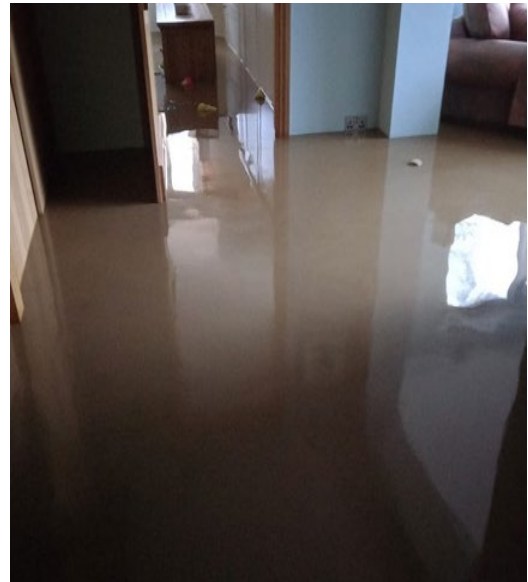




Norfolk County Council

Investigation Report into Countywide Flooding, Autumn and Winter 2021

Report Reference: FIR068 Report prepared by Sean Riseley, John Mellows, Christopher Robinson and Sarah Sims on 22 November 2022



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Executive Summary

Flooding Incidents and Causes

The flooding that occurred in the locations listed below led to the internal flooding of 22 properties.

Road Name	Place	Area	Properties Flooded
Norwich Road	Corpusty	Corpusty	1
Ramsgate Street	Edgefield	Edgefield	4
Holt Road	Gresham	Gresham	1
Bulls Row	Northrepps	Northrepps	5
Heath Lane	Roughton	Roughton	1
The Staithe	Stalham	Stalham	1
The Street	Sutton	Sutton	1
North Walsham Road	Ridlington, Witton	Witton	1
Church Plain	Wells-next-the-Sea	Wells-next-the-Sea	1
Cherrywood Avenue	Wicken Green, Tattersett	Tattersett	1
Flaxlands	Carleton Rode	Carleton Rode	1
Old Watton Road	Colney	Colney	1
Northfield Road	Swaffham	Swaffham	1
Bridge Road	Downham Market	Downham Market	1
Low Road	Grimston	Grimston	1

Key Recommendations

Following flooding to people, property, and infrastructure the following recommendations are made in three areas:

- 1) Risk Management Authorities should:
 - a) Communicate with affected residents where their assets have given rise to the flooding of properties.
 - b) Review the appropriateness of their response to flooding.
 - c) Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand their role in accommodating normal rainfall events as well as mitigating flooding.

- 2) Property owners of affected properties should seek their own legal advice.

- 3) Norfolk County Council (LLFA) should:
 - a) Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (PFRA).
 - b) Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Introduction

This report covers six flood events during autumn and winter 2021. The most notable event was on the 20 October 2021 when significant rainfall caused internal flooding of 12 properties in the North Norfolk District Council area and one in the Breckland District Council area. On the 5 October 2021 significant rainfall caused the internal flooding of two properties in the North Norfolk District Council area and one in South Norfolk Council area. Other incidents of internal flooding to individual properties across the county occurred on the 19 September, 1 October, 18 October, and 9 December 2021.

Justification for Flood Investigation

The purpose of this report relates to Section 19 of the Flood and Water Management Act 2010. This legislation sets out that the County Council, in its role as Lead Local Flood Authority for Norfolk, should investigate the role and response of organisations to significant flooding incidents. Significant flooding is deemed to be those incidents that impact upon people, property, and infrastructure.

The Norfolk Local Flood Risk Management Strategy Policy UC2 (Flood Investigation) sets out the thresholds the Lead Local Flood Authority will apply to its formal flood investigation role. This states that an investigation will be undertaken where it is determined that:

- 1) There is ambiguity surrounding the source or responsibility for a flood incident, and/or
- 2) There is cause to investigate the flood incident, due to either its impact, or consequence.

In judging the impact or consequence of a flood event Norfolk County Council (LLFA) uses the criteria set out below:

- a) Any risk to loss of life or serious injury.
- b) One or more residential or business property flooded internally.
- c) One or more critical services/installations and vulnerable person's properties flooded internally; and/or rendered inoperable or their functions severely compromised due to the access to the premises being impassable; and/or resulting in a loss of service impacting on the local community.
- d) Any section of a national category 3 road or above made impassable due to flooding and/or flooding to priority 1 and 2 gritting routes.
- e) Flooding adversely impacting a rail link by making it impassable.

In this instance it was deemed necessary to complete a formal investigation as multiple residential and business properties flooded internally.

This impact met the County Council's threshold for undertaking a formal flood investigation and the flood investigation report aims to:

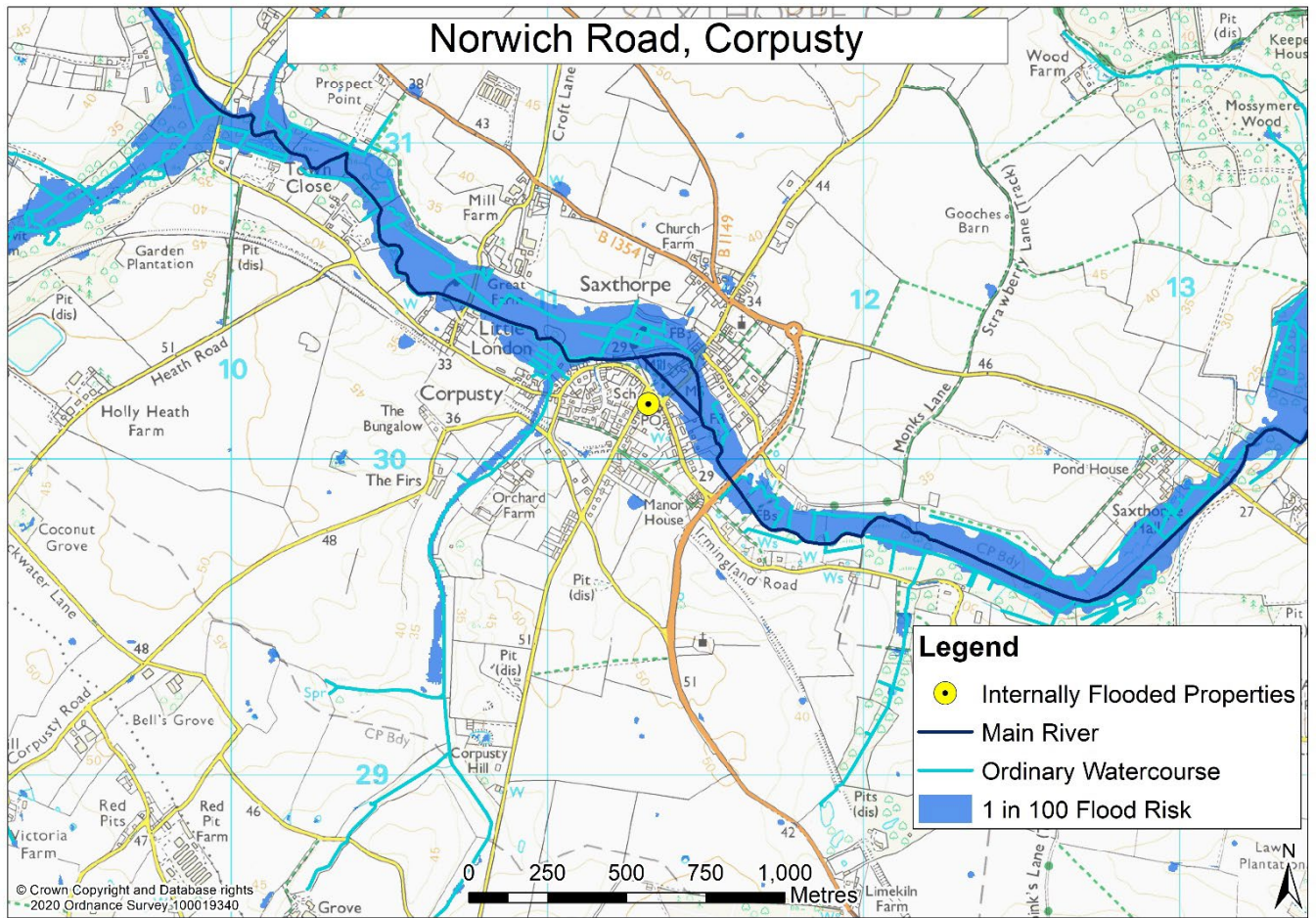
- i) Provide a transparent and consistent review of recent flooding.
- ii) Identify those organisations and individuals who have responsibility to manage the causes of the flooding.
- iii) Identify what their response has been or will be to the flooding.
- iv) Make recommendations as to how the flood risk could be mitigated or reduced.
- v) Provide new evidence of the level of risk faced by communities in Norfolk that can be used in current funding bids in support of flood mitigation schemes.

Mitigation measures include property level protection, reinstating lost drainage features, reviewing or increasing maintenance regimes and increasing the capacity of the drainage network.

The flood investigation report cannot:

- Resolve the flooding issues or provide designed solutions.
- Force authorities to undertake any of the recommended actions.

North Norfolk District Council
Flooding and Flood Risk within the Corpusty Area



Map of Corpusty Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	On the 20 October 2021 one property was internally flooded on Norwich Road, Corpusty. This incident was reported by a resident via an online flood report form on the 21 October 2021 (FWF/21/5738)	Norfolk County Council (LLFA) assessed the validity and impact of the flood report and visited the affected residents to offer advice and gather information after the incident. Anglian Water attended and cleared the obstruction in their drainage system during the incident. Anglian Water assessed the capacity of its drainage system and identified the need to renew the existing drainage scheme that serves the flooding location after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

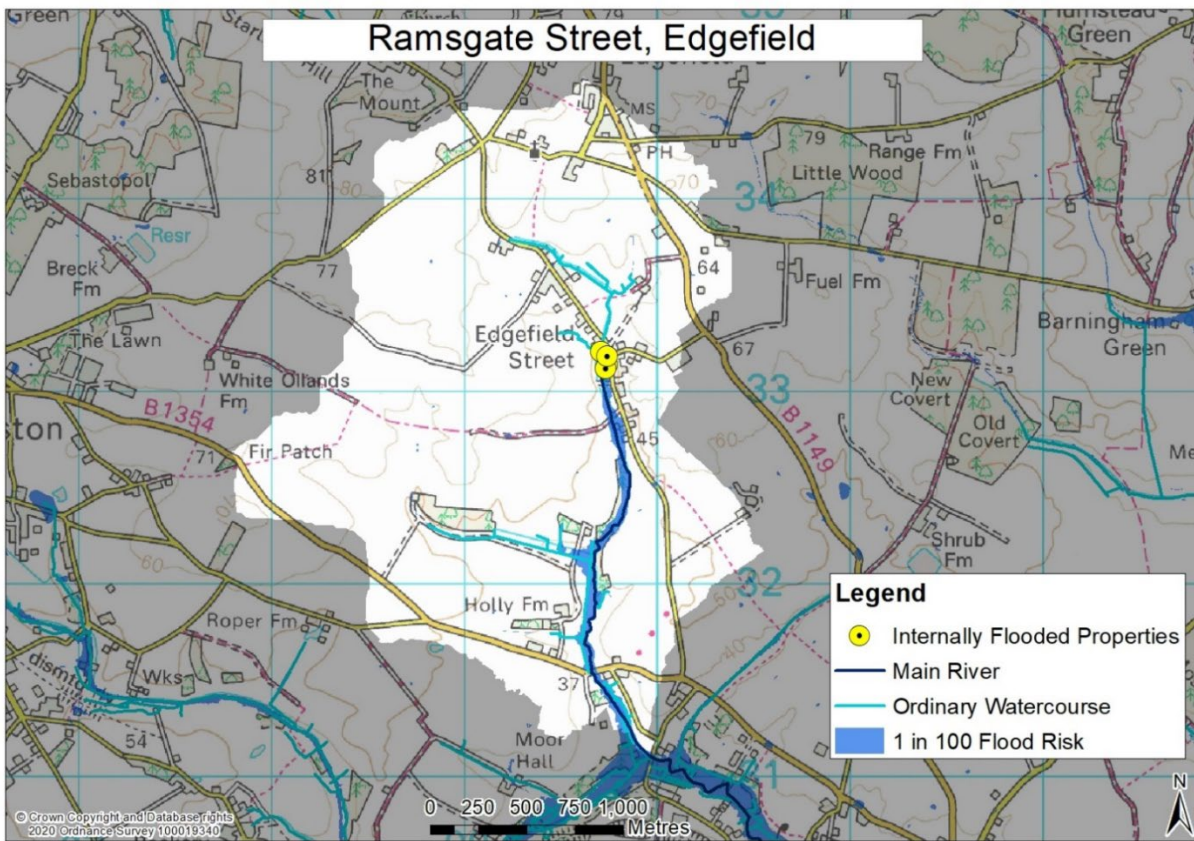
No historic internal flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Norwich Road, Corpusty, 20 October 2021	<p>The foul drainage system was obstructed by debris or silt. This caused the failure of the upstream drainage system contributing to flooding at the affected properties.</p> <p>Significant rainfall was directed into the foul system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property.</p>	Anglian Water should instigate a regular regime of maintenance to ensure the system is free from obstruction at all times.	Anglian Water

Flooding and Flood Risk within the Edgefield Area



Map of Edgefield Area.

Flood Incidents within this Area

Within this area four incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	On 20 October 2021 four properties were internally flooded on Ramsgate Street, Edgefield. These incidents were reported by residents via an online flood report form on the 25 (FWF/21/5774), 26 (FWF/21/5783), 27 (FWF/21/5797), and 29 October 2021 (FWF/21/5808).	Norfolk Fire and Rescue Service attended and pumped out during the incident. Norfolk County Council (LLFA) assessed the validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident. Norfolk County Council (Highways) identified the need to renew the existing drainage scheme that serves the flooding location after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated. There were no rain gauges within 2.5km of the incidents of flooding within this area.

Historic Flooding Incidents within the Area

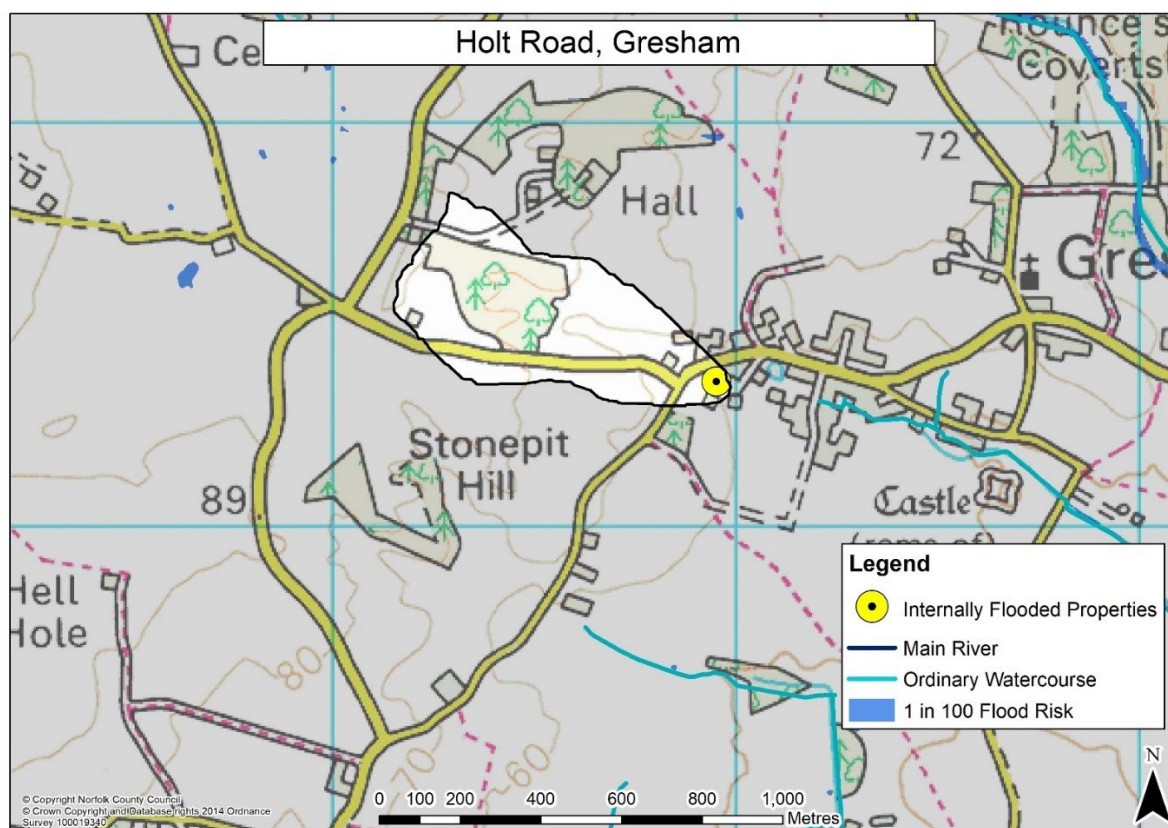
No confirmed historic internal Flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Ramsgate Street, Edgefield, 20 October 2021	Surface run-off from significant rainfall flowed off adjacent fields and onto the accesses of affected properties that were situated lower than these features.	Landowners to find ways to reduce the amount of run-off reaching properties during significant rainfall. Norfolk County Council (LLFA) to provide advice as required.	Landowners
Ramsgate Street, Edgefield, 20 October 2021	The watercourse was obstructed by debris on a trash screen in front of a culvert maintained by Norfolk County Council (Highways). This caused the watercourse to overtop onto the highway and flow along the road network, then onto the accesses of affected properties that were situated lower than these features.	<p>Norfolk County Council (Highways) should consider removing the trash screen to prevent build-up of debris.</p> <p>Norfolk County Council (Highways) should consider developing a solution to mitigate the risk experienced at this location. This may include:</p> <ol style="list-style-type: none"> 1) Routing of flood water away from the affected properties 2) Survey of the existing system 3) Working with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events <p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.</p>	<p>Norfolk County Council (Highways and LLFA)</p> <p>Property Owners</p>

Flooding and Flood Risk within the Gresham Area



Map of Gresham Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	On the 20 October 2021 one property was internally flooded on Holt Road, Gresham. This incident was reported by a resident via an online flood report form on the 20 October 2021 (FWF/21/5729).	Norfolk County Council (LLFA) assessed validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This

distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There are no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

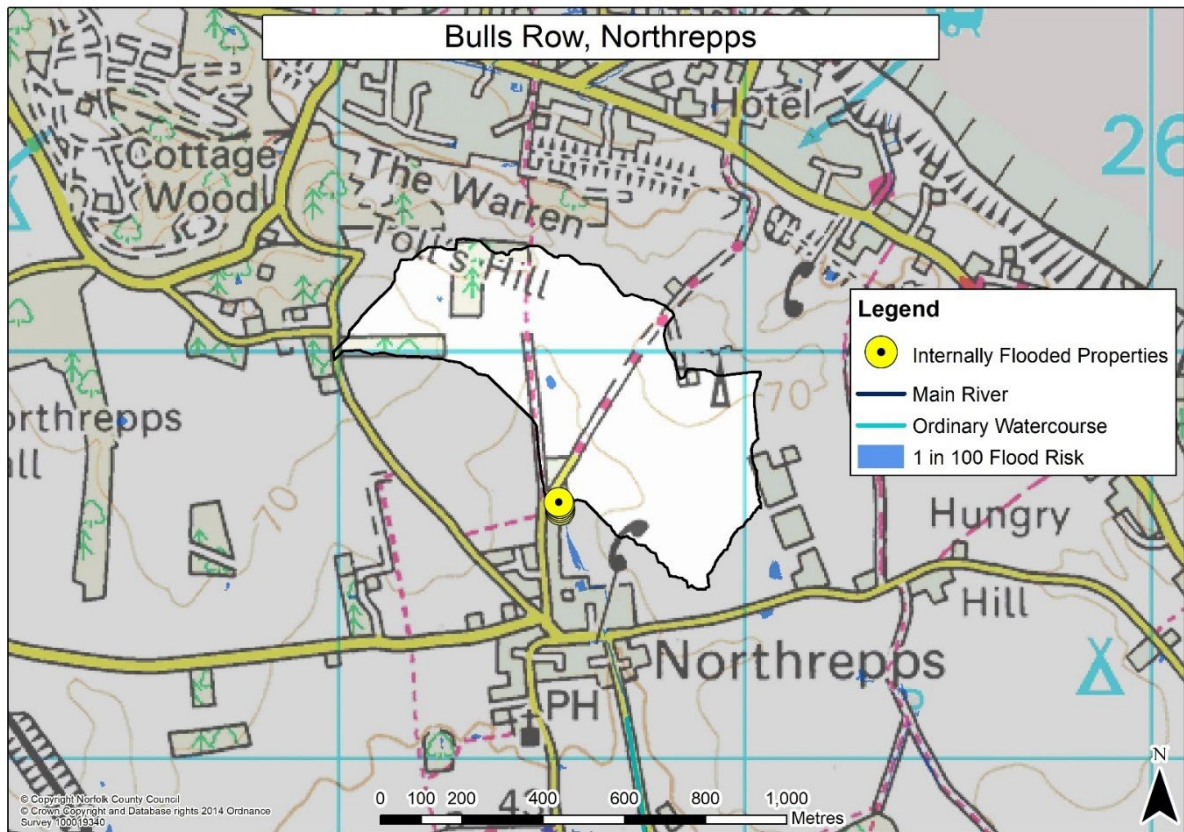
No historic internal flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Holt Road, Gresham, 20 October 2021	Surface run-off from significant rainfall flowed off adjacent fields and onto the accesses of the affected property situated lower than these features.	Local landowners to consider changing land management practices to reduce the run-off to the affected property. Norfolk County Council (LLFA) to provide advice as required. Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.	Landowners Property owners Norfolk County Council (LLFA)

Flooding and Flood Risk within the Northrepps Area



Map of Northrepps Area

Flood Incidents within this Area

Within this area five incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	<p>On the 20 October 2021 five properties were internally flooded on Bulls Row, Northrepps. These incidents were reported by a resident via an online flood report form on the:</p> <p>21 October (FWF/21/5747), 24 October (FWF/21/5767), 29 October (FWF/21/5772), 4 November (FWF/21/5780), 24 November (FWF/21/5788).</p>	Norfolk County Council (LLFA) assessed the validity and impact of the flood and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this area.

Historic Flooding Incidents within the Area

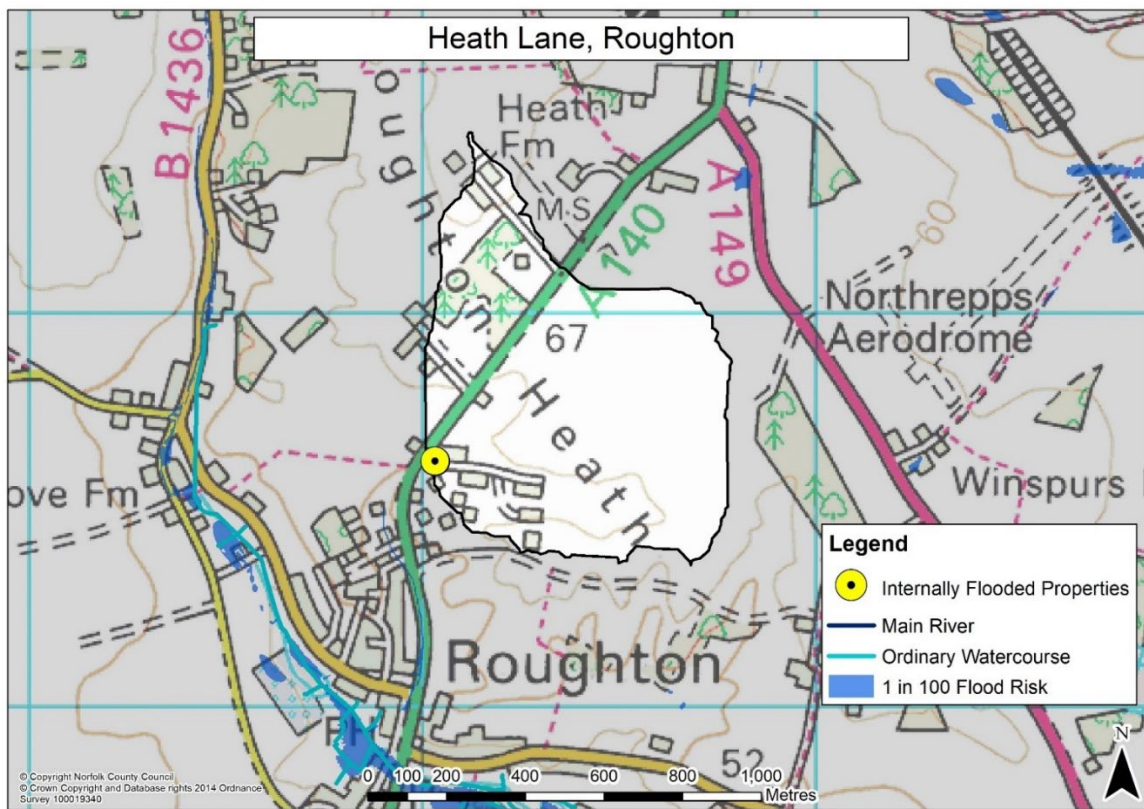
No confirmed historic internal flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Bulls Row, Northrepps, 20 October 2021	Surface run-off from significant rainfall flowed off adjacent fields and onto the accesses of affected properties that were situated lower than these features.	Landowners to ensure drainage ditches are maintained and consider changing land management practices to reduce run-off towards the affected properties. Norfolk County Council (LLFA) to provide advice as required.	Landowners
Bulls Row, Northrepps, 20 October 2021	Run-off from significant rainfall was concentrated along overland flowpaths on which the affected properties are positioned on.	Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.	Property Owners Norfolk County Council (LLFA)

Flooding and Flood Risk within the Roughton Area



Map of Roughton Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	On the 20 October 2021 one property was internally flooded on Heath Lane, Roughton. This incident was reported by a resident via an online flood report form on the 30 October 2021, (FWF/21/5811)	Norfolk County Council (LLFA) assessed validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

The following table lists flooding incidents within the area that have been recorded.

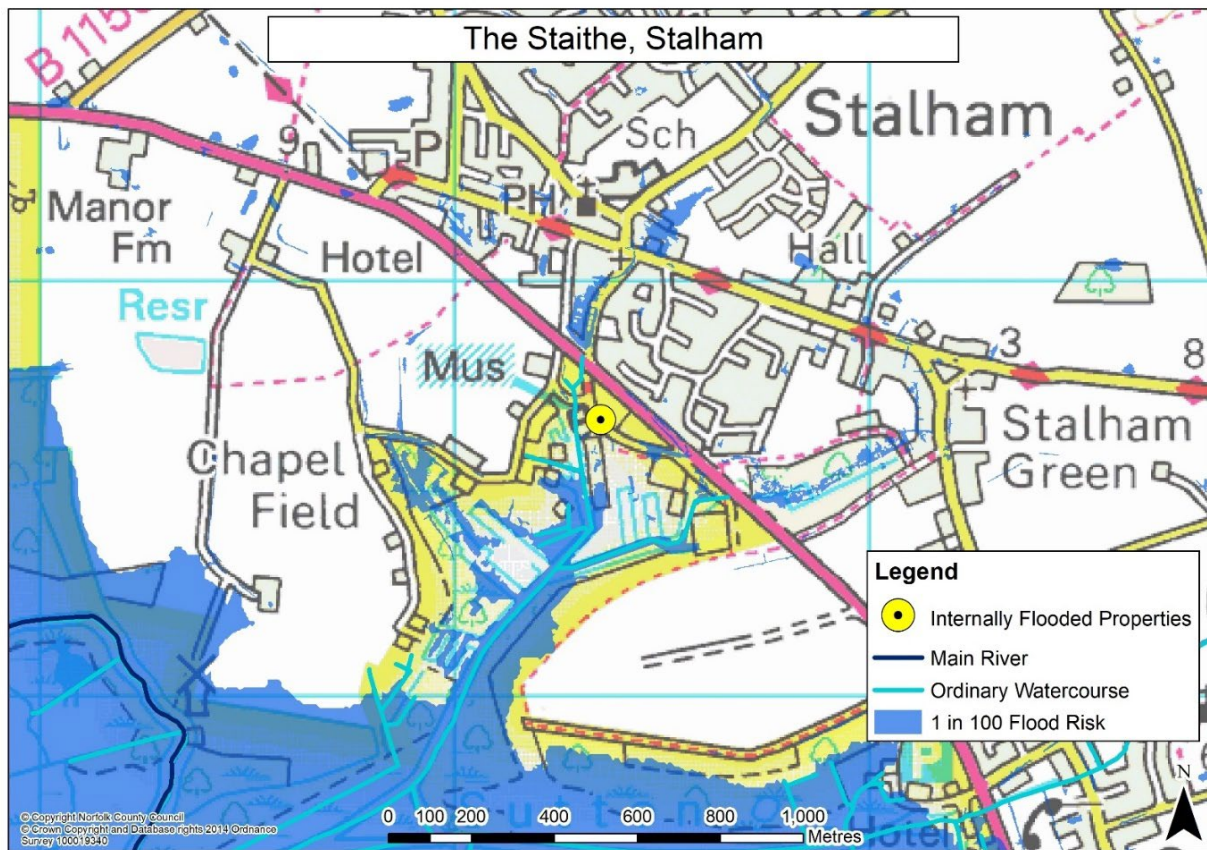
Date of incident	Impact	Rainfall Intensity
23 December 2020	One property on Heath Lane internally flooded.	Heavy rain

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendations	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Heath Lane, Roughton, 20 October 2021	Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is positioned on.	<p>Landowner to include legal requirement for tenants to retain ditches and other flood prevention features in tenancy agreement.</p> <p>Landowner and tenants to review land management practices to reduce the run-off and direct water away from the affected property.</p> <p>Property owners should protect their buildings through flood protection measures where appropriate.</p>	<p>Landowners/tenants</p> <p>Property owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and Flood risk within the Stalham Area



Map of Stalham Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
5 October 2021	On the 5 October 2021 one property was internally flooded on The Staithe, Stalham. This incident was reported by a resident via email correspondence on the 6 October 2021 (FWF/21/5712).	Norfolk County Council (LLFA) assessed the validity and impact of the flood report and visited the affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

The following table lists flooding incidents within the area that have been recorded.

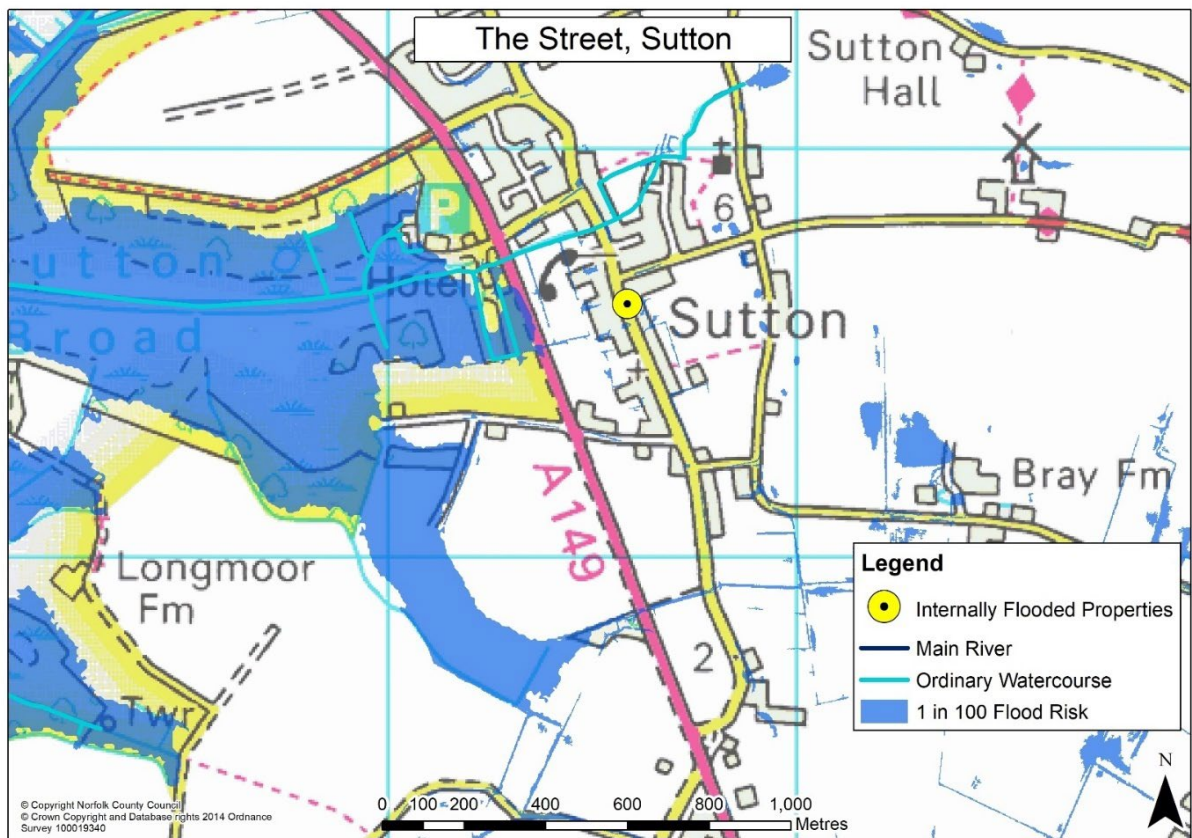
Date of incident	Impact	Rainfall Intensity
15 December 2015	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
23 June 2016	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
30 April 2018	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
04 June 2018	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
06 October 2019	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
28 August 2020	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
23 December 2020	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
08 July 2021	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain
05 October 2021	One property flooded internally on Upper Staithe Road, Stalham	Heavy rain

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
The Staithe, Stalham, 05/10/2021	Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.	Norfolk County Council (Highways) should review the level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. This should include consideration of all Highways' assets contributing to the flooding	Norfolk County Council (Highways)
The Staithe, Stalham, 05/10/2021	Significant rainfall was directed into the foul system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property.	Anglian Water should work with the property owner to investigate possible improvements to prevent foul water surcharging into the property during flood events.	Anglian Water Property Owners

Flooding and Flood Risk in the Sutton Area



Map of Sutton Area

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
5 October 2021	On the 5 October 2021 one property was internally flooded on The Street, Sutton. This incident was reported by a member of the public via a flood questionnaire on the 5 October 2021, (FWF/21/5693)	Norfolk County Council (LLFA) assessed validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

No previous incidents of internal flooding have been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
The Street, Sutton, 5 October 2021	The surface water drainage system network was partially obstructed by silt and high water levels downstream. This reduced the efficiency caused the failure of the upstream drainage system contributing to flooding at the affected properties.	<p>Riparian owners should instigate a regular regime of maintenance to ensure their watercourses are free from obstruction (i.e., tree leaves/roots) at all times.</p> <p>Norfolk County Council (Highways) should review the level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. This should include consideration of all Highways' assets contributing to the flooding</p>	<p>Riparian Owners</p> <p>Norfolk County Council (Highways)</p>
The Street, Sutton, 5 October 2021	<p>Run-off from significant rainfall pooled at a low point within the area affecting property.</p> <p>The flood water entered the property through low thresholds at entrance and the air bricks.</p>	<p>Property owners should protect their buildings through flood protection measures where appropriate.</p> <p>Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements and installing sump pumps.</p>	<p>Property Owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and Flood risk within the Witton (Ridlington) Catchment



Map of Witton (Ridlington) Catchment.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
18 October 2021	On the 18 October 2021 one property was internally flooded on North Walsham Road, Witton. This incident was reported by a resident via an online flood report form on the 27 October 2021 (FWF/21/5798)	Norfolk County Council (LLFA) assessed validity and impact of the flood report after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

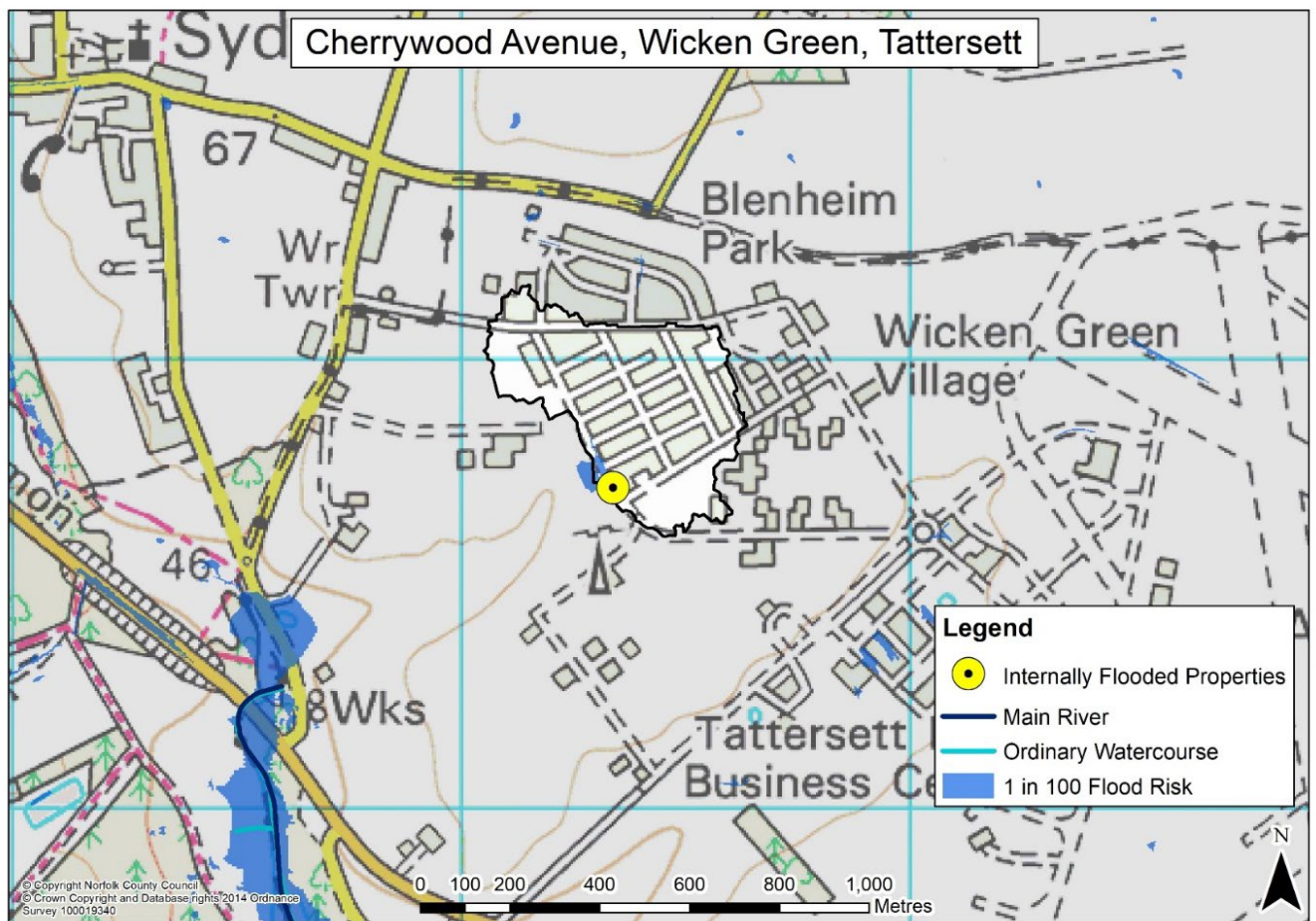
No historic internal flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
North Walsham Road, Witton, 18 October 2021	Significant rainfall was concentrated on the highway at a low point close to the wall of the property. Vehicles using the highway passed through the flood water causing it to wash towards the affected property.	Norfolk County Council (Highways) should consider options that would prevent water from pooling on the highway.	Norfolk County Council (Highways)

Flooding and Flood Risk within the Tattersett Area



Area Map of Cherrywood Avenue

Flood Incidents within this area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
19 September 2021	On the 19 September 2021 one property was internally flooded on Cherrywood Avenue, Wicken Green, Tattersett. This incident was reported by Norfolk Fire and Rescue Service via email correspondence on the 19 September 2021, (FWF/21/5760)	Norfolk Fire and Rescue Service visited affected residents to offer advice and to gather information during the incident. Norfolk County Council (LLFA) assessed validity and impact of the flood report after the incident.

Recent rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

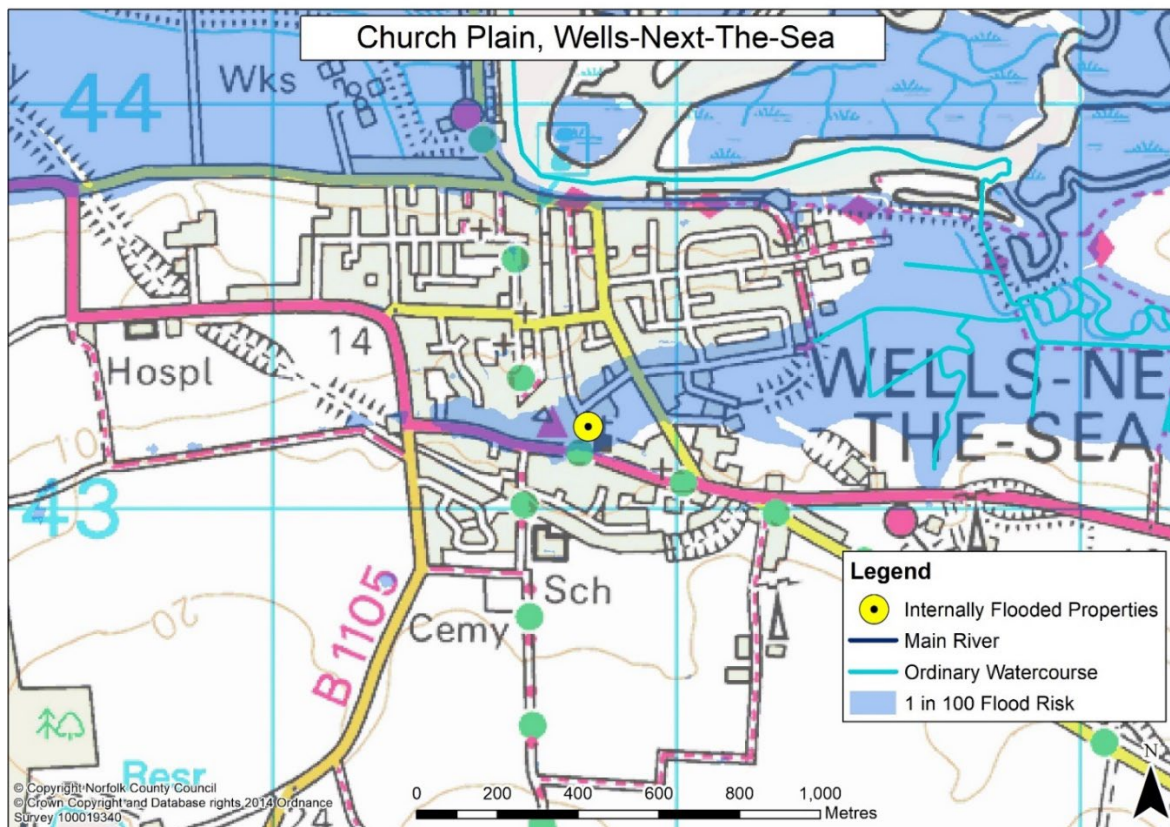
Date of incident	Impact	Rainfall Intensity
9 September 2022	One property flooded internally on Cherrywood Avenue (FWF/22/6597).	Heavy rain
16 August 2022	One property flooded internally on Cherrywood Avenue (FWF/22/6598).	Heavy rain
20 July 2019	One property flooded internally on Cherrywood Avenue (FWF/21/6599).	Heavy rain

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Cherrywood Avenue, Tattersett, 19 September 2021	<p>Surface run-off from significant rainfall made its way onto private roads and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.</p> <p>Significant rainfall was directed into the soakaways which had insufficient capacity to take the amount of surface run-off.</p>	<p>The Management Company should consider opportunities to route flood water on private roads away from affected properties to alternative points of discharge, or other solutions as practicable.</p> <p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.</p>	<p>The Management Company</p> <p>Property owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and Flood Risk within the Wells-next-the-Sea Area



Map of Wells-next-the-Sea Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood incident
5 September 2021	On the 5 September 2021 one property was internally flooded on Church Plain, Wells-next-the-Sea. This incident was reported by a resident via email correspondence on the 26 May 2022 (FWF/22/6354).	Norfolk County Council (LLFA) visited affected residents to offer advice and to gather information after the incident. Anglian Water visited affected residents to offer advice and to gather information after the incident. Anglian Water assessed the capacity of their drainage system after the incident. Anglian Water identified a fault in the system allowing ground water to infiltrate and fixed the issue.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

The incident of internal flooding in this area is within 2.5km of a rain gauge. However, no rainfall was recorded on 5 September 2021, despite rainfall being reported at the property.

Historic Flooding Incidents within the Area

Date of incident	Impact	Rainfall Intensity
July 2018	One property reported as flooded internally on Church Plain.	Heavy rain
August 2017	One property reported as flooded externally on Church Plain.	Heavy rain

Causes of Flooding within the Area and Recommendations

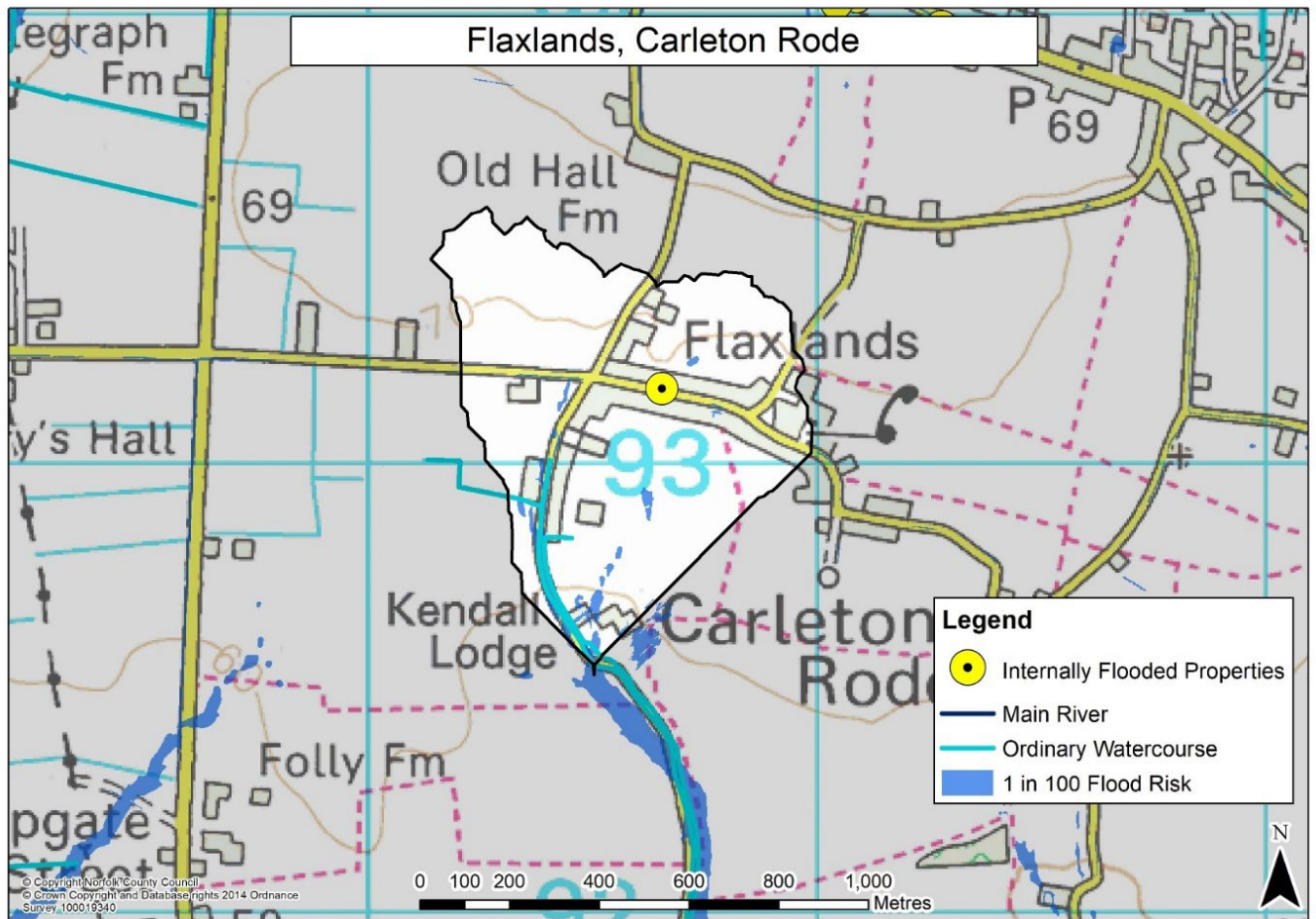
The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Church Plain, Wells-next-the-Sea, 5 September 2021	Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.	Norfolk County Council (Highways) should consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable.	Norfolk County Council (Highways)
Church Plain, Wells-next-the-Sea, 5 September 2021	The surface water drainage system was partially obstructed by debris and/or high water levels downstream. The system was also affected by a break which allowed groundwater to infiltrate. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.	<p>Anglian Water should review the capacity and level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified.</p> <p>Anglian Water should assess whether the capacity of the current system is able to provide protection that aligns with British standards. This may require a survey of the system being undertaken. Anglian Water should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e., tree leaves/roots) at all times.</p>	Anglian Water

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Church Plain, Wells-next-the-Sea, 5 September 2021	Run-off from rainfall was directed towards the surface water network. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected property.	Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events	Anglian Water

South Norfolk District Council

Flooding and Flood Risk within the Carleton Rode Area



Map of Carleton Rode Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood incident
9 December 2021	On 9 December 2021 one property was internally flooded on Flaxlands, Carleton Rode. This incident was reported by a resident via a flood questionnaire on the 10 January 2022 (FWF/21/5887).	Norfolk County Council (Lead Local Flood Authority) assessed validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

The following table lists flooding incidents within the area that have been recorded.

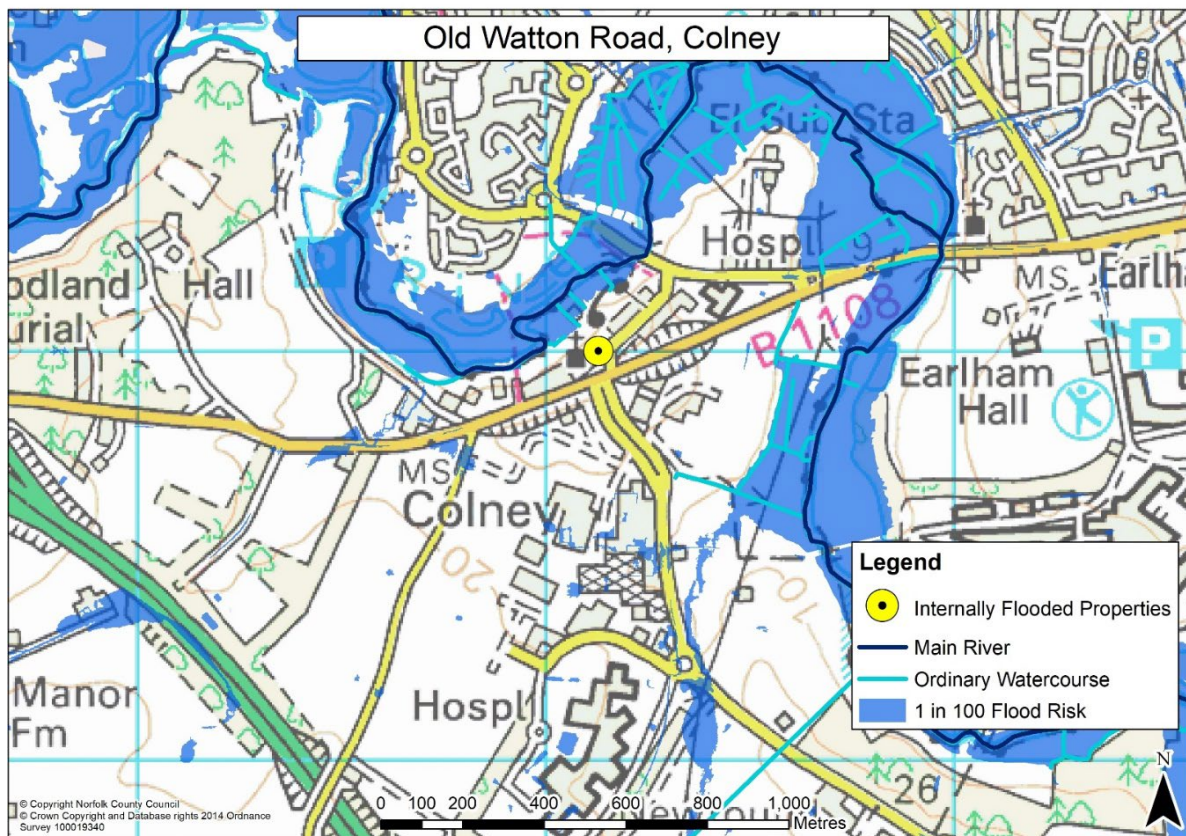
Date of incident	Impact
Anecdotal reports of Ongoing issues	External flooding to properties on Flaxlands.

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Flaxlands, Carleton Rode, 9 December 2021	The watercourse was partially obstructed by debris and silt downstream. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.	The riparian owners should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e., tree leaves or roots) at all times.	Riparian owners
Flaxlands, Carleton Rode, 9 December 2021	Surface run-off from significant rainfall flowed off adjacent fields and was directed into the watercourse. This caused it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property.	Riparian landowners should consider surveying the watercourse to confirm that there is a positive gradient downstream. Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) should communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.	Riparian owners Property owners Norfolk County Council (LLFA)

Flooding and Flood Risk within the Colney Area



Map of Colney Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
5 October 2021	On the 5 October 2021 one property was internally flooded on Old Watton Road, Colney. This incident was reported by a resident via email correspondence on the 12 October 2021, (FWF/21/5726)	Norfolk County Council (LLFA) assessed validity and impact of the flood report and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

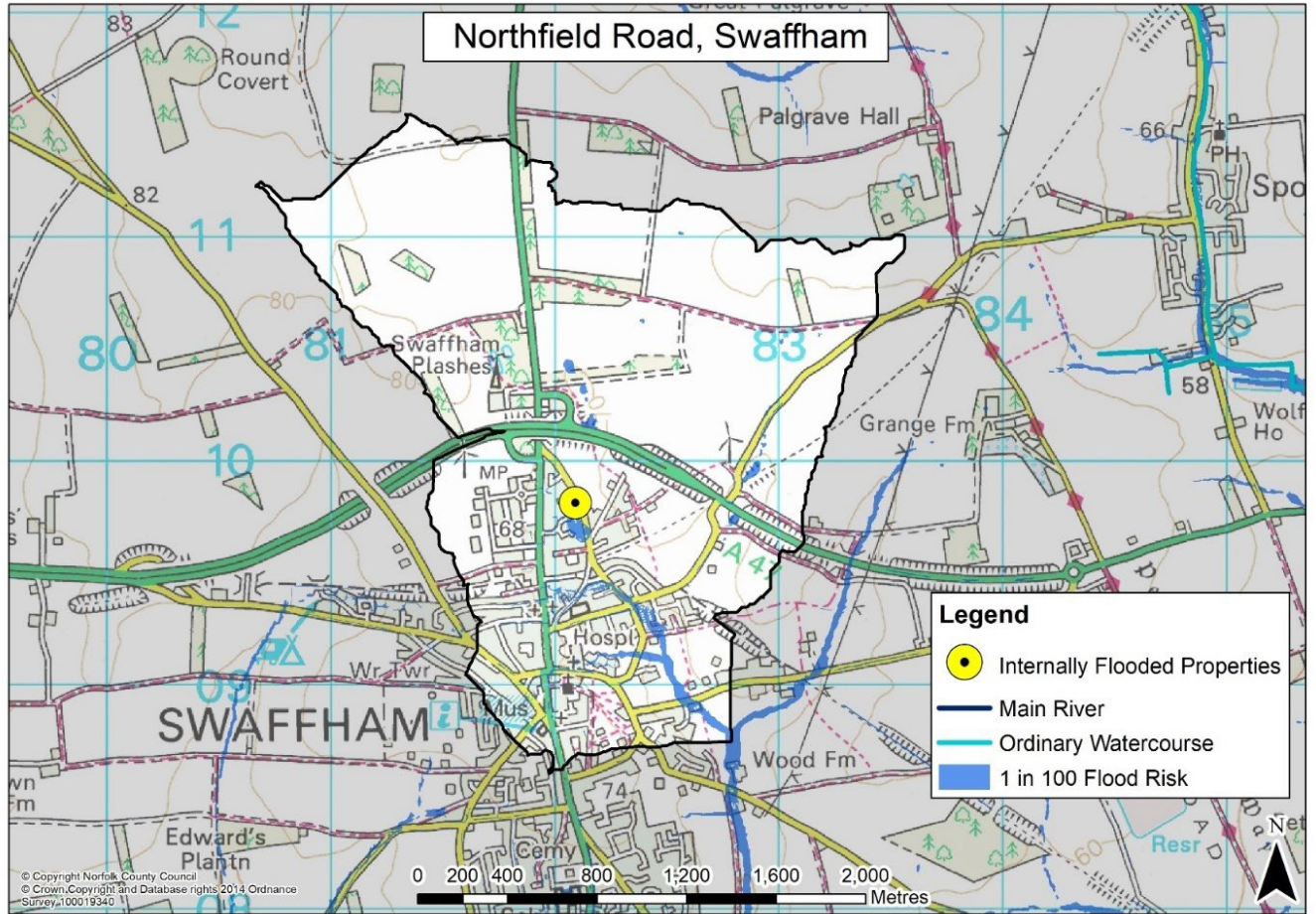
No historic internal flooding has been reported to Norfolk County Council (LLFA).

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Old Watton Road, Colney, 5 October 2021	Surface run-off from rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.	Norfolk County Council (Highways) should review the level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. This should include consideration of all Highways' assets contributing to the flooding.	Norfolk County Council (Highways)
Old Watton Road, Colney, 5 October 2021	Norfolk County Council provided a dropped kerb access for the property. Residents reported that the gullies were blocked during the construction works which allowed water to flow onto the property.	Norfolk County Council (Highways) should survey the drainage assets and review if any amendments are required to the new constructed access and drainage.	Norfolk County Council (Highways)
Old Watton Road, Colney, 5 October 2021	Loss of watercourse connecting to the main river	Property owner to liaise with The Environment Agency to re-establish the connection to the watercourse. Works in or near a main river or activities that could divert or obstruct flood water will require a Flood Risk Activity Permit. Environment Agency's East Anglian permitting team are contactable at ps0.eastanglia@environment-agency.gov.uk to determine whether a permit is required. A Flood Risk Activity Permit will assess whether all activities can take place without increasing flood risk, causing environmental harm, or impacting land drainage. Application forms and further information can be found on the government website	Property Owners Environment Agency

Breckland District Council
Flooding and Flood Risk within the Swaffham Area



Map of Swaffham Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
20 October 2021	On the 20 October 2021 one property was internally flooded on Northfield Road, Swaffham. This incident was reported by a resident via an online flood report form on the 31 October 2021, (FWF/21/5777).	Norfolk Fire and Rescue Service visited affected residents to offer advice and to gather information during the incident. Norfolk County Council (LLFA) assessed validity and impact of the flood report after the incident and visited affected residents to offer advice and to gather information after the incident. Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incident of flooding within this area.

Historic Flooding Incidents within the Area

The following table lists flooding incidents within the area that have been recorded.

Date of Incident	Impact	Rainfall Intensity
16 August 2020	Three properties reported internal flooding, two reported external flooding.	Heavy rain

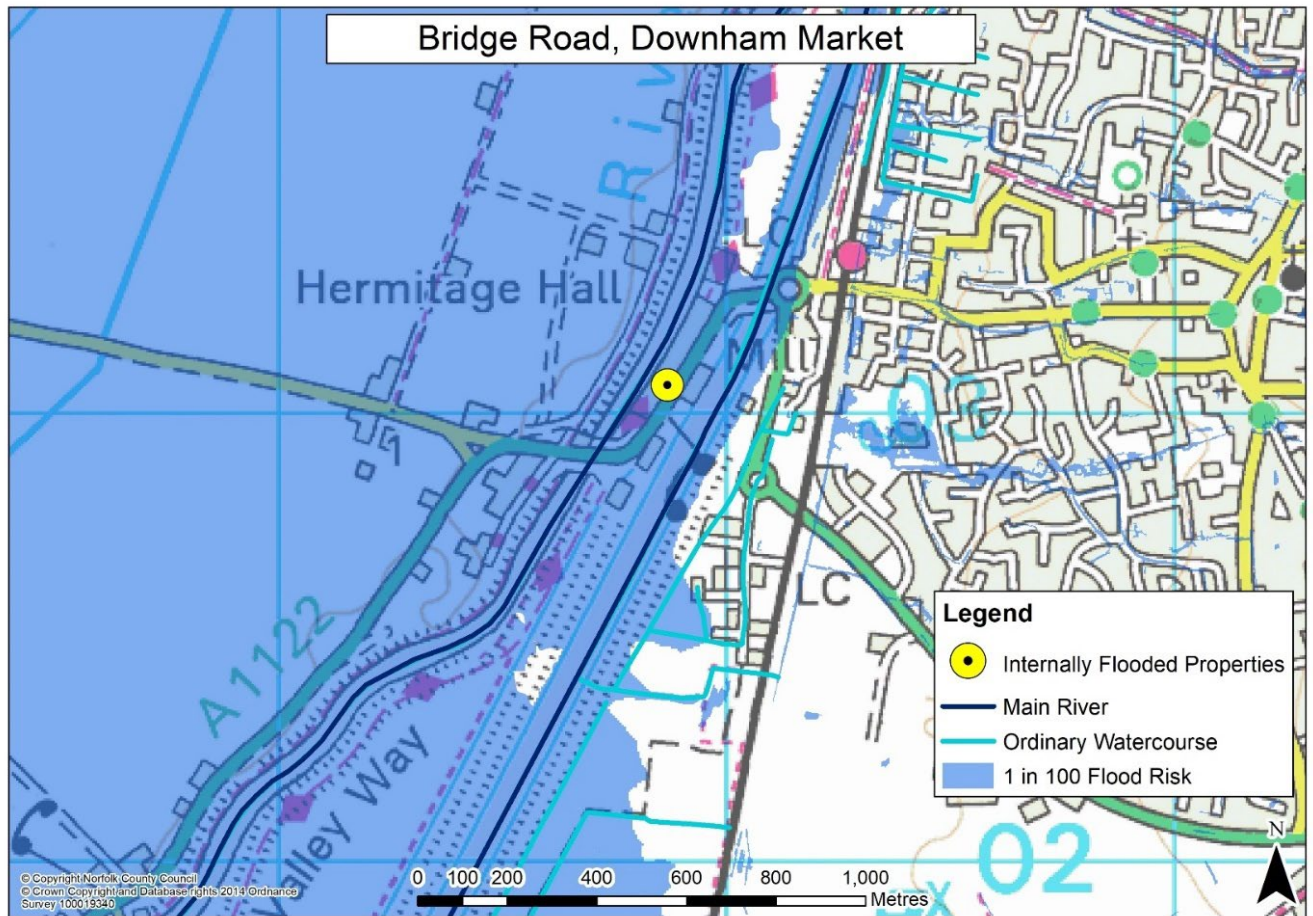
Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Northfield Road, Swaffham, 20 October 2021	Surface run-off from significant rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.	<p>Norfolk County Council (Highways) should consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable.</p> <p>Property owners to consider property level protection measure.</p> <p>Norfolk County Council (LLFA) to consider a bid for funding for a flood risk reduction scheme or property level protection measures.</p>	<p>Norfolk County Council (Highways)</p> <p>Property Owners</p> <p>Norfolk County Council (LLFA)</p>

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
<p>Northfield Road, Swaffham, 20 October 2021</p>	<p>Run-off from significant rainfall was directed towards the surface water and foul drainage networks. These flows could not be accommodated as the system was already overloaded and blocked with silt and debris. These systems surcharged elsewhere and directed flood water towards the affected property.</p>	<p>Norfolk County Council (Highways) and Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events. This could include a range of measures e.g., Anglian Water to investigate sealing manholes or using low-leak lids where safe to do so.</p> <p>Anglian Water to investigate and clear blockages within the foul system.</p> <p>Anglian Water to investigate foul sewer and private connections and consider non return valves where practical and where they do not increase risk elsewhere.</p>	<p>Anglian Water</p> <p>Norfolk County Council (Highways)</p>

Borough Council of King's Lynn and West Norfolk
Flooding and Flood Risk within the Downham Market Area



Map of Downham Market Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
1 October 2021	On the 1 October 2021 one property was internally flooded on Bridge Road, Downham Market. This incident was reported by a resident via a flood questionnaire on the 8 October 2021 (FWF/21/5668).	Norfolk County Council (LLFA) assessed validity and impact of the flood report after the incident and visited affected residents to offer advice and to gather information after the incident.

Recent Rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

The incident of internal flooding in this area is within 2.5km of a rain gauge. The rainfall data was shown to have a return period of less than one year. For a definition of return period please see Appendix A - Key Definitions and Responsibilities.

Historic Flooding Incidents within the Area

No historic internal flooding has been reported to Norfolk County Council (LLFA) at this location, however external flooding is known to have occurred in 2017 and 2020.

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and Date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
<p>Bridge Road, Downham Market, 1 October 2021</p>	<p>Surface run-off from significant rainfall made its way onto the highway and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.</p> <p>The surface water drainage system was partially obstructed by high water levels downstream, as a result of a high water table. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.</p>	<p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.</p>	<p>Property owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and Flood Risk within the Grimston Area



Map of Grimston Area.

Flood Incidents within this Area

Within this area one incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as Reported	Response to the Flood Incident
14 September 2021	On the 14 September 2021 one property was internally flooded on Low Road, Grimston. This incident was reported by a resident via email correspondence on the 16 August 2022, (FWF/22/6496)	Norfolk County Council (LLFA) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the Area

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the area that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council (LLFA) has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns; where there is no available data within this radius this will be stated.

The incident of internal flooding in this area is within 2.5km of a rain gauge. Analysis of the rainfall on the date of the flooding indicates a return period of between five and six years.

Historic Flooding Incidents within the Area

The following table lists flooding incidents within the area that have been recorded.

Date of Incident	Impact	Rainfall Intensity
16 August 2022	One property on Low Road confirmed as internally flooded.	Heavy rain
25 August 2022	One property on Low Road confirmed as internally flooded.	Heavy rain

Causes of Flooding within the Area and Recommendations

The findings of the investigation are detailed in the following table. The table details the causes that led to flooding within the area as well as when and where it was experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding as well as recommendations to mitigate the causes and impacts of the flooding experienced within this area.

Location and date of Flooding	Causes of Flooding	Recommendation	Risk Management Authority/ Individual with Relevant Flood Risk Roles
Low Road, Grimston, 14 September 2021	Rainfall was directed into the surface water system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property.	Norfolk County Council (Highways) should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events.	Norfolk County Council (Highways)
Low Road, Grimston, 14 September 2021	Surface run-off from significant rainfall made its way onto the highway and flowed along the road network and onto the access of the affected property situated lower than these features. Vehicles using the highway passed through the flood water causing it to wash towards the affected property.	Norfolk County Council (Highways) to consider opportunities to route flood water on the highway away from affected properties to alternative points of discharge, or other solutions as practicable.	Norfolk County Council (Highways)
Low Road, Grimston, 14 September 2021	Run-off from significant rainfall pooled at a low point within the area affecting the property.	Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) to communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait.	Property Owners Norfolk County Council (LLFA)

Disclaimer

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, it cannot be guaranteed that the contents will always be current, accurate or complete.

This report has been prepared as part of Norfolk County Council's responsibilities under 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 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.

The opinions, conclusions and any recommendations in this report are based on assumptions made by Norfolk 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.

Norfolk 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 Norfolk 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 the County Council highlighting flooding to properties at a street level.

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Appendix A - Key Definitions and Responsibilities

What is Flooding?

Section 1 of the Flood and Water Management Act 2010 states that: 'Flood' includes any case where land not normally covered by water becomes covered by water. In addition, this section adds the caveat:

"But 'flood' does not include –

- (a) a flood from any part of the sewerage system, unless wholly or partly caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system, or
- (b) a flood caused by a burst water main (within the meaning given by Section 219 of the Water Industry Act 1991)."

What is Internal and External Flooding?

For the purposes of this report, properties that have internally flooded are those where it is considered that water has entered the fabric of the building, where:

- a) Basements and below ground level floors are included.
- b) Garages are included if in the fabric of the building. Garages adjacent or separate from the main building are not included.
- c) Occupied caravans are included but not tents.

External flooding included those properties where water has entered gardens or surrounding areas which restricts access, affects the highway or where flooding has disrupted essential services to the property such as sewerage. For businesses this includes those where the flood waters are directly preventing them trading as usual.

What is Local Flood Risk?

Local Flood Risk is defined by the Flood and Water Management Act 2010 as being Flood risk from surface runoff, groundwater, and ordinary watercourses, where:

- a) 'Surface runoff' means rainwater (including snow and other precipitation) 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.
- b) 'Groundwater' means all water which is below the surface of the ground and in direct contact with the ground or subsoil.
- c) 'Ordinary watercourse' means a watercourse that does not form part of a main river and includes a reference to a lake, pond or other area of water which flows into an ordinary watercourse.

What is a Catchment?

Catchments reflect the reality that flooding does not respect the administrative boundaries of water management organisations. Hydrological catchments catch water and discharge it at locations known as outlets. Individual hydrological

catchment boundaries are usually formed by ridges of surrounding higher ground, which separate the lower lying areas at a line known as a watershed.

What is a Return Period?

A return period is the average length of time in years between events such as a particular amount of rainfall. Where rainfall data is available, we have calculated the return period to help us understand how frequently that event is likely to occur.

For example, a 1 in 100 year event would happen on average once every 100 years. This does not mean if an event occurs it will not happen for another 100 years. simply that this is the average interval between events.

Roles and Responsibilities of Risk Management Authorities

Below is a short summary of those groups and Risk Management Authorities (RMAs) that have a role in managing flooding within Norfolk. The listing of responsibilities includes those duties or powers that directly relate to managing the flood Incidents or consequence. All RMAs have a duty to cooperate with other RMAs.

1. Norfolk County Council (as Lead Local Flood Authority)

- a) Duty to investigate significant flooding from any source.
- b) Duty to maintain a register of structures or features which affect flood risk from all sources.
- c) Power to undertake works to manage flood risk from surface run-off and groundwater.
- d) Powers to regulate activities on ordinary watercourses outside of Internal Drainage Board areas.
- e) Duties as a Category 1 Responder for Emergency Planning and Norfolk Fire and Rescue Service.

2. District, City, and Borough Councils

- a) Powers to undertake works on ordinary watercourses outside of IDB areas.
- b) The Local Planning Authority for their District area and determine the appropriateness of developments and their exposure and effect on Flood risk.
- c) Duties as a Category 1 Responder for Emergency Planning.

3. Internal Drainage Boards (IDBs)

- a) A duty to act in a manner consistent with the national and local strategies and guidance when exercising FCERM functions.
- b) Duty to act in a manner consistent with Local Flood Risk Management Strategies when exercising other functions that may affect flood risk.
- c) Powers to regulate activities on ordinary watercourses within IDB areas.
- d) Exercise a general power of supervision over all matters relating to the drainage of land within their district.
- e) Powers to undertake works on ordinary watercourses within IDB areas.

4. Highway Authorities (Norfolk County Council / Highways England)

- a) Powers to undertake works to Manage water on the highway and to move water off the highway.
- b) Enforcement powers to unauthorised alterations, obstructions, and interferences with highway drainage.
- c) Have responsibilities for culverts vested in the highway. Currently NCC discharges its responsibilities associated with bridges and culverts (whether as owner or highway authority) through the inspection of condition (undertaken by the Bridges team) and through maintenance activity (delivered on a as needs basis by the relevant Highways area team).

5. Water Companies

- a) Undertake cost beneficial capital schemes to alleviate or eliminate flooding where the Flood event is associated with a failure of their assets.
- b) Duty to provide, improve, maintain, and operate systems of public sewers and works for the purpose of effectually draining an area.
- c) Are responsible for flooding from their foul, combined and surface water sewers, and from burst water mains.
- d) Maintain 'At Risk Registers' for Ofwat that record properties that have flooded from public foul, combined and surface water sewers and that are at risk of flooding again.
- e) Water companies respond to reports from the public of flooding associated with their assets and determine an appropriate response in line with their standards or customer service.
- f) Duties as a Category 2 Responder for Emergency Planning.

6. Riparian Owners

- a) Duty of care towards neighbours upstream and downstream, avoiding any action likely to cause flooding.
- b) Entitled to protect their properties from flooding.
- c) May be required to maintain the condition of their watercourse to ensure that the proper flow of water is unimpeded.

7. Environment Agency

- a) Powers to regulate Activities on Main Rivers.
- b) Permissive powers to undertake maintenance, however responsibility rests with riparian owners, any maintenance done under Environment Agency permissive powers is done on a risk based approach within the funding available.
- c) Power to undertake works to manage flood risk from main rivers.
- d) Required to have a strategic overview of all forms of Flooding.
- e) Enforcement powers for reservoirs greater than 25,000m³ and a duty to maintain a register of these reservoirs.
- f) Duties as a Category 1 Responder for Emergency Planning (including issuing flood warnings).