

Investigation Report into flooding across Great Yarmouth Borough during the summer of 2014



Report Reference: FWF/14/6/0672

19 June 2015

Report Status: Approved Report

	Name	Date
Prepared by:	Mark Henderson	19/06/2015
Checked by:	Mark Ogden	19/06/2015
Approved by:	Nick Johnson	19/06/2015

Investigation Report into flooding across Great Yarmouth Borough during the summer of 2014.

Contents

1. Disclaimer	3
2. Executive Summary	4
3. Justification for Flood Investigation	9
4. Rainfall events and data	11
(A) Hemsby Catchment	12
(B) Hemsby Beach Road Catchment	22
(C) Ormesby St Margaret Catchment	28
(D) Winterton Catchment	35
(E) Blocka Run Catchment	39
(F) Bradwell Catchment	43
(G) Claydon, Southtown and Cobham Catchment	48
(H) Pickerill Holme Catchment	52
(I) Northgate Catchment	56
(I) South Yarmouth	60
Appendix A - Key definitions and responsibilities	65

1. Disclaimer

- 1.1 Although every effort has been taken to ensure the accuracy of the information contained within this report, we cannot guarantee that the contents will always be current, accurate or complete.
- 1.2 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.
- 1.3 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.
- 1.4 The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, as well as, but not limited to, those key assumptions noted in the Report, including reliance on information provided by third parties.
- 1.5 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.
- 1.6 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.
- 1.7 Norfolk County Council forbids the reproduction of this report or its contents by any third party without prior agreement.

2. Executive Summary

- 2.1 Between early May and mid July 2014 a series of rainfall events caused 59 properties to flood internally within Great Yarmouth Borough. One event caused the greatest impact to people, property and infrastructure and occurred on the 27 June 2014 when 53 properties (90% of the total properties affected) were flooded internally.
- 2.2 This report has been drafted in response to these flood events. Its purpose is to determine the causes of the flooding and to identify those organisations that have a role in managing the incidents of flooding. It also recommends actions to reduce the impact or frequency of the flooding in the future.
- 2.3 The findings of this document have been produced in consultation with Great Yarmouth Borough Council, Norfolk County Council as Highways Authority, Broads (2006) Internal Drainage Board, Anglian Water and the Fire and Rescue Service. These organisations (except the Fire and Rescue Service) are all classed as Risk Management Authorities (“RMAs”) under the Flood and Water Management Act 2010. This status reflects their role in managing the flooding incidents mentioned within this report.
- 2.4 In response to the flood events the organisations mentioned above deployed services to provide assistance to the public. In some locations proactive investigations and remedial work has already been undertaken by Anglian Water, Norfolk County Council Highways and the Broads (2006) Internal Drainage Boards to identify issues, clear and repair surface water systems to ensure that residents are better protected from flooding.
- 2.5 The flooding that occurred between May and July 2014 impacted across a large area of Great Yarmouth Borough. To aid the investigation process and, for ease of presentation, the incidents of flooding have been grouped within this document based on hydrological catchments¹. The purpose of viewing flooding incidents based on catchments reflects the reality that flooding does not respect the administrative boundaries of water management organisations.
- 2.6 The key findings and recommendations are summarised below. More detailed or site specific recommendations are included later in the report on a catchment and street level basis. In summary the catchments we have identified are set out in table 1 below along with details the number of properties affected in each catchment as well as along with the dates they were affected:

¹ Hydrological catchments catch water (particularly rainfall) 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.

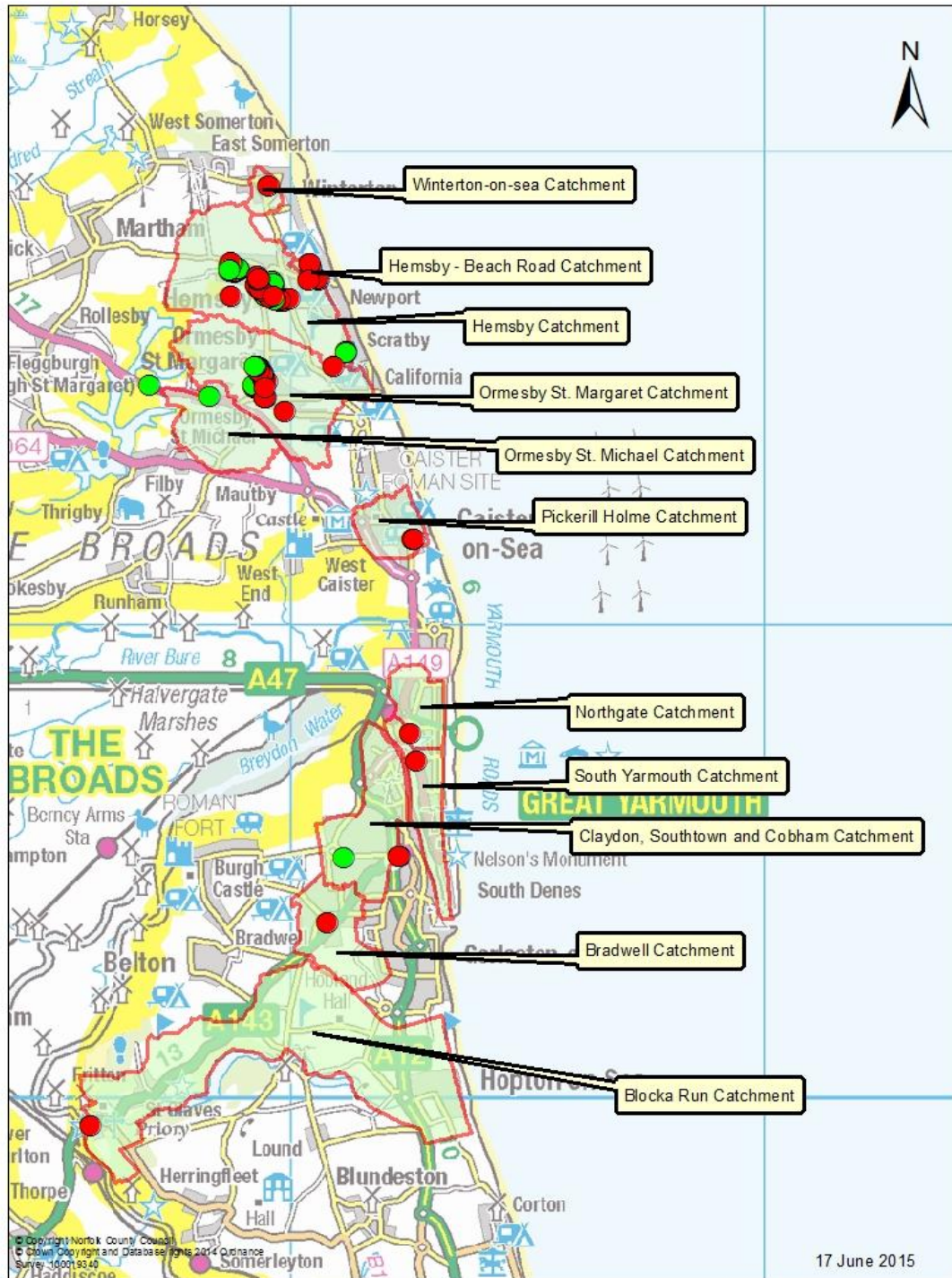
Table 1: No of properties flooded by catchment and event.

Catchment	No. of properties	Date of event
Hemsby	28	All 27 June 2014
Hemsby Beach Road	5	All 27 June 2014
Ormesby St Margaret	17	All 27 June 2014
Winterton	1	27 June 2014
Blocka Run	1	10 July 2014
Bradwell	1	13 July 2014
Pickerill Holme	4	2 on the 27 June 2014 1 on the 10 July 2014 1 on the 12 May 2014
Claydon-Southtown-Cobham	2	Both 13 July 2014
Total	59	

Table 2: No. of properties flooded by event

Date of event	No. of properties
12 May 2014	1
27 June 2014	53
10 July 2014	2
13 July 2014	3
Total:	59

Map1: Distribution of flooded locations



Spatial distribution of flooded locations within the catchments

Norfolk County Council

1:100,000

17 June 2015

Key Findings

- 2.7 The report has highlighted a number of factors that contributed to the flooding;
- a) A significant number of properties have flooded as they are located where the rainfall is naturally concentrated on flow paths and at low points. This concentration of water was exacerbated in some instances due to large areas of open land directing water towards settlements due to topography. In other cases by differences in land use such as the development of impermeable surfaces.
 - b) Some areas in which affected properties were located experienced localised extreme rainfall. Extreme events cannot reasonably be accommodated by the design standard of the local drainage systems.
 - c) Within some catchments surface water is managed by multiple organisations and individuals. The interaction between these systems and their differing capacities to deal with rainfall events led to them becoming overloaded. In some cases this was exacerbated by local circumstances such as;
 - the constriction of drainage systems experienced due to the build-up of sediment and fats, oils and grease.
 - a lack of connectivity in local drainage networks in part due to the loss of historic drainage features.
 - d) In some catchments external sewage flooding affected properties due to surface water ingress into the public sewer system.
 - e) A number of properties were affected by surface run-off that flowed off the highway via dropped kerbs.
 - f) A significant number of the properties that were flooded in 2014 had either been previously flooded in 2006 or were near to properties that had previously flooded. A number of properties within each settlement are also on the Anglian Water register of properties that have flooded in the last 5 years.
 - g) Anglian Water have improved some areas of their foul sewer network to improve the level of protection provided to properties that had flooded in previous years. This seemed to result in less internal sewer flooding being experienced during these rainfall events of 2014.
 - h) Norfolk County Council Highways have undertaken some surveys and cleansing of the highway drainage systems in response to the rainfall events in 2014.

Key Recommendations

- 2.8 The report has highlighted a number of recommendations that could, if implemented, reduce the frequency and impact of local flooding;
- a) It is recognised that the Internal Drainage Boards, NCC Highways and Anglian Water have maintenance programmes for their drainage systems and should review these programmes where there are known flooding issues.
 - b) Risk Management Authorities could work together to apply for funding to mitigate flood risk associated with their areas of responsibility. This could include large or small scale Sustainable Drainage Systems, flood routing, provision of alternative points of discharge and provision of property level protection.
 - c) Increase the number of rainfall gauges across the Great Yarmouth Borough Council area to ensure all areas of high risk have access to rainfall event data.
 - d) Share information (including mapping) between Risk Management Authorities to ensure that the responsibilities and capacity of multi-agency surface water; foul and combined systems are identified. This could include utilising updated surface water and catchment mapping across organisations to inform plans and projects
 - e) Local Planning authorities should work closely with the Lead Local Flood Authority, the relevant Internal Drainage Boards and Environment Agency to fully consider and incorporate lessons learnt from flood investigations in relation to proposed new development.
 - f) Risk Management Authorities/Emergency responders should:
 - Agree a definition as to when to call a 'surface water flood incident' an 'emergency' to help improve the response in terms of information sharing and quick coordination.
 - Agree, in conjunction with the Norfolk Resilience Forum, a clear process and protocol to deal with 'surface water emergency events' between organisations to ensure a coordinated approach.
 - Utilise updated surface water mapping and any other drainage plans to support emergency responders when dealing with 'surface water emergency events'.
 - g) Norfolk County Council as Lead Local Flood Authority should seek to highlight to the Insurance industry that in processing claims for those properties that are internally flooded in a rainfall event, that consideration and priority should be given to flood resilience measures to ensure that they and Norfolk's residents are better protected from future flood events.

3. Justification for Flood Investigation

3.1 It was deemed necessary to complete a formal investigation into the flood incidents that occurred across the Great Yarmouth Borough Council area from May to July 2014 as:

- a) Multiple residential properties were internally flooded
- b) Multiple commercial properties were internally flooded
- c) A school (classed by Defra as critical infrastructure) was internally flooded

3.2 This impact met Norfolk County Council's threshold for triggering the undertaking of a formal flood investigation. The criteria below is used by Norfolk County Council as a basis for determining whether the event has, or is likely to, increase flood risk and what the consequences of any increase in risk may be.

- Any risk to loss of life or serious injury
- One or more residential or business property flooded internally
- One or more Critical Services/Installations and Vulnerable Persons 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.
- 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.
- Flooding adversely impacting a rail link by making it impassable.

The purpose of the report

3.3 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.

3.4 The flood investigation report aims to:

- provide a transparent and consistent review of recent flooding
- identify those organisations and individuals who have responsibility to manage the causes of the flooding
- identify what their response has been or will be to the flooding
- make recommendations as to how the flood risk could be mitigated or reduced
- provide new evidence for the level of risk faced by communities in the Great Yarmouth Borough Council area,

which can be used in current funding bids for flood mitigation schemes

- 3.5 Mitigation measures include property level protection: reinstating lost drainage features: reviewing or increasing maintenance regimes and increasing the capacity of the drainage network.
- 3.6 It is the intention of the Lead Local Flood Authority to monitor the progress of Risk Management Authorities in meeting the recommendations of this report. As such, we will publish an addendum, a year after publication of this report, which will outline the actions undertaken by Risk Management Authorities to better protect residents and properties in the flooding locations identified within this report.

4. Rainfall events and data

- 4.1 A large number of rainfall events fell across the County of Norfolk between late May and late November 2014. These include events that led to the internal flooding of properties in the East of the county that occurred on the 12 May, 27 June, 10 July and 13 July 2014. Significant numbers of properties were impacted by the event on the 27 June rainfall event. The 27 June event is analysed in more detail in the paragraphs below;
- 4.2 a) On the 27 June 2014 in Ormesby St Margaret 32.2mm was recorded as falling in 30 minutes by **the Ingham Radar station**. The intensity of rainfall for this duration equates to a 1: 146 year rainfall event. For a 1 hour return period this equates to a 1:56 year event².
- b) On the 27 June 2014 in Hemsby 18.8mm was recorded as falling in 30 minutes by **the Ingham Radar station**. The intensity of rainfall for this duration equates to a 1: 15 year rainfall event. For a 1 hour return period this equates to a 1:12 year event³.
- 4.3 Data from rain gauges is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas were exceeded. However, of the 59 properties, 57 of these were outside of the operating range of rainfall gauges. Of those that were within the operating range of a rainfall gauge, which were in the Pickerill Holme Catchment, the results did not show that the rainfall event was a significant event.
- 4.4 The figures from the Ingham Radar Station, as detailed above, should be treated as a broad picture of the rainfall event but it does not reflect the detail of localised summer rainfall events. A greater level of accuracy can be gained where a rain gauge is located within 2.5km of affected properties and in line with British Standards.

² Calculated using the Flood Estimation Handbook DDF event rarity over 1km grid square for the rain gauge location.

³ Calculated using the Flood Estimation Handbook DDF event rarity over 1km grid square for the rain gauge location.

(A) Hemsby Catchment

1. General Description The Hemsby catchment flows West from the higher, predominately rural, ground to the North, East and South of the village. Two main flow paths converge near the junction of Yarmouth Road and The Street. The third flows North to South across Martham and Common Roads. All discharge into Ormesby Broad through a series of land drains.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
24 properties	76 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment is listed below; (please see Map 2 for approximate locations of incidents within the catchment).
 - (a) **Common Road** - 1 property was internally flooded on Common Road⁴. This property was flooded on the 27 June 2014 rainfall event. This incident was reported by Great Yarmouth Borough Council.
 - (b) **Hall Road** - 1 property was internally flooded on Hall Road⁵. This property was flooded on the 27 June 2014. This incident was reported directly to the Lead Local Flood Authority.
 - (c) **Haycroft** - 2 properties were internally flooded on Haycroft⁶. These properties were flooded on the 27 June 2014. These incidents were reported by the Fire and Rescue Service and Great Yarmouth Borough Council.
 - (d) **Martham Road** - 1 property was internally flooded on Martham Road⁷. This property was flooded on the 27 June 2014. This incident was reported both directly to the Lead Local Flood Authority and by the Fire and Rescue Service. Other householders in Martham Road also experienced significant external flooding but did not flood internally.

⁴ Email correspondence with Great Yarmouth Borough Council 4 July 2014. Flood questionnaire (961) received on 14 August 2014.

⁵ Property owner 2014 pers. comms. 24 September 2014 (1048)

⁶ Email correspondence from Great Yarmouth Borough Council 30 June 2014 and Fire and Rescue Service Report 12 July 2014. Flood questionnaires for case files 1052, 1053 & 1054 received on 10, 15 and 18 Aug 2014.

⁷ Reported directly to the LLFA. Flood questionnaire 1078 received on 9 August 2014.

- (e) **Newport Road** - 8 properties were internally flooded on Newport Road⁸. These properties flooded on the 27 June 2014. These incidents were reported by the Fire and Rescue Service and Great Yarmouth Borough Council. Other householders also experienced significant external flooding but did not flood internally. Adjacent to these properties was a new development site that also flooded on the 27 June 2014. This development was approved for planning on the 28 February 2013 with conditions which were discharged on the 20 March 2015 and building had commenced at the time of the rainfall event. In December 2014 concerns were expressed by Borough Council officers that there was still a surface water risk to the new development.
- (f) **Yarmouth Road** - 4 properties were internally flooded on Yarmouth Road⁹. These properties were flooded on the 27 June 2014. These were reported by the Fire and Rescue Service and Great Yarmouth Borough Council. Other householders also experienced significant external flooding but did not flood internally.
- (g) **Beach Road, Hemsby** – Buildings within 1 business were internally flooded on Beach Road¹⁰. These buildings were flooded on the 27 June 2014. This incident was reported by Great Yarmouth Borough Council.
- (h) **Ormesby Road** – 2 properties were internally flooded on Ormesby Road¹¹. These properties were flooded on the 27 June 2014. These incidents were reported by Great Yarmouth Borough Council and directly to the Lead Local Flood Authority.
- (I) **The Street** – 4 properties were internally flooded on The Street¹². These properties were flooded on the 27 June 2014. This incident was reported by Great Yarmouth Borough Council and a resident.
- (J) **School Loke** - 1 property was internally flooded on School Loke¹³. This property was flooded on the 27 June 2014. This incident was reported by a resident.
- (k) **Ferrier Court** – 1 property was internally flooded on Ferrier Court. This property was flooded on the 27 June 2014 rainfall event. This incident was reported by the Fire and Rescue Service¹⁴.

⁸ Report by Great Yarmouth Borough Council in a visit to properties on the day of the flooding (1079, 1084, 1085, 1086, 1279, 1282, 1284 & 1285). Questionnaires received for case files 1084, 1085 and 1086.

⁹ Email correspondence with Great Yarmouth Borough Council 4 July 2014 and the Fire and Rescue Service Report 5 July 2014 (1286 and 1094). Flood questionnaires for case files 1095 and 1098

¹⁰ Email correspondence with Great Yarmouth Borough Council 4 July 2014 (1287) and with NCC Resilience Manager on the 19 May 2015 (1287).

¹¹ Email correspondence with Great Yarmouth Borough Council 4 July 2014 and Fire and Rescue Service Report 5 July 2015 and article in Great Yarmouth Mercury June 28, 2014 'MP visits flood-hit Norfolk Communities as clean up begins'. Flood Questionnaire (1087).

¹² Email correspondence with Great Yarmouth Borough Council 10 February 2015 and Pers. comms. 14 May 2015 (1317). Flood Questionnaires for case files 1317, 1323 and 1324.

¹³ Pers. comms. 14 May 2015 reported flooding to property (1317). Flood questionnaire (1) with adjacent resident

¹⁴ Flood Questionnaire for case file 1051 and Fire and Rescue Service Report 5 July 2014.

- (L) **Beach Road, Ormesby St Margaret with Scratby** - 2 properties were internally flooded on Beach Road, Ormesby St Margaret with Scratby¹⁵. These properties were flooded on the 27 June 2014. This incident was reported by the Fire and Rescue Service.

4. Desk Study

The flooding incidents within this catchment are;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Associated with significant overland flow path(s).
- Outside Flood Zones 2 & 3.
- Situated within an area of geology likely to have good rates of infiltration.
- Near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to be served by public foul and surface water sewers.
- Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Located near to old drainage features highlighted by historic mapping and there are old wells and ditches indicated on the map.
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- Locations that include a number of properties that have experienced internal flooding before
- Associated with properties already included on the Anglian Water Flooding register and are also near to other properties that did not get flooded in this event.
- In locations that are mentioned in previously published flood studies or reports and are included in the Gt Yarmouth SWMP.

5. Responsibilities

From the desk study it is indicated that the management of local drainage is primarily the responsibility of Anglian Water, NCC Highways and property, riparian and land owners. It also should be noted that The Broads (2006) Internal Drainage Board have a role to play in maintaining a main drain that receives surface water from the surface water systems that serve a number of the affected properties.

¹⁵ Fire and Rescue Service Report (1320 & 1326)

6 Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ¹⁶
<p>Hemsby Catchment</p> <p>Hall Road</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is adjacent to.</p> <p>[C6] The private surface water drainage system outfall was partially obstructed by debris or silt. This caused the failure of the upstream drainage system contributing to the accumulation of surface water flood water at the affected property.</p> <p>[C7] Run-off from significant rainfall was directed into the private surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p>	<p>Property owner for causes [C6] and [C7].</p>	<p>The property owner has cleared drains that discharge into the watercourse and has cleared the watercourse to its confluence with the IDB main drain. This has duly increased the capacity of the receiving watercourse.</p>	<p>[R5] The property owner should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.</p> <p>[R10] The property owner should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e. tree leaves / roots) at all times.</p>
<p>Common Road</p> <p>Haycroft</p>	<p>[C1] On Martham Road, Common Road, Newport Road and the bottom of Yarmouth Road run-off from significant rainfall was concentrated at a low point within the catchment in the vicinity of which the affected properties are</p>	<p>NCC Highways and property owners for causes [C4] and NCC Highways for [C5], [C6] and [C7]</p>	<p>Great Yarmouth Borough Council officers attended on the 27 June 2014 and offered support and temporary accommodation to those in need. The Borough Council also</p>	<p>[R1] Authorities to identify structures or features that have an effect on local flood risk within Newport Road, Yarmouth Road and Common Road in order to;</p>

¹⁶ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

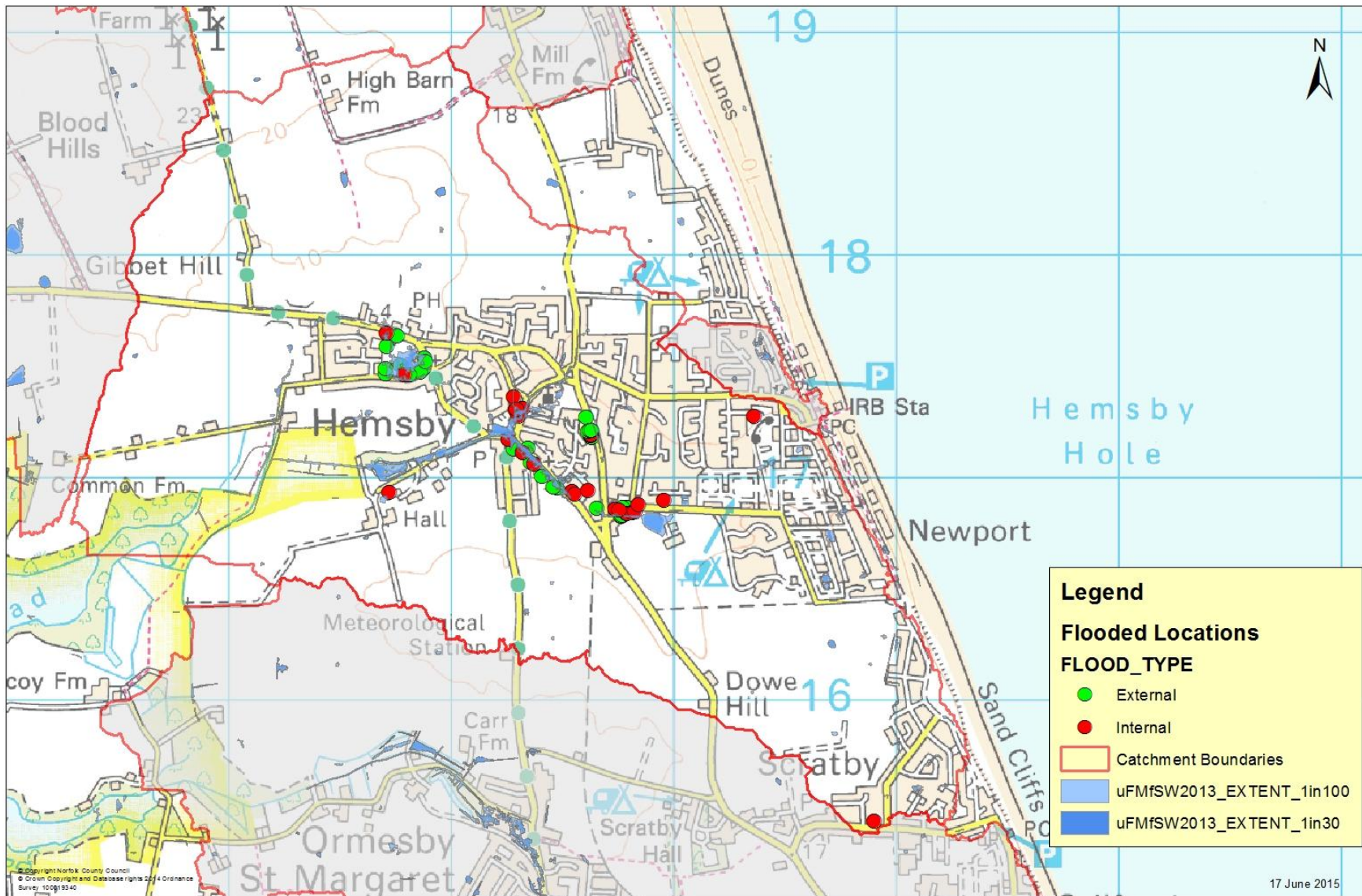
<p>Martham Road</p> <p>Newport Road</p> <p>Yarmouth Road</p> <p>Ormesby Road</p> <p>School Loke</p> <p>The Street</p>	<p>positioned.</p> <p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected properties are positioned.</p> <p>[C4] On Martham Road, Common Road Water, Newport Road and Yarmouth Road water was found to flow from the highway by dropped kerbs/ the camber of the road adjacent to the property access and concentrated flood water in the vicinity of the affected properties.</p> <p>[C5] Significant rainfall and surface water runoff was concentrated on the highway. Some vehicles using the highway passed through the flood water causing it to wash on to/towards the properties.</p> <p>[C6] The capacity and route of the drainage system serving Martham Road is known although the condition of the highway drainage system on Martham Road is unknown.</p> <p>[C7] Run-off from significant rainfall was directed into the surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p> <p>The above causes were exacerbated by:</p> <p>[C] The loss of historic drainage features</p>		<p>worked with the Eastern Daily Press to offer emergency grants to those affected by the flooding</p> <p>The Fire and Rescue Service pumped out properties in Newport Road, Yarmouth Road and Haycroft.</p> <p>Anglian Water:</p> <ul style="list-style-type: none"> • Attended on 27 June 2014 and tested for the presence of sewage within the flood water at a number of properties. There was no evidence of internal sewage flooding of the properties affected. • Visited Newport Road and found that the sewer was full of stones and caused a blockage • Jetted the manhole in Martham Road and removed fats, oils and grease from the drainage system adjacent to the flooding location. <p>Norfolk County Council Highways have:</p> <ul style="list-style-type: none"> • Placed additional gullies outside the properties affected in Newport Road. • Jetted and cleaned surface water system in The Street, Yarmouth Road and Newport Road and assessed all gullies which were clear of silt 	<ul style="list-style-type: none"> • establish an overview of the drainage and watercourse systems in the affected area • allow for quicker identification of the responsible authority in incidences of flooding. <p>Where structure or features are associated with significant flood risk these will be included on Norfolk County Council's public register. This will provide transparency for residents as to ownership and condition.</p> <p>[R4] The Lead Local Flood Authority and NCC Highways could determine the integrity and capacity of the highway surface water system to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.</p> <p>[R8] Based on investigations into the capacity of the drainage system, NCC Highways could consider the feasibility for a capital drainage schemes in the medium to long term for Newport and Yarmouth Rd to improve and/or link 'the road' surface water drainage system into an alternative positive drainage system.</p>
---	---	--	--	--

	<p>within the catchment. Specifically this relates to the loss of a watercourse culvert.</p> <p>[H] Due to large areas of adjacent impermeable surfaces this caused water run-off to be directed quickly from where it fell as rain to the areas of flooding.</p> <p>[I] The height of Kingsway bisected a flow path which caused water to accumulate in properties adjacent to Newport Road.</p>		<ul style="list-style-type: none"> • Contacted landowner with regards to the management of the land and installation of attenuation close to the affected areas in Yarmouth Road. <p>On Haycroft and Newport Road property owners have undertaken property level protection measures. This was in response to both a previous flood event in 2006 and the event on the 27 June 2014.</p> <p>On Martham Road the adjacent landowner has created a flood water attenuation area in the field opposite the affected property.</p>	<p>[R9] NCC Highways could review the existing level of maintenance required to sustain the design efficiency of their drainage systems that serves the flooding locations. These works could then be prioritised as part of NCC Highways maintenance programmes. This work could also be coordinated between organisations including the Broads (2006) IDB where there is an interaction between their responsibilities for the drainage systems.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p> <p>[R13] RMAs and riparian owners to determine the appropriate maintenance regime in line with the risk identified. This could include the coordination of any future capital or maintenance programmes.</p> <p>[R14] The Lead Local Flood Authority could work with other Risk Management Authorities (RMAs) to seek a partnership funding solution to mitigate the risk experienced at these locations. This could be either</p>
--	---	--	---	---

				<p>through submission of a bid to secure Partnership funding or through negotiation with RMAs and the local community. It is important to note this recommendation will be subject to the priorities and availability of resources of funders. It may be dependent on those property owners affected contributing towards a solution.</p> <p>[R17] The Local Planning Authority should seek potential drainage improvements through the approval of planning applications within the local catchment. The evidence and lessons learnt from past flooding and drainage surveys need to be incorporated into any possible drainage strategy identified for the proposed development. These will, where appropriate, be provided by the relevant RMA (e.g. Environment Agency) as part of the planning application consultation process and through more detailed discussions between RMAs and developers.</p> <p>[R28] The adjacent landowner(s) in Yarmouth Road and Martham Road could implement appropriate land management techniques e.g.</p>
--	--	--	--	--

				<p>ploughing direction to reduce the surface water run-off.</p> <p>[R29] Norfolk County Council as Lead Local Flood Authority could work with adjacent landowners to identify the potential for providing or increasing attenuation in Martham and Newport Road to reduce the amount of surface water entering drainage systems.</p>
<p>Beach Road, Hemsby</p>	<p>[C7] Run-off from significant rainfall was directed into the surface water systems. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected properties.</p> <p>The above causes were exacerbated by:</p> <p>[B] The structure of the affected properties was not able to withstand the impacts of flood water. As such flood water entered the property through low thresholds at entrances.</p>	<p>Property owner for causes [C7].</p>	<p>It is not known what actions were taken by the property owners affected.</p>	<p>[R5] The property owner should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.</p>
<p>Beach Road, Ormesby St. Margaret with Scratby</p>	<p>[C4] Water was found to flow from the highway by dropped kerbs/ the camber of the road adjacent to the property access concentrating flood water in the vicinity of the affected properties.</p>	<p>NCC Highways and property owners for cause [C4] and NCC Highways for cause [C7].</p>	<p>NCC Highways:</p> <ul style="list-style-type: none"> assessed the gully chambers along Beach Road and these were clear of silt contacted landowner to require the maintenance of 	<p>[R8] Based on investigations into the capacity of the drainage system, NCC Highways could consider the feasibility for a capital drainage scheme in the medium to long term to improve</p>

	<p>[C7] Run-off from significant rainfall was directed into the surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p> <p>[C5] Significant rainfall and surface water runoff was concentrated on the highway. Some vehicles using the highway passed through the flood water causing it to wash on to/towards the properties.</p>		<p>the ditch (outfall) from which the highway drainage outfalls into</p> <p>Property owner has taken property level protection measures.</p>	<p>and/or link 'the road' surface water drainage system into an alternative positive drainage system.</p> <p>[R9] NCC Highways could review the existing level of maintenance required to sustain the design efficiency of their drainage systems that serves the flooding locations. These works could then be prioritised as part of NCC Highways maintenance programmes.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p> <p>[R13] RMAs and riparian owners to determine the appropriate maintenance regime in line with the risk identified. This could include the coordination of any future capital or maintenance programmes</p> <p>[R25] NCC Highways could assess and amend the road structure to route flood water away from the affected properties to alternative points of discharge.</p>
--	---	--	--	--



Hemsby Catchment

Map 2

(B) Hemsby Beach Road Catchment

1. General Description This small catchment, partly made up of built over dunes, flows generally West to East.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
9 properties	24 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 3 for approximate locations of incidents within the catchment).

- (a) **Beach Road** - 2 properties were internally flooded on Beach Road¹⁷. These properties were flooded on the 27 June 2014. These incidents were reported by Great Yarmouth Borough Council and by the Fire and Rescue Service. Other properties were externally flooded on this road¹⁸.
- (b) **The Glebe** - 4 properties were internally flooded on The Glebe¹⁹. These properties were flooded on the 27 June 2014. These incidents were reported by the Fire and Rescue Service and directly to the Lead Local Flood Authority.

4. Desk Study The flooding incidents within this catchment are;
 - Located within the Great Yarmouth Borough Council administrative boundary.
 - Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
 - Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
 - Associated with significant pooling or ponding.
 - Outside Flood Zones 2 & 3.
 - Situated within an area of geology likely to have good rates of infiltration.
 - Not near to NCC inspected structures recorded on the NCC Bridges layer.
 - Shown by Anglian Water records to only be served by public foul water sewers.
 - Is adjacent to an unadopted private road and no highway drainage features are visible on Street View.
 - Not located near to old drainage features highlighted by historic mapping and there are no further comments to add.
 - Not within 2.5km of a rain gauge
 - Not associated with flooding from ordinary watercourses or

¹⁷ Email correspondence with Great Yarmouth Borough Council 4 July 2014 (1288, 1303) and with per. comms with adjacent business (1288) on the 26 May 2015.

¹⁸ Case file reference 1289.

¹⁹ Fire and Rescue Service Report 5 July 2015. Flood Questionnaires for case files 1090, 1091, 1092 & 1293.

main rivers.

- Locations that have experienced internal flooding before
- Near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and was mentioned in the Gt Yarmouth SWMP

5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of Anglian Water, NCC Highways and property, riparian and land owners.

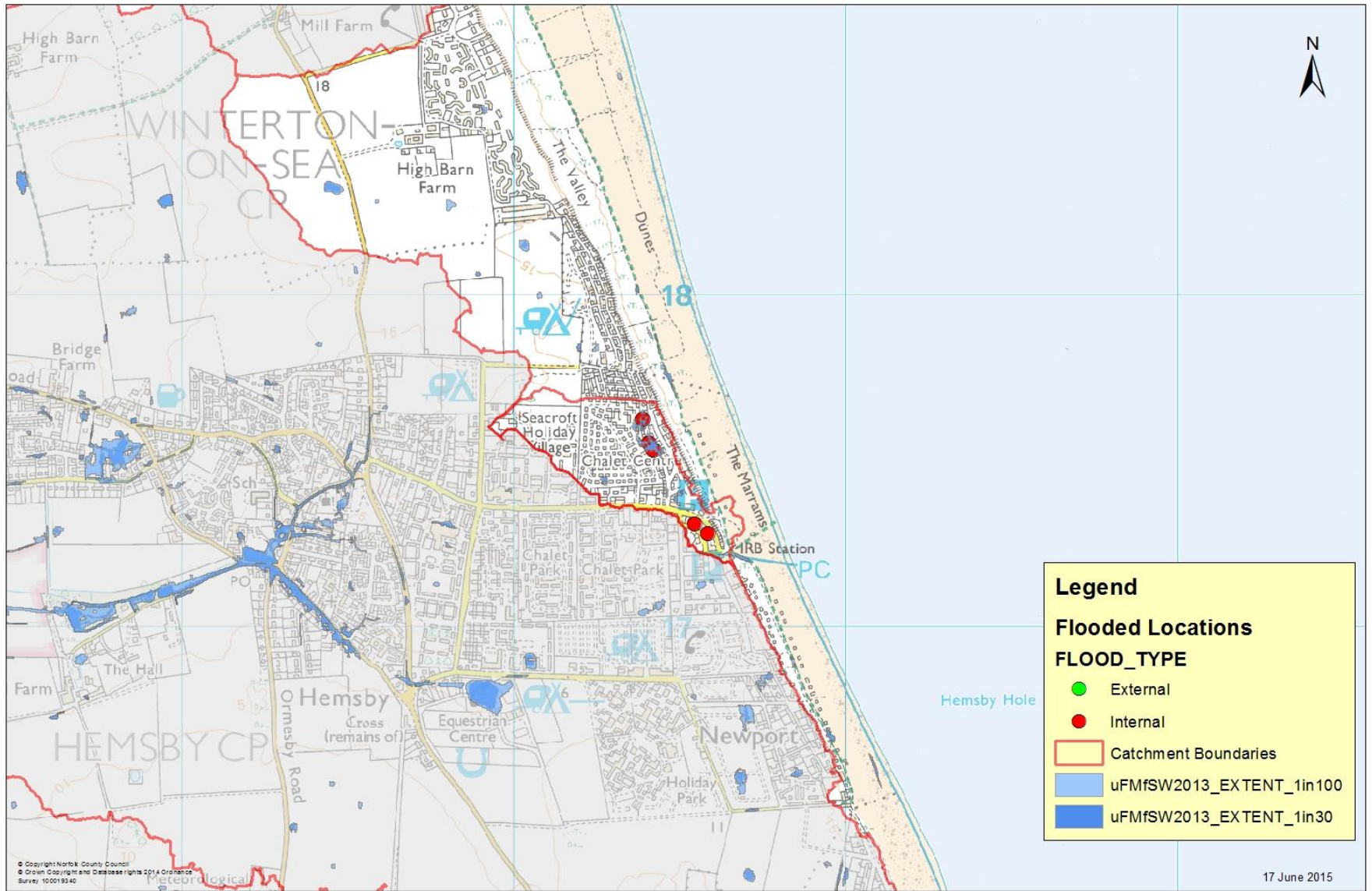
6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ²⁰
<p>Hemsby Beach Catchment</p> <p>Beach Road</p>	<p>[C11] Water was directed from the neighbouring properties roof which concentrated flood water towards the affected property.</p>	<p>Individual property owner.</p>	<p>Property owner has not taken any property level protection measures.</p>	<p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p>
<p>The Glebe</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected properties are positioned.</p> <p>[C10] Due to impermeable surfaces / localised ground conditions caused water run-off to be directed quickly from where it fell as rain to the areas of flooding.</p> <p>The above causes were exacerbated by:</p> <p>[G] Drainage on unadopted roads remain in private ownership and has insufficient capacity and therefore cannot cope with significant rainfall events.</p>	<p>Adjacent landowner for cause [C10].</p> <p>Property owner for causes [G].</p>	<p>Property owners have taken property level protection measures</p> <p>Anglian Water have installed a pump in one of the affected properties in relation to previous foul sewer flooding to the property.</p>	<p>[R1] Norfolk County Council could work with Risk Management Authorities to identify structures or features that have an effect on local flood risk within The Glebe in order to;</p> <ul style="list-style-type: none"> • establish an overview of the drainage and watercourse systems in the affected area • allow for quicker identification of the responsible authority in incidences of flooding. <p>Where structure or features are associated with significant flood risk these will be included on Norfolk County Council's public register. This will provide</p>

²⁰ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

				<p>transparency for residents as to ownership and condition.</p> <p>[R4] The property owners could determine the wider systems integrity and/or capacity to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p> <p>[R14] The Lead Local Flood Authority could work with other Risk Management Authorities (RMAs) to seek a partnership funding solution to mitigate the risk experienced at these location. This could be either through submission of a bid to secure Partnership funding or through negotiation with RMAs and the local community. It is important to note this recommendation will be subject to the priorities and availability of resources of funders. It may be dependent on those property owners affected contributing towards a solution.</p>
--	--	--	--	--

				<p>[R29] Norfolk County Council as Lead Local Flood Authority could work with adjacent landowners to identify the potential for providing or increasing attenuation on the upstream property to reduce the volume of water directed towards the affected properties.</p>
--	--	--	--	---



Hemsby - Beach Road Catchment

Map 3

(C) Ormesby St Margaret Catchment

1. General Description The Ormesby St Margaret catchment flows West and North-West from the higher, predominately rural, ground to the North, East and South of the village. The main flow path follows North Road, Private Road and Decoy Road, discharging into Ormesby Broad through a series of land drains.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
85 properties	177 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment is listed below; (please see Map 4 for approximate locations of incidents within the catchment).
 - (a) **Chimney Springs** - 1 property was internally flooded on Chimney Springs²¹. This property was flooded on the 27 June 2014. This incident was reported by Great Yarmouth Borough Council.
 - (b) **Decoy Road** - 1 property was internally flooded on Decoy Road²². This property was flooded on the 27 June 2014. This incident was reported by Great Yarmouth Borough Council.
 - (c) **North Road** – 8 properties were internally flooded on North Road²³. These properties were flooded on the 27 June 2014. These incidents were reported by Great Yarmouth Borough Council, the Fire and Rescue Service, Anglian Water and directly to the Lead Local Flood Authority.
 - (d) **Private Road** - 2 properties were internally flooded on Private Road²⁴. These properties were flooded on 27 June 2014. These incidents were reported by Great Yarmouth Borough Council and Anglian Water.
 - (e) **The Oaks** - 3 properties were internally flooded at The Oaks, Wapping²⁵. These properties were flooded on the 27 June 2014. These incidents were reported by Great Yarmouth Borough Council and Anglian Water.

²¹ Email correspondence with Great Yarmouth Borough Council 4 July 2014 (1291) and Pers. Comms. with resident.

²² Email correspondence with Great Yarmouth Borough Council 4 July 2014 and Flood Questionnaire (1111).

²³ Email correspondence with Great Yarmouth Borough Council 4 July 2014 and Anglian Water Report (1114, 1115, 1295, 1296, 1313 and 1322). Flood Questionnaires (1114, 1115, 1116 and 1258)

²⁴ Email correspondence with Great Yarmouth Borough Council 4 July 2014 and Anglian Water report (1201). Flood questionnaire (1117). Anglian Water report for June/July/August 2014.

²⁵ Email correspondence with Great Yarmouth Borough Council 4 July 2014 (1120, 1297 & 1298). Flood questionnaire (1120)

- (f) **Nova Scotia Road** - 1 property was internally flooded on Nova Scotia Road²⁶. This property was flooded on the 27 June 2014. This incident was reported by the Fire and Rescue Service.

4. Desk Study

The flooding incidents within this catchment are;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Associated with significant overland flow path(s).
- Outside Flood Zones 2 & 3.
- Situated within an area of geology likely to have good rates of infiltration.
- Near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to be served by public foul and surface water sewers.
- Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Located near to old drainage features highlighted by historic mapping and there are numerous old watercourses and ponds now filled in.
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- Locations that have experienced internal flooding before
- Near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and included in Stage 1 of the Gt Yarmouth SWMP.

5. Responsibilities

From the desk study it is indicated that the management of local drainage is primarily the responsibility of Anglian Water, NCC Highways and property, riparian and land owners. It also should be noted that the Broads (2006) Internal Drainage Board have a role to play in maintaining an en-mained watercourse that receives surface water from the surface water systems that serve a number of the affected properties.

²⁶ Fire and Rescue Service Report 26 July 2014 (1321)

6. Investigation Findings

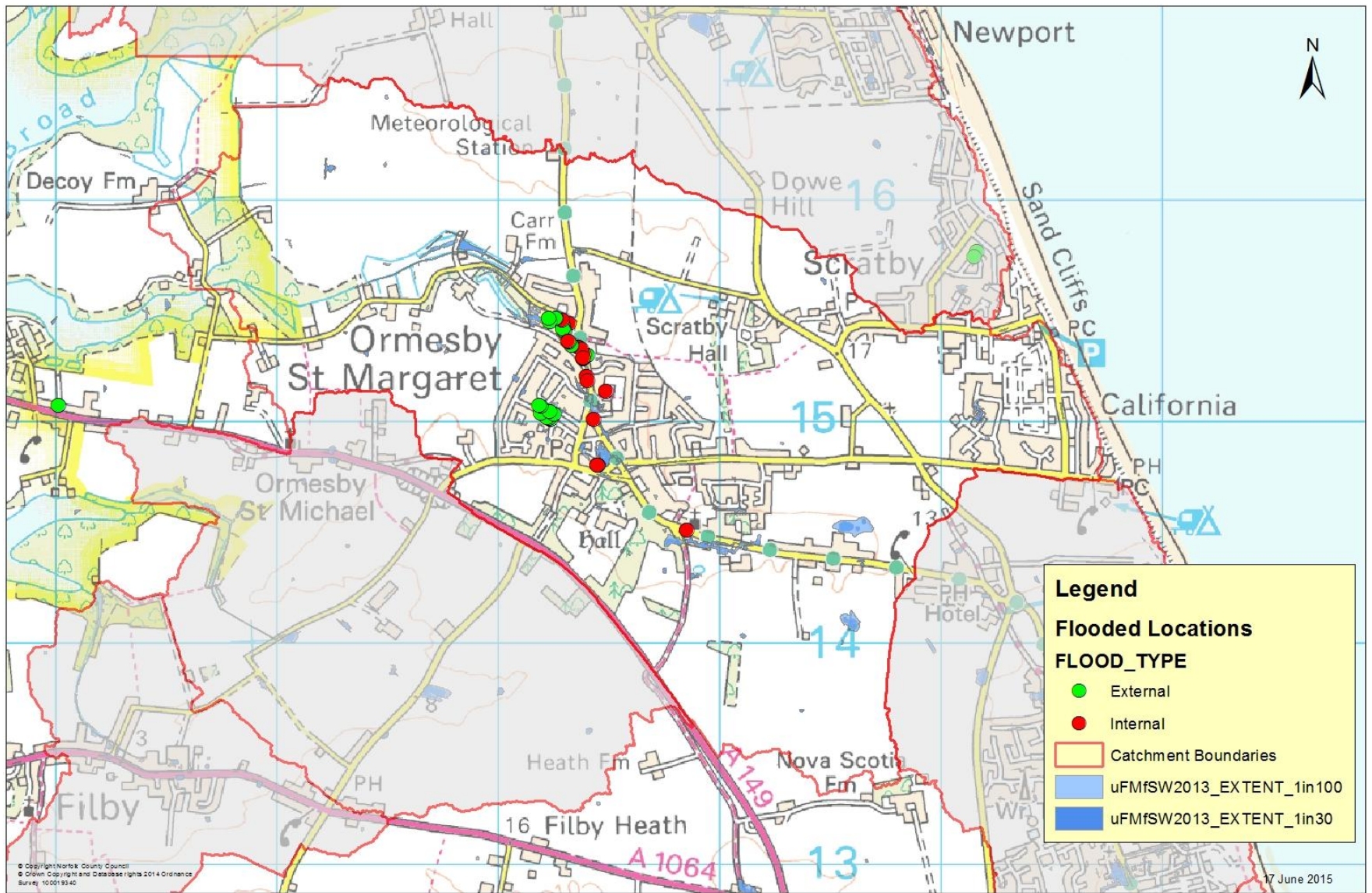
Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ²⁷
<p>Ormesby St Margaret Catchment</p> <p>Chimney Springs</p> <p>Decoy Road</p> <p>North Road</p> <p>Private Road</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected properties are positioned.</p> <p>[C4] Water was found to flow from the highway by dropped kerbs on Chimney Springs, Decoy Road and Private Road adjacent to the property access and concentrated flood water in the vicinity of the affected properties.</p> <p>[C7] Run-off from significant rainfall was directed into the highways and Anglian Water surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected properties.</p> <p>The above causes were exacerbated by:</p> <p>[D] The loss of historic drainage features within the Chimney Springs and Decoy Road. Specifically this relates to the loss of a pond serving the site location.</p>	<p>NCC Highways, Anglian Water for cause [C4] and NCC Highways and Anglian Water for cause [C7]</p>	<p>NCC Highways</p> <ul style="list-style-type: none"> • jetted and cleaned surface water system in Decoy Rd and in North Road and assessed all gullies. • installed road humps in front of properties and are considering additional gullies in Private Road to reduce surface water run-off from the Highway. <p>Anglian Water attended on 27 June 2014 and tested for the presence of sewage within the flood water. There was no evidence of internal sewage flooding of the properties affected and where there was evidence of external sewage Anglian Water attended and cleansed.</p> <p>Great Yarmouth Borough Council attended on the 27 June and offered support and temporary accommodation to</p>	<p>[R1] Authorities to identify structures or features that have an effect on local flood risk within Chimney Springs and Decoy Road in order to;</p> <ul style="list-style-type: none"> • establish an overview of the drainage and watercourse systems in the affected area • allow for quicker identification of the responsible authority in incidences of flooding. <p>Where structure or features are associated with significant flood risk these will be included on Norfolk County Council's public register. This will provide transparency for residents as to ownership and condition.</p> <p>[R7] Where it is determined that there is insufficient capacity in the public sewer system due to the inappropriate connection of surface water drainage, Anglian Water and the Lead Local Flood Authority could work together with other RMAs, organisations</p>

²⁷ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

			<p>those in need.</p>	<p>and residents to mitigate this pressure. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private property and externally.</p> <p>[R8] Based on investigations into the capacity of the drainage system, NCC highways could consider the feasibility for a capital drainage scheme in the medium to long term to improve and/or link 'the road' surface water drainage system in North Road into an alternative positive drainage system.</p> <p>[R9] Anglian Water and NCC Highways could review the existing level of maintenance required to sustain the design efficiency of their drainage systems that serves the flooding locations. These works could then be prioritised as part of Anglian Water and NCC Highways maintenance programmes. This work could also be coordinated between organisations where there is an interaction between their</p>
--	--	--	-----------------------	--

				<p>responsibilities for the drainage systems.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p> <p>[R25] NCC Highways could assess and amend the road structure to route flood water away from the affected properties to alternative points of discharge.</p>
The Oaks, Wapping	<p>[C1] Run-off from significant rainfall was concentrated at a low point within the catchment in the vicinity of which the affected properties are positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the private surface water drainage in The Oaks, Wapping. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p> <p>The above causes were exacerbated by</p> <p>[B] The structure of the affected properties was not able to withstand the impacts of flood water. As such flood water entered the property through low thresholds at entrances.</p>	Property owners for cause [C7] and [B]	<p>NCC Highways checked the gullies in the public highway adjacent to The Oaks, Wapping for silt and found that they were clear.</p> <p>Property owners of The Oaks, Wapping repaired and re-let the properties.</p>	<p>[R5] The property owner should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p>

<p>Nova Scotia Road</p>	<p>[C1] Run-off from significant rainfall was concentrated at a low point within the catchment in the vicinity of which the affected properties are positioned.</p> <p>[C4] Water flows off the highway and along a private driveway in Nova Scotia Road by the contour of the road/driveway which concentrates flood water in the vicinity of the affected properties</p> <p>[C7] Run-off from significant rainfall was directed into the surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p> <p>[C8] The highway surface water drainage system in Nova Scotia Road was partially obstructed by debris.</p> <p>The above causes were exacerbated by</p> <p>[B] The structure of the affected properties was not able to withstand the impacts of flood water. As such flood water entered the property through low thresholds at entrances.</p> <p>[E] Individual property drainage cannot cope with heavy rainfall.</p>	<p>Responsibilities NCC Highways and property owners for causes [C4] and NCC Highways for [C7] & [C8]</p> <p>Property owners for [B] and [E]</p>	<p>Property</p>	<p>[R5] The property owner should determine the adequacy of the on-site drainage and where appropriate increase on-site storage capacity and system efficiency.</p> <p>[R8] Based on investigations into the capacity of the drainage system, NCC highways could consider the feasibility for a capital drainage scheme in the medium to long term to improve and/or link 'the road' surface water drainage system in wapping' into an alternative positive drainage system.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate.</p> <p>[R25] NCC Highways could assess and amend the road structure to route flood water away from the affected properties to alternative points of discharge and/ or reduce debris entering the drainage system.</p>
-------------------------	--	---	-----------------	--



Ormesby St. Margaret Catchment

Map 4

(D) Winterton Catchment

1. General Description The Winterton-on-Sea catchment flows North from the higher, predominately rural, ground to the South. The main flow path follows The Craft and Winmer Avenue discharging into a series of land drains that ultimately connect via other watercourses into the River Thurne.

2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
19 properties	50 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment is listed below; (please see Map 5 for approximate locations of incidents within the catchment).

(a) **The Craft** - 1 property was internally flooded on The Craft²⁸. This property was flooded on the 27 June 2014. This incident was reported by Great Yarmouth Borough Council.

4. Desk Study The flooding incident within this catchment is;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management area.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Associated with significant overland flow path(s).
- Outside Flood Zones 2 & 3.
- Situated within an area of geology likely to have good rates of infiltration.
- Not near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to only be served by public foul water sewers.
- Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Not located near to old drainage features highlighted by historic mapping and there are no further comments to add.
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- A location that has experienced external flooding before
- Near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and is included in Stage 1 of the Great Yarmouth SWMP.

5. Responsibilities From the desk study it is indicated that the management of local drainage of Anglian Water, NCC Highways and riparian/property and land owners.

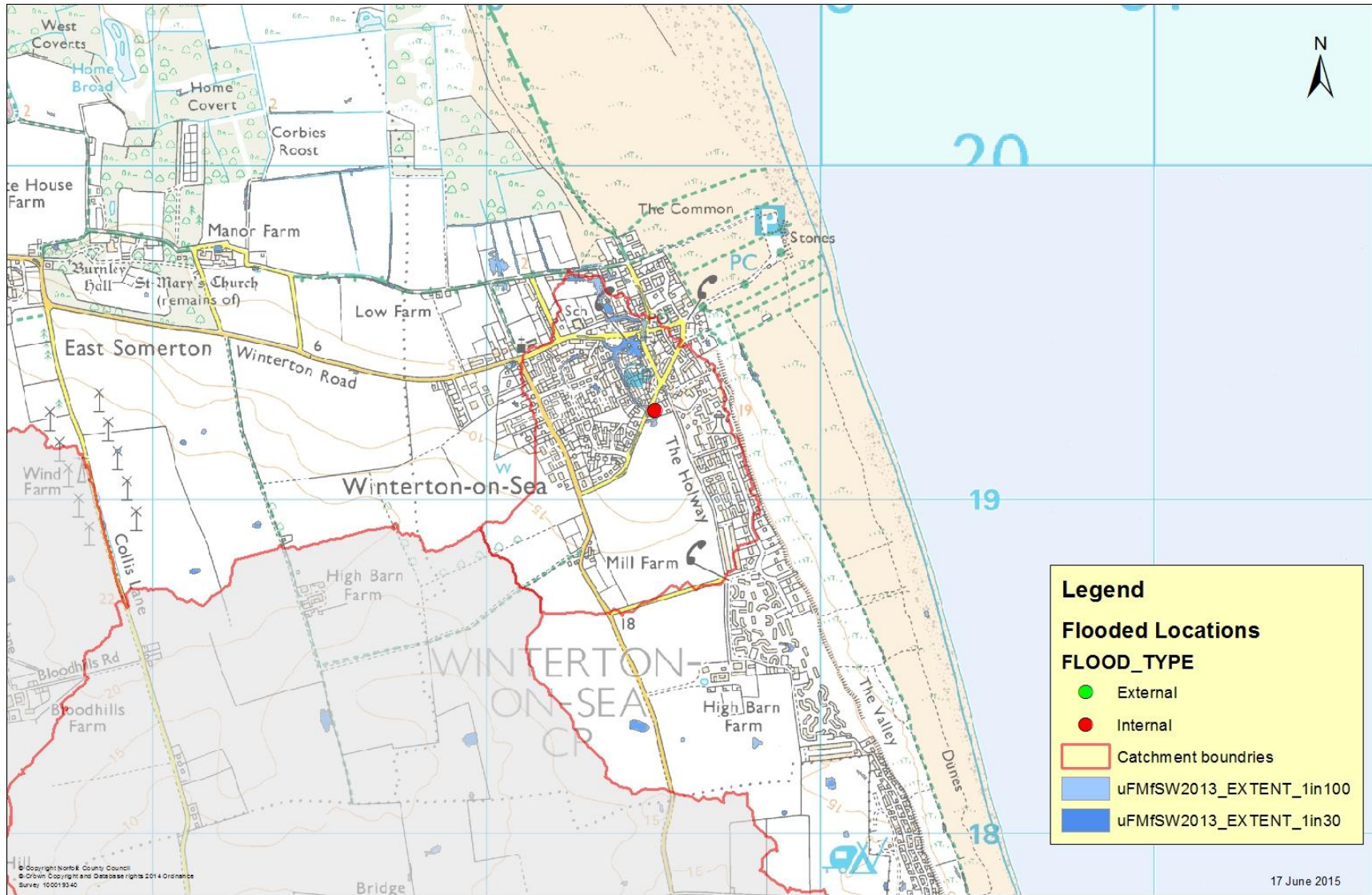
²⁸ Email correspondence with Great Yarmouth Borough Council 4 July 2014 (1314)

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ²⁹
<p>Winterton Catchment</p> <p>The Craft</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected properties are positioned.</p> <p>[C4] Water is directed off the highway by dropped kerbs on to the property access which concentrates flood water towards the vicinity of the affected properties</p> <p>[C14] Water is directed from the adjacent field which concentrates flood water towards the affected property.</p>	<p>Property owner and NCC Highways for cause [C4]</p> <p>Adjacent landowner for cause [C14]</p>	<p>The adjacent landowner has created a large attenuation area adjacent to the affected property</p> <p>NCC Highways have identified that there are no gullies serving the highway and are investigating the potential for a future scheme.</p>	<p>[R8] Based on investigations into the capacity of the drainage system, NCC highways could consider the feasibility for a capital drainage scheme in the medium to long term to improve and/or link 'the road' surface water drainage into an alternative positive drainage system.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where appropriate</p> <p>[R13] RMAs and riparian owners to determine the appropriate maintenance regime in line with the risk identified. This could include the coordination of any future capital or maintenance programmes.</p> <p>[R28] The adjacent landowner to The Craft could implement</p>

²⁹ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

				appropriate land management techniques to reduce the surface water run-off.
--	--	--	--	---



Winterton-on-sea Catchment

Map 5

Norfolk County Council

1:10,000

(E) Blocka Run Catchment

1. General Description This catchment flows East to West through St. Olaves into the River Waveney.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
63 properties	136 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 6 for approximate locations of incidents within the catchment).

- (a) **Beccles Road, St Olaves** - 1 property was internally flooded on Beccles Road, St Olaves³⁰. This property was flooded on the 10 July 2014. This incident was reported by Great Yarmouth Borough Council and the Fire and Rescue Service.

4. Desk Study The flooding incident within this catchment is;
 - Located within the Great Yarmouth Borough Council administrative boundary.
 - Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
 - Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
 - Adjacent to significant pooling or ponding.
 - Within Flood Zones 2 & 3
 - Situated within an area of geology likely to have good rates of infiltration.
 - Near to NCC inspected structures recorded on the NCC Bridges layer.
 - Shown by Anglian Water records to only be served by public foul water sewers.
 - Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
 - Located near to old drainage features highlighted by historic mapping and there are wells 35m to the North and old ditches 45m to the South.
 - Not within 2.5km of a rain gauge
 - Not associated with flooding from ordinary watercourses or main rivers.
 - A location that has experienced flooding before
 - Not mentioned in any previously published flood studies or reports and there are no further comments to add.
5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of the Waveney, Lower Yare & Lothingland Internal Drainage Board, Norfolk County Council Highways, Anglian Water and property, riparian and land owners.

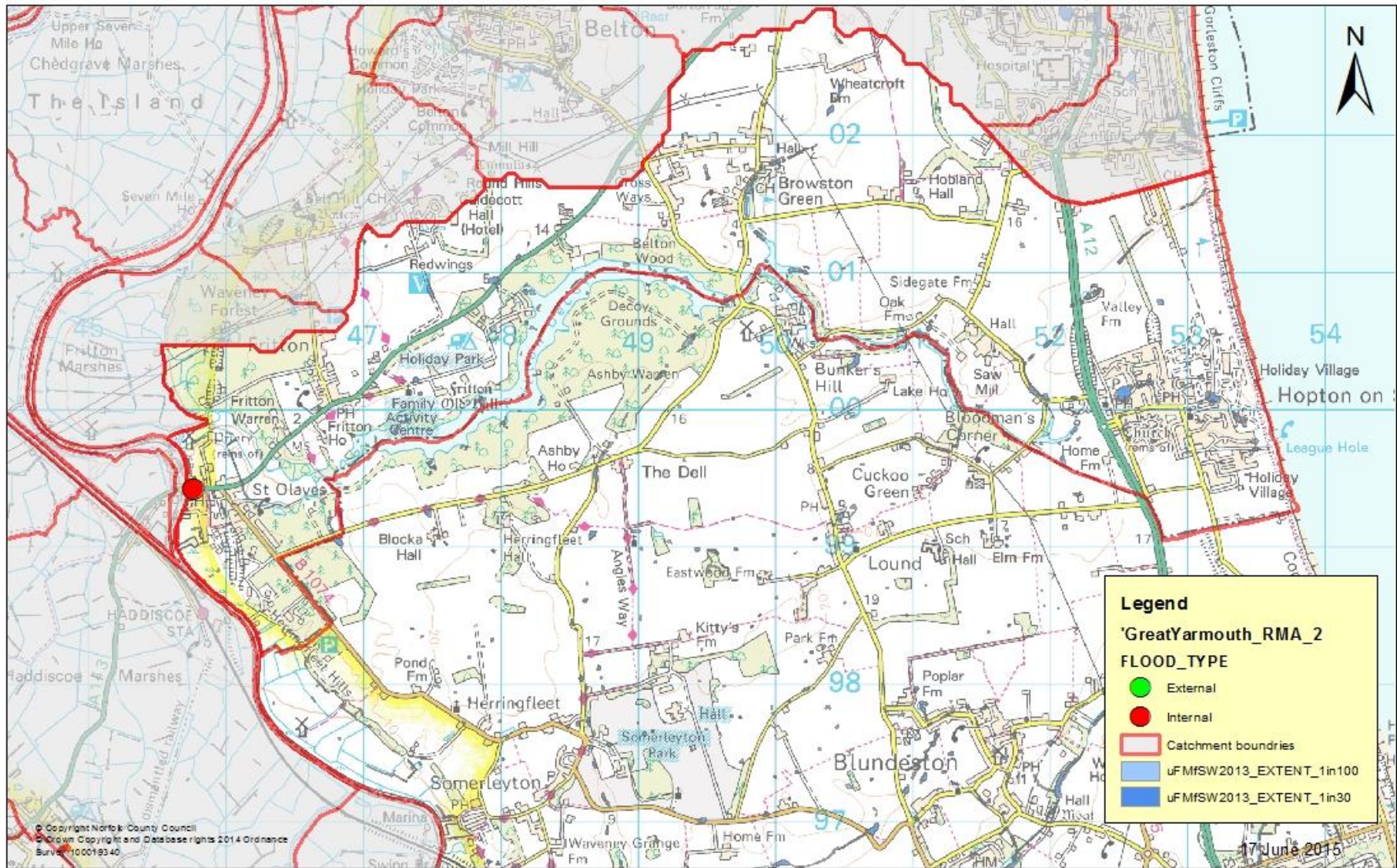
³⁰ Fire and Rescue Service Report 12 July 2014 and Email correspondence with Great Yarmouth Borough Council 11 July 2014 (1229)

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ³¹
<p>Blocka Run</p> <p>Beccles Road, St Olaves</p>	<p>[C1] Run-off from Significant rainfall was concentrated at a low point within the vicinity of which the affected property is positioned.</p> <p>[C4] Water was found to flow from the highway to the property access and concentrated flood water in the vicinity of the affected properties.</p> <p>[C7] Run-off from significant rainfall was directed into the surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected properties.</p> <p>The above causes were exacerbated by:</p> <p>[B] The structure of the affected property was not able to withstand the impacts of flood water. As such flood water entered the property through low thresholds.</p> <p>[F] The river levels within the River Waveney were high</p>	<p>NCC Highways for cause [C4] and [C7].</p> <p>Property owner for [B].</p>	<p>Property owner took measures to protect their property e.g. sandbags</p> <p>Fire service pumped out water from the property.</p> <p>Norfolk County Council carried out maintenance to a tidal flap in July 2014 in response to the event.</p>	<p>[R1] Norfolk County Council could work with Risk Management Authorities to identify structures or features that have an effect on local flood risk within the Blocka Run Catchment in order to;</p> <ul style="list-style-type: none"> • establish an overview of the drainage and watercourse systems in the affected area • allow for quicker identification of the responsible authority in incidences of flooding. <p>Where structure or features are associated with significant flood risk these will be included on Norfolk County Council's public register. This will provide transparency for residents as to ownership and condition.</p> <p>[R12] The property owners should aim to protect their buildings through flood protection measures where</p>

³¹ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

	<p>[H] The surface water drainage network was partially obstructed by structural failure. This reduced the efficiency of the drainage system contributing to the accumulation of surface water flood water at the affected property.</p>			<p>appropriate.</p> <p>[R13] RMAs and riparian owners to determine the appropriate maintenance regime in line with the risk identified. This could include the coordination of any future capital or maintenance programmes.</p> <p>[R25] NCC Highways could assess and amend the road structure to route flood water away from the affected properties to alternative points of discharge.</p>
--	---	--	--	---



Blocka Run Catchment

Map 6

Norfolk County Council

1:35,000

(F) Bradwell Catchment

1. General Description This catchment flows West from the higher predominately urban, ground to the East. The main flow path follows Primrose Way, Sun Lane and Lord's Lane discharging into Stepshort Dyke which in turn connects to the River Waveney. The urban section of the catchment forms the Bradwell Critical Drainage Catchment identified in the Great Yarmouth Borough Surface Water Management Plan.

2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
221 properties	493 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 7 for approximate locations of incidents within the catchment).

- (a) **Margeurite Close** - 1 property was internally flooded on Margeurite Close³². This property was flooded on the 13 July 2014. This incident was reported by Anglian Water.

4. Desk Study The flooding incident within this catchment is;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Associated with significant overland flow path(s).
- Outside Flood Zones 2 & 3.
- Near to properties included on the Anglian Water Flooding register.
- Situated within an area of geology likely to have good rates of infiltration.
- Not near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to only be served by public foul water sewers.
- Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Located near to old drainage features highlighted by historic mapping and there is an old pond 33m to the North-East.
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- A location that has not experienced flooding before
- Mentioned in previously published flood studies or reports and

³² Anglian Water Report (1315)

has been covered by the Great Yarmouth Borough SWMP.

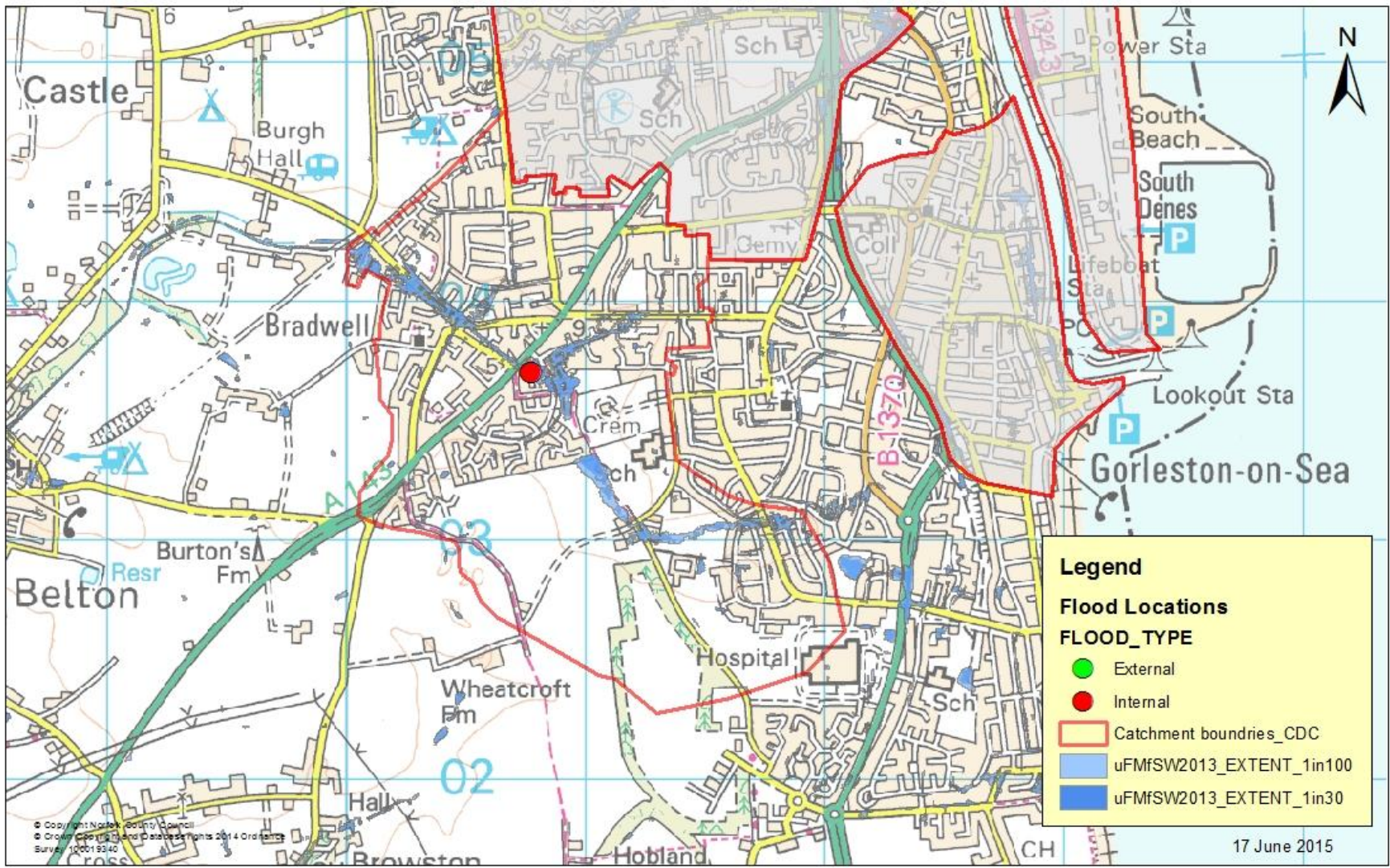
5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of Norfolk County Council Highways, Anglian Water and property owners.

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ³³
<p>Bradwell Catchment</p> <p>Margeurite Close</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the foul sewer network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p>	<p>Anglian Water for cause [C7].</p>	<p>Anglian Water have placed the affected property on the flooding register and will investigate how they can implement mitigation measures to reduce the risk to this affected property.</p>	<p>(R7) Where it is determined that there is insufficient capacity in the public sewer system due to the inappropriate connection of surface water drainage, Anglian Water and the Lead Local Flood Authority could work together with other RMAs, organisations and residents to mitigate this pressure. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private property and externally.</p>

³³ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

				[R28] Anglian Water to assess the cost benefit of completing a capital flood alleviation scheme and prioritise works in line with their business planning and AMP processes.
--	--	--	--	---



Bradwell Catchment

Map 7

Norfolk County Council

1:20,000

(G) Claydon, Southtown and Cobham Catchment

1. General Description This catchment flows North-West from the higher predominately urban ground to the South and South-East. Surface water flow paths discharge into a series of land drains which in turn connect with the River Waveney and Breydon Water. The urban section of the catchment forms the Claydon, Southtown and Cobham Critical Drainage Catchment identified in the Great Yarmouth Borough Surface Water Management Plan.

2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
168 properties	557 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 8 for approximate locations of incidents within the catchment).

(a) **Beccles Road** -2 properties were internally flooded on Beccles Road³⁴. These properties were flooded on the 13 July 2014. This incident was reported by Anglian Water.

4. Desk Study The flooding incidents within this catchment are;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Associated with significant overland flow path(s).
- Within Flood Zones 2 & 3
- Situated within an area of geology likely to have good rates of infiltration.
- Near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to only be served by public combined (foul and surface water) sewers.
- Adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Located near to old drainage features highlighted by historic mapping and there is an old ditch now filled in 100m to the West.
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- Locations that have not experienced flooding before
- Near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and

³⁴ Anglian Water Report (1300 & 1301)

was covered by the Great Yarmouth SWMP.

5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of the Waveney, Lower Yare & Lothingland Internal Drainage Board, Anglian Water, NCC Highways, Environment Agency and property, riparian and land owners.

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ³⁵
<p>Claydon, Southtown and Cobham</p> <p>Beccles Road</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the foul sewer network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p>	<p>Anglian Water for cause [C7].</p>	<p>Anglian Water have placed the affected property on the flooding register and will investigate how they can implement mitigation measures to reduce the risk to this affected property.</p>	<p>(R7) Where it is determined that there is insufficient capacity in the public sewer system due to the inappropriate connection of surface water drainage, Anglian Water and the Lead Local Flood Authority could work together with other RMAs, organisations and residents to mitigate this pressure. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private property and externally.</p> <p>[R28] Anglian Water to assess the cost benefit of completing a capital flood alleviation scheme and prioritise works in line with their business planning and AMP processes.</p>

³⁵ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.



Claydon, Southtown and Cobham Catchment

Map 8

(H) Pickerill Holme Catchment

1. General Description This Caister-on-Sea catchment flows south-west from the higher predominately urban, ground to the north and north-east. Three main flowpaths discharge into a series of land drains which connect to the River Bure.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
269 properties	809 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 9 for approximate locations of incidents within the catchment).
 - (a) **Nelson Road** - 1 property was internally flooded on Nelson Road³⁶. This property was flooded on the 27 June 2014. This incident was reported by Anglian Water.
 - (c) **Honeymoon Loke** - 1 property was internally flooded on Honeymoon Loke. This property was flooded on the 27 June 2014. This incident was reported by Anglian Water³⁷.

4. Desk Study The flooding incident within this catchment is;
 - Located within the Great Yarmouth Borough Council administrative boundary.
 - Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
 - Located within the Broads (2006) IDB area for the regulation of ordinary watercourses.
 - Located within the Anglian Water area for the management of public sewers.
 - Primarily served by Norfolk County Council Highways managed road network.
 - Not identified as being affected by, or adjacent to, surface water flood mapping.
 - Within Flood Zones 2 & 3
 - Situated within an area of geology likely to have good rates of infiltration.
 - Not near to NCC inspected structures recorded on the NCC Bridges layer.
 - Shown by Anglian Water records to only be served by public foul water sewers.
 - Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
 - Not located near to old drainage features highlighted by historic mapping and no further comments to add.

³⁶ Anglian Water Report 14 May 2015 (1299)

³⁷ Anglian Water Report 20 May 2015 (1319)

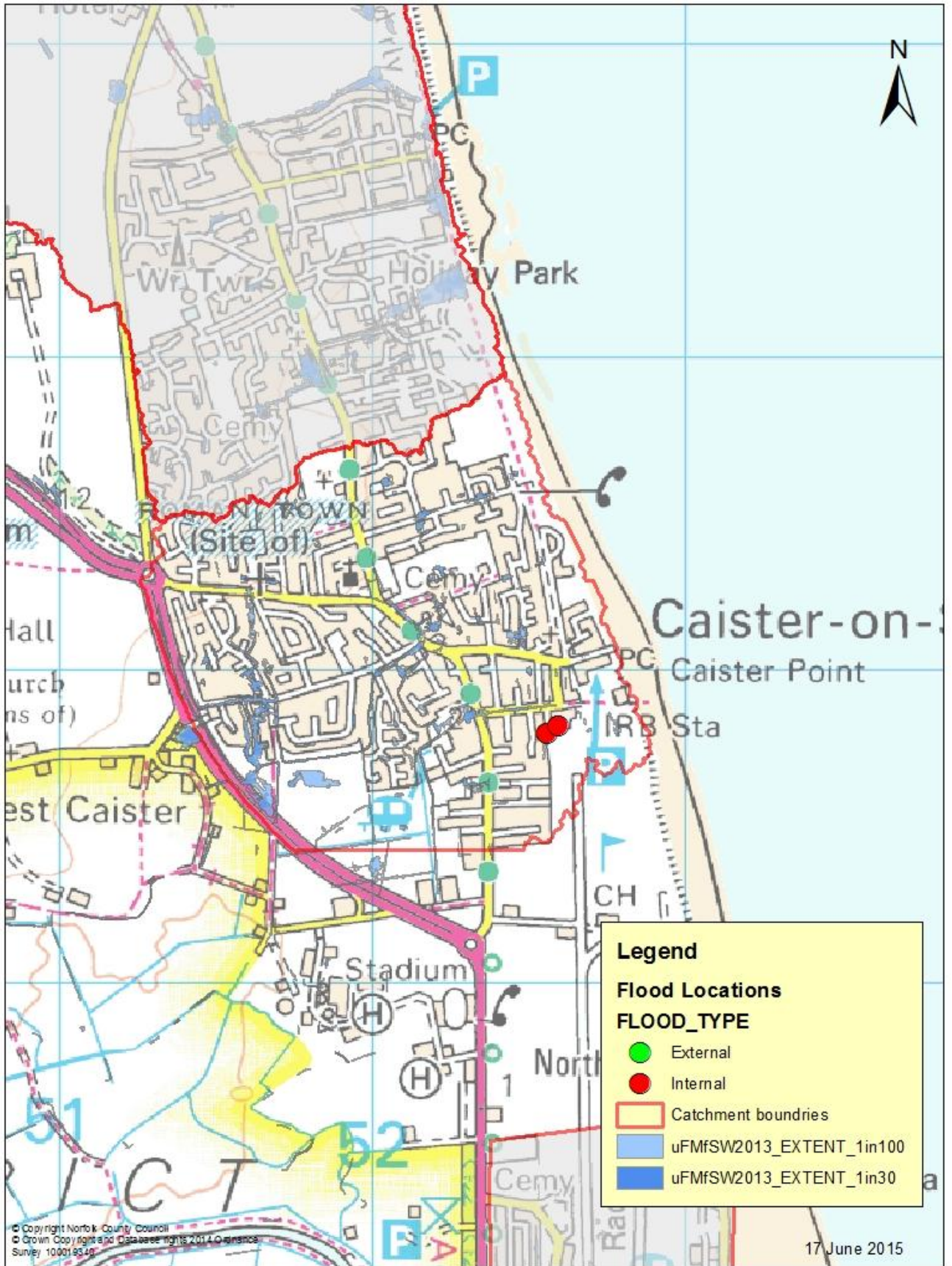
- Within 2.5km of an Environment Agency rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- Locations that have not experienced internal or external flooding before
- Near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and detailed drainage assessment as part of the Great Yarmouth Borough SWMP.

5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of NCC Highways, Anglian Water and property, riparian and landowners.

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ³⁸
<p>Pickerill Holme Catchment</p> <p>Nelson Road</p> <p>Honeymoon Loke</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the foul sewer network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p>	<p>Anglian Water for cause [C7].</p>	<p>Anglian Water have placed the affected property on the flooding register and will investigate how they can implement mitigation measures to reduce the risk to this affected property.</p>	<p>(R7) Where it is determined that there is insufficient capacity in the public sewer system due to the inappropriate connection of surface water drainage, Anglian Water and the Lead Local Flood Authority could work together with other RMAs, organisations and residents to mitigate this pressure. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private property and externally.</p> <p>[R28] Anglian Water to assess the cost benefit of completing a capital flood alleviation scheme and prioritise works in line with their business planning and AMP processes.</p>

³⁸ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.



Pickerill Holme Catchment

Map 9

Norfolk County Council

1:15,000

(I) Northgate Catchment

1. General Description This small low lying urban catchment flows north-west crossing Northgate Street towards the River Bure. The catchment forms the Northgate Critical Drainage Catchment identified in the Great Yarmouth Borough Surface Water Management Plan.
2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
114 properties	422 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 10 for approximate locations of incidents within the catchment).

- (a) **Market Gates** - 1 property was internally flooded on Market Gates³⁹. This property was flooded on the 10 July 2014. This incident was reported by Anglian Water.

4. Desk Study The flooding incident within this catchment is;
- Located within the Great Yarmouth Borough Council administrative boundary.
 - Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
 - Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
 - Located within the Anglian Water area for the management of public sewers.
 - Primarily served by Norfolk County Council Highways managed road network.
 - Not identified as being affected by, or adjacent to, surface water flood mapping.
 - Outside Flood Zones 2 & 3.
 - Situated within an area of geology likely to have good rates of infiltration.
 - Not near to NCC inspected structures recorded on the NCC Bridges layer.
 - Shown by Anglian Water records to be served by public foul and combined (foul and surface water) sewers.
 - Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
 - Not located near to old drainage features highlighted by historic mapping
 - Not within 2.5km of a rain gauge
 - Not associated with flooding from ordinary watercourses or main rivers.
 - Locations that have not experienced internal or external flooding before
 - Near to properties included on the Anglian Water Flooding

³⁹ Anglian Water Report 20 May 2015 (1318)

register.

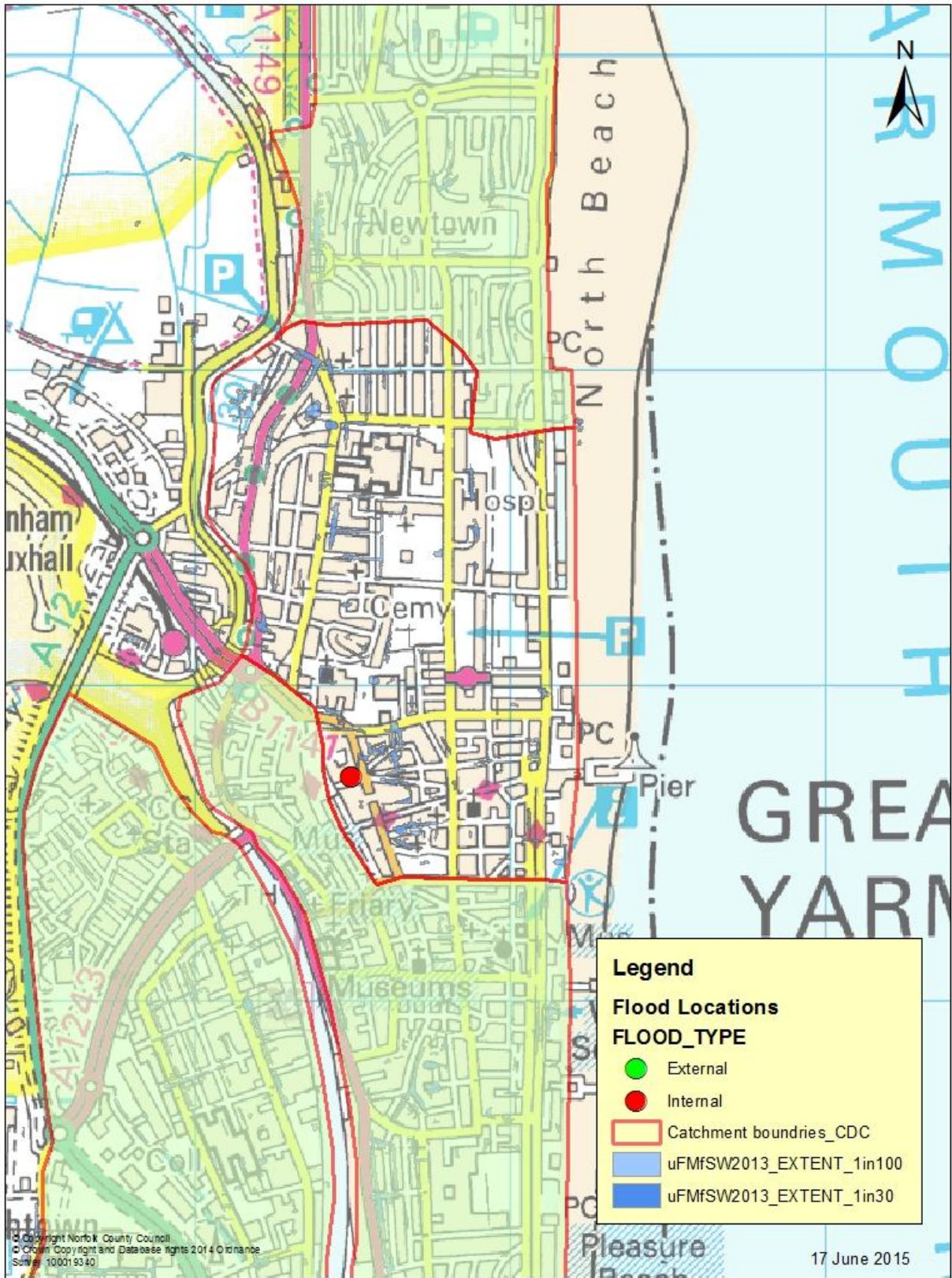
- Mentioned in previously published flood studies or reports and Covered in the Great Yarmouth Strategic Flood Risk Assessment of 2009 and also covered by the flood risk modelling in the Great Yarmouth Surface Water Management Plan. The area was taken forward as a Critical Drainage Catchment for detailed assessment and specific actions exist in the plan to mitigate surface water flood risk.

5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of Anglian Water, NCC Highways and property, riparian and landowners.

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ⁴⁰
<p>Northgate Catchment</p> <p>Market Gates</p>	<p>[C2] Run-off from significant rainfall was concentrated along overland flow paths on which the affected property is positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the foul sewer network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property.</p>	<p>Anglian Water for cause [C7].</p>	<p>Anglian Water have placed the affected property on the flooding register and will investigate how they can implement mitigation measures to reduce the risk to this affected property.</p>	<p>(R7) Where it is determined that there is insufficient capacity in the public sewer system due to the inappropriate connection of surface water drainage, Anglian Water and the Lead Local Flood Authority could work together with other RMAs, organisations and residents to mitigate this pressure. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private property and externally.</p> <p>[R?] Anglian Water to assess the cost benefit of completing a capital flood alleviation scheme and prioritise works in line with their business planning and AMP processes.</p>

⁴⁰ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.



(J) South Yarmouth

1. General Description This low lying urban catchment is made up of a series of short flowpaths discharging into the River Yare or South Beach. The catchment forms the South Yarmouth Critical Drainage Catchment identified in the Great Yarmouth Borough Surface Water Management Plan.

2. Flood Risk The number of residential properties at flood risk from local sources of flooding within this catchment are set out below for 2 different rainfall events;

1 in 30	1 in 100
156 properties	417 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment are listed below; (please see Map 11 for approximate locations of incidents within the catchment).

- (a) **King Street** -1 property was internally flooded on King Street⁴¹. This property was flooded on the 12 May 2014. This incident was reported by the Fire and Rescue Service.

4. Desk Study The flooding incident within this catchment is;

- Located within the Great Yarmouth Borough Council administrative boundary.
- Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
- Located within the Lead Local Flood Authority area for the regulation of ordinary watercourses.
- Located within the Anglian Water area for the management of public sewers.
- Primarily served by Norfolk County Council Highways managed road network.
- Associated with significant pooling or ponding.
- Outside Flood Zones 2 & 3.
- Situated within an area of geology likely to have good rates of infiltration.
- Not near to NCC inspected structures recorded on the NCC Bridges layer.
- Shown by Anglian Water records to be served by public foul and combined (foul and surface water) sewers.
- Is adjacent to highway that is publically maintainable and highway drainage features are visible on Street View.
- Not located near to old drainage features highlighted by historic mapping
- Not within 2.5km of a rain gauge
- Not associated with flooding from ordinary watercourses or main rivers.
- Locations that have not experienced internal or external

⁴¹ Fire and Rescue Service Report 19 July 2015 (1204)

flooding before

- Not near to properties included on the Anglian Water Flooding register.
- Mentioned in previously published flood studies or reports and Covered in the Great Yarmouth Strategic Flood Risk Assessment of 2009 and also covered by the flood risk modelling in the Great Yarmouth Surface Water Management Plan. The area was taken forward as a Critical Drainage Catchment for detailed assessment and specific actions exist in the plan to mitigate surface water flood risk.

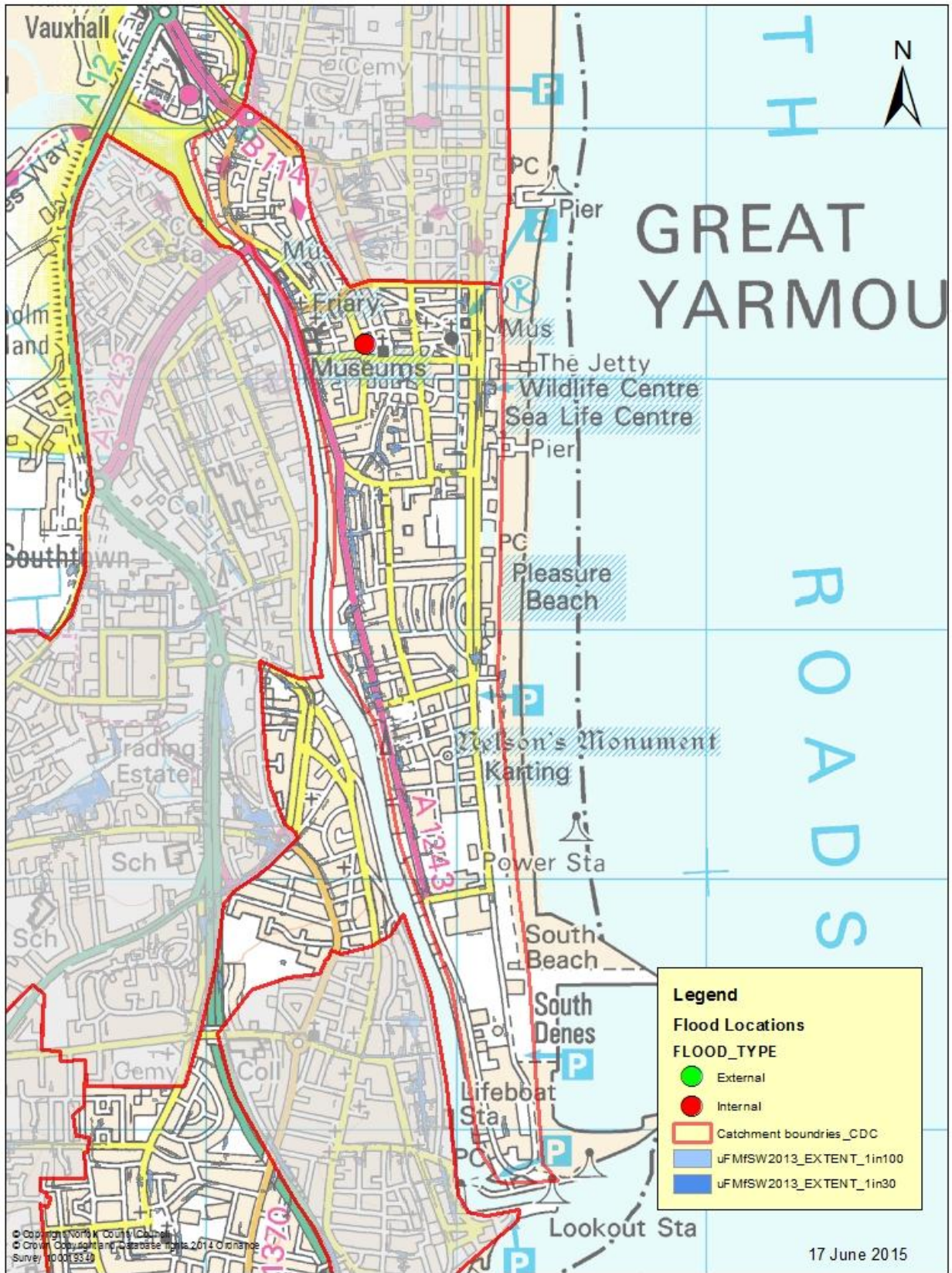
5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of Norfolk County Council Highways, Anglian Water and property, riparian and landowners.

6. Investigation Findings

Location	What caused the flooding?	Who has responsibilities to manage the cause(s) of the flood?	What was their response in relation to the cause of the flood?	Recommendations ⁴²
<p>South Yarmouth King Street</p>	<p>[C1] Run-off from significant rainfall was concentrated at a low point within the catchment in the vicinity of which the affected properties are positioned.</p> <p>[C7] Run-off from significant rainfall was directed into the surface water drainage network. This exceeded the design capacity of the system. This contributed to the accumulation of flood water at the affected property</p> <p>The above causes were exacerbated by the factors below:</p> <p>[B] The structures of the affected properties within the catchment were not able to withstand the impacts of flood water. As such flood water entered the property through a variety of mechanisms e.g. low thresholds on entrances and unsealed cellar doors.</p> <p>[H] Due to development of impermeable</p>	<p>NCC Highways for cause [C7]</p> <p>Property owner for cause [B]</p>	<p>Fire and Rescue Service pumped out the property.</p> <p>Highways carried maintenance on the gullies adjacent to the property in response to the event.</p>	<p>[R9] NCC Highways could review the existing level of maintenance required to sustain the design efficiency of their drainage systems that serves the flooding locations. These works could then be prioritised as part of NCC Highways maintenance programmes. This work could also be coordinated between organisations where there is an interaction between their responsibilities for the drainage systems.</p> <p>[R12] The property owner should aim to protect their buildings through flood protection measures where appropriate.</p>

⁴² The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

	surfaces localised ground conditions caused water run-off to be directed quickly from where it fell as rain to the areas of flooding.			
--	---	--	--	--



South Yarmouth Catchment

Map 11

Appendix A - Key definitions and responsibilities

What Is Flooding?

- A.1 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?

- A.2 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;
- Basements and below ground level floors are included.
 - Garages are included if in the fabric of the building. Garages adjacent or separate from the main building are not included.
 - Occupied caravans are included but not tents.
- A.3 **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?

- A.4 Local Flood Risk is defined by the Flood and Water Management Act 2010 as being flood risk from surface runoff, groundwater and ordinary watercourses.
- ‘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.
 - ‘Groundwater’ means all water which is below the surface of the ground and in direct contact with the ground or subsoil.
 - ‘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.

Roles and Responsibilities of Risk Management Authorities

- A.5 Below is a short summary of those groups and Risk Management Authorities (RMAs) that have a role in managing the flooding within the Norwich urban area. The listing of responsibilities includes those duties or powers that

directly relate to managing the flood incidents or consequence. All RMA's have a duty to cooperate with other RMAs.

Norfolk County Council (duties under the Flood and Water Management Act 2010 and the Civil Contingencies Act 2004)

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

District Councils (Great Yarmouth Borough Council):

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

Internal Drainage Boards-“IDBs” (The Broads (2006). The Waveney, Lower Yare and Lothingland IDB).

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

Highway Authorities (Norfolk County Council Highways acting agent for the County Council):

- Powers to undertake works to manage water on the highway and to move water off the highway
- Enforcement powers to unauthorised alterations, obstructions and interferences with highway drainage
- 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 Maintenance activity⁴³ - delivered on a as needs basis by the relevant Highways area team.

⁴³ It should be noted that Highways Area teams are primarily interested in the ability of highway users to pass and repass not necessarily NCC's riparian responsibilities.

Water Companies (Anglian Water Services Ltd):

- Undertake capital schemes to alleviate or eliminate flooding where the flood event is associated with a failure of their assets
- Duty to provide, improve, maintain and operate systems of public sewers and works for the purpose of effectually draining an area
- Are responsible for flooding from their foul, combined and surface water sewers, and from burst water mains
- 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.
- 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
- Duties as a Category 2 Responder for Emergency Planning

Riparian Owners:

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