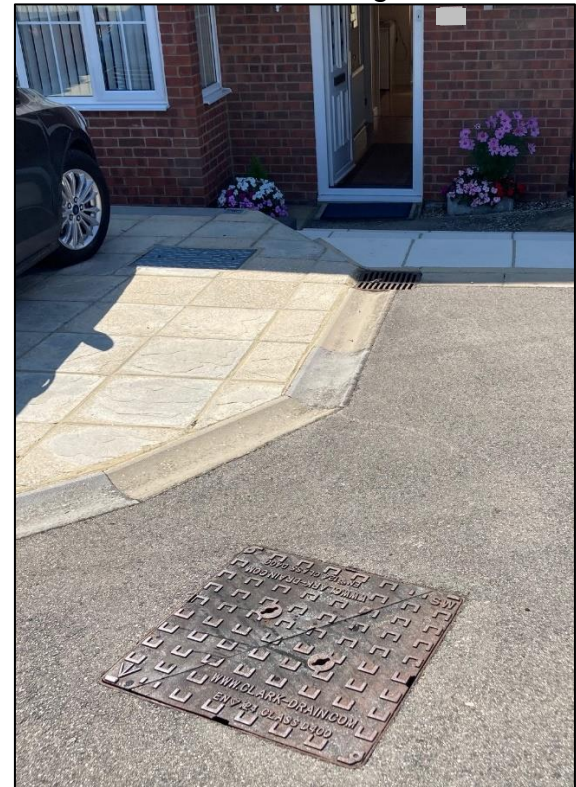
Slope down from highway towards Property B, Hazel Close directing runoff into the front of the house



Areas that were previously laid to grass, now paved over to provide parking areas and contributing to runoff



Sloped driveway/steps down from highway towards Property C, Greenwood Close directing runoff into the front of the house



Manhole immediately outside Property C, Greenwood Close, that was reported to have blown



View of rear of Property D, Harewood Terrace showing slope down drive towards garage



Access gate through fence where surface water travelled into property from the rear

**7. Risk Management Authorities, Non-Risk Management Authority and flood risk function(s)**

<b>Risk Management Authority</b>	<b>Relevant Flood Risk Function(s)</b>
Suffolk County Council SCC	Lead Local Flood Authority, Highways Authority & Asset Owner
Anglian Water AWS	Asset Owner
<b>Non Risk Management Authority</b>	<b>Relevant Flood Risk Function(s)</b>
Property Owners/Occupants	N/A
Havebury Housing Partnership HHP	Landlord Property Owner

## 8. LLFA Recommended Actions:

Action	Risk Management Authority	Timescale for response	Latest Progress Update for Actions
Reactive jetting of highways drainage to ensure existing system is functioning well in Elm Close, Hazel Close, Greenwood Close	SCC HA	March 2022	Pending
Review requirement for Flood Re & Property Flood Level Resilience measures with support from SCC LLFA & National Flood Forum	Property Owners/ Landlords	March 2022	Pending
Investigate to see if additional gullies should be installed in Elm Close & Hazel Close	SCC HA	June 2022	Pending
PFR for Elm Close via Havebury Housing Partnership (property owner) with support from SCC LLFA	HHP & SCC LLFA	June 2022	Ongoing
PFR for Hazel Close, Greenwood Close, Harewood Terrace with support from SCC LLFA	Property Owners – Private & SCC LLFA	June 2022	Pending
Investigate bottle neck in Greenwood Close via CCTV survey	AWS/ SCC HA	June 2022	Pending
Increase jetting frequency for gullies which are identified to have contributed to the flood risk for Properties A, B, C & D.	SCC HA	June 2022	Pending

## 9. Reviews

This report will be reviewed and updated every 3 months until actions are marked as complete

Reviewer	Date of Review

## 10. 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.

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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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