



Norfolk County Council

Investigation Report into flooding at Station Road, Ditchingham, on 29th June 2014.

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	Name	Date
Prepared by:	Maurice Beseng	21/05/2015
Checked by:	Mark Henderson	20/11/2015
Approved by:	Graham Brown	06/01/2016

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1. Executive Summary

On 29 June 2014, 2 properties flooded internally on Station Road, Ditchingham within South Norfolk District. This internal flooding was as a result of;

- Run-off from significant rainfall being concentrated at a low point
- Overloading of the foul sewer system
- Partial obstructions within the highways surface water drainage systems

The organisations primarily tasked with managing the causes of the flooding detailed in this report are Anglian Water Services, Norfolk County Council (as Highway Authority and Lead Local Flood Authority), the Waveney, Lower Yare and Lothingland Internal Drainage Board (“IDB”) and the Broads Authority.

In response to the flood incidents;

- Anglian Water Services attended to pump out a property and to fit a non-return valve within the property sewer system. They later surveyed the sewer system and dye test Highway gullies to check if any surface water was discharging into the sewer network from the highway gullies.
- The Waveney, Lower Yare and Lothingland IDB have surveyed the Alma Beck to assess its capacity to receive surface water from the Highways drainage outfall.
- Norfolk County Council Highways has accessed the surface water outfall into the Alma Beck to clear any obstruction affecting the drainage capacity of the system.
- South Norfolk District Council provided sandbags and advice to the affected residents to enable them to protect their properties from future rainfall events.
- The Parish Council and the Cllr for Ditchingham & Broome Ward organised meetings with concerned organisations and residents.

In assessing incidents of flooding it is important to qualify the nature of the rainfall event that led to the internal flooding of properties. As such rainfall data is sought to enable this assessment to be undertaken. To ensure that any analysis reflects the localised nature of these events a 2.5 km radius from rain gauges is used in screening the availability of data. Unfortunately, the flooding incidents at this location do not lie within the 2.5km radius of the nearest rain gauge. As such the exact nature of the rainfall event that led to the flooding of these properties cannot be assessed.

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.

A number of recommendations have been included in this report. The key themes identified are;

- Property owners to consider protecting their property
- Anglian Water Services Ltd to access the foul water system integrity and consider a capital bid to improve its design capacity
- NCC Highways and The Waveney, Lower Yare and Lothingland IDB to prioritize cleaning the surface water outfall at the Alma Beck.

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.

2. Justification for Flood Investigation

2.1 It was deemed necessary to complete a formal investigation into the flood incidents that occurred at Station Road, Ditchingham in June 2014 as:

a) Multiple residential properties were internally flooded

2.2 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

2.3 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.

2.4 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 South Norfolk area, which can be used in current funding bids for flood mitigation schemes

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

3. Overview of the Flooding Incident

1. General Description The flooding incidents covered by this report are located within Ditchingham Parish and the River Waveney catchment. The flooding incidents primarily relate to localised surface water flow paths that flow generally North to South within Ditchingham settlement.
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
175 properties	406 properties

3. Incidents as reported The breakdown of flooding incidents within the catchment is listed below; (please see Map 1 for approximate locations of incidents within the catchment).

- (a) **Station Road** - 2 properties were internally flooded on Station Road while two other properties suffered external flooding². These properties were flooded on the 29 June 2014 and 8 October 2014. These incidents were reported by the Councillor for Ditchingham and Broome Ward to the Lead Local Flood Authority³.

4. Desk Study The flooding incidents within this catchment are:
- Located within the South Norfolk District Council administrative boundary.
 - Located within the EA Essex, Norfolk and Suffolk admin and water management areas.
 - Located within the Waveney, Lower Yare and Lothingland IDB area for the regulation of ordinary watercourses.
 - Adjacent to significant pooling or ponding.
 - Outside elements of the catchments that are 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.
 - 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 flooding before
 - Not near to properties included on the Anglian Water DG5 register.

² NCC Highways Public Enquiry Manager on 21st July 2014 and 16th September 2014; LLFA Officer visit on 22 October 2014 (839)

³ Email received from Ditchingham & Broome Ward Councillor 29th October, 2014, (839).

- Not mentioned in any previously published flood studies or reports and the area has not been considered by Surface Water Management Plans.

5. Responsibilities From the desk study it is indicated that the management of local drainage is primarily the responsibility of Anglian Water Services, Norfolk County Council Highways, the Waveney, Lower Yare and Lothingland Internal Drainage Board and property owners.

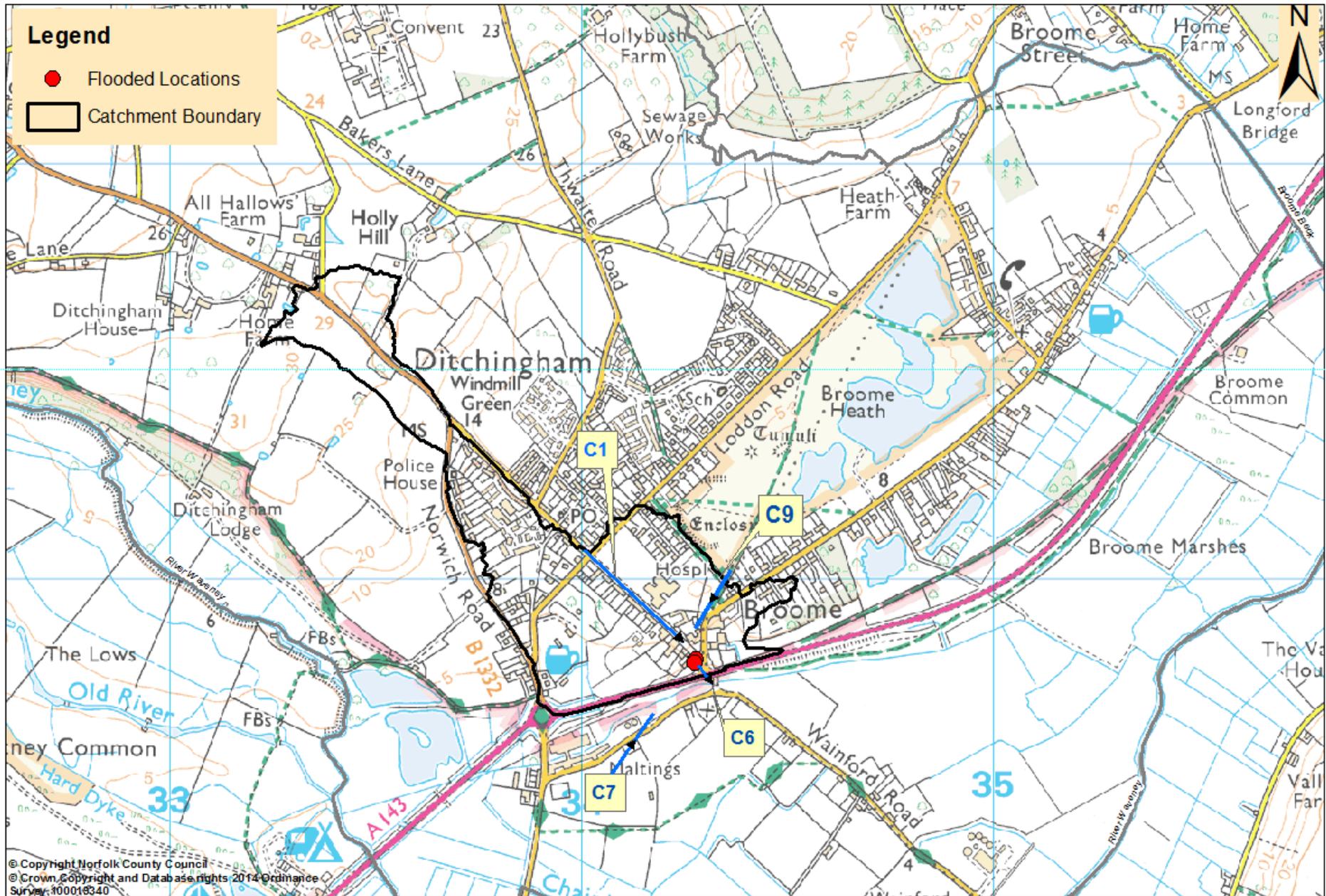
4. Summary of Investigation Findings

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 ⁴
<p>Ditchingham Station 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>[C6] The highways surface water drainage system outfall was partially obstructed by vegetation and/or high water levels downstream. This reduced the efficiency of the upstream drainage system contributing to the accumulation of surface water at the affected properties.</p> <p>[C7] Groundwater infiltration occurred into a damaged foul sewer system holding tank. This overloaded the capacity of the system exceeding the design capacity. This caused the local sewer pumping station to become overloaded causing the public sewer to backing up .</p> <p>[C9] Run-off from significant rainfall flowed into the foul system. This overloaded the capacity of the system. This caused the connections from private property into the public sewer to back up resulting in flood water at the affected properties.</p>	<p>Property owners for cause [C1]</p> <p>Norfolk County Council Highways and Waveney, Lower Yare and Lothingland IDB for [C6]</p> <p>Anglian Water Service Ltd for cause [C9] and [C7].</p>	<p>In an earlier response to flooding at this location 2 years ago, Anglian Water Services fitted non-return valves to 3 affected properties in 2012.</p> <p>On 10 October 2014, Ditchingham Parish Council convened a meeting with Anglian Water Services, local Councillors and affected residents to seek a solution to the problems.</p> <p>The County Councillor for Ditchingham and Broome Ward wrote a report and distributed it to other partners (LLFA, Broads Authority, Anglian Water Services)</p> <p>On 15 October 2014 Anglian Water Services surveyed the sewer system and dye tested Highway gullies to check if any surface water was discharging into the sewer network from Highway gullies</p> <p>On 22 October 2014 a site meeting was held with officers from NCC Highways and Flood and Water Teams, Anglian Water Services, Broads Authority, IDB and Local Councillor to assess the causes of the flooding and to seek a solution for residents.</p>	<p>(R4) Anglian Water Ltd could determine the wider (drainage) systems integrity and/or capacity to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.</p> <p>(R7) Based on investigations into the capacity of the foul drainage system Anglian Water Services could consider the feasibility for a capital drainage scheme in the medium to long term to improve the foul water drainage system.</p> <p>(R9) The Broads Authority, NCC Highways and the Waveney, Lower Yare and Lothingland IDB could identify the appropriate level of maintenance required to sustain the design efficiency of the surface water outfall into the Alma Beck. These works could then be prioritised as part of NCC Highways and IDB maintenance programmes. This work could also be coordinated between organisations where there is an interaction between their drainage systems.</p> <p>(R12) The property owners should aim to protect their buildings</p>

⁴ The recommendations highlighted in the table are referenced against the causes detailed above and should not be considered in isolation.

			South Norfolk District Council delivered sand bags to affected residents on 13 November 2014 to enable residents to protect their properties from future rainfall events.	through flood protection measures where appropriate.
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5. Map 1: General location of flooding within the catchment



Spatial distribution of flooded locations within the catchment

6. Disclaimer

- 6.1 Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, we cannot guarantee that the contents will always be current, accurate or complete.
- 6.2 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.
- 6.3 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.
- 6.4 The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.
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