Section 19 Flood Investigation

Key findings

Flood location: Drovers Way, Hatfield, AL10 0QA

Number of properties flooded: 2 Confirmed

Trigger flood event date: 23 June 2016

Previous flood events: 2015

Flooding mechanism: Surface water caused by heavy rain.

Identified risk management authorities: Lead Local Flood Authority

Investigating officer: James Lester

Date published: 03/09/2018

Summary: Bottom floor of block of flats flooded on two separate occasions.

1. Introduction

1.1. Background

How the LLFA became aware of the flooding:

- Two calls to the Fire and Rescue Service.
- Property damage reported to Hertfordshire Highways on 30 June 2016.
- LLFA followed up reports with a questionnaire survey sent to potentially impacted residents.

Reasons for investigating: Due to the flood frequency of properties flooded, Hertfordshire County Council (HCC) as Lead Local Flood Authority (LLFA) have investigated the flood incident under Section 19 of the Flood and Water Management Act (FWMA) 2010 and published this report.

1.2. Location of investigation site

Site address: Drovers Way, Hatfield, AL10 0QA
District: Welwyn-Hatfield
Regional flood and coastal committee catchment: Thames

Figure 1 Drovers Way

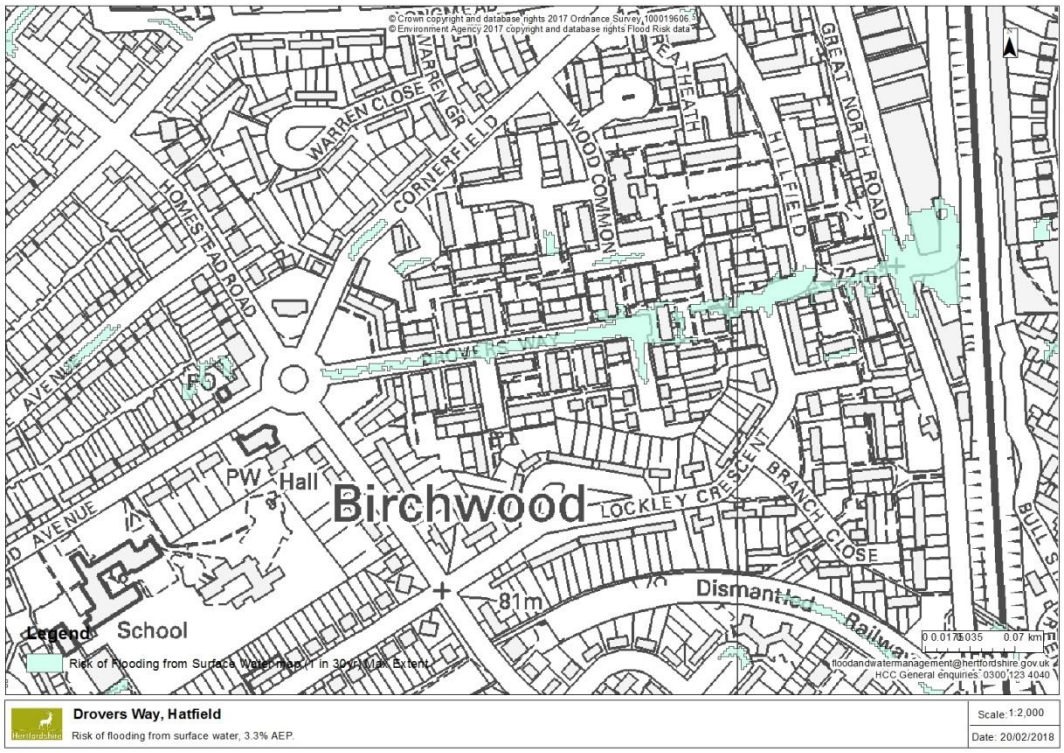
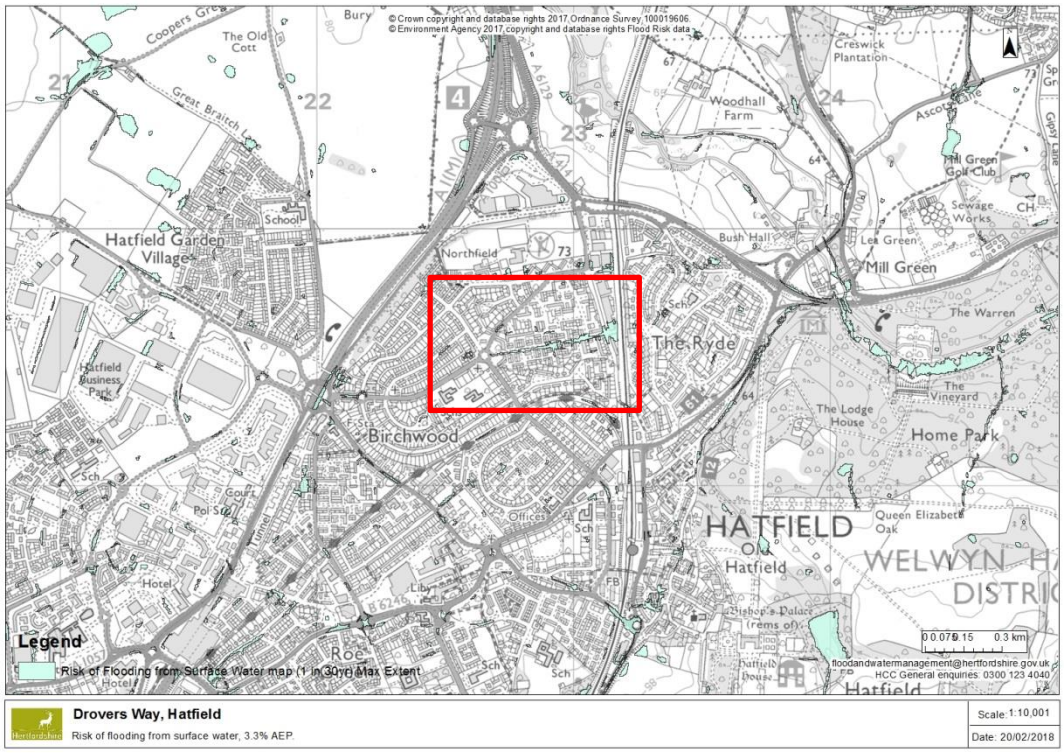


Figure 2 Hatfield



1.3. Anecdotal evidence

Reports from other organisations

- Fire and Rescue Service (FRS)

Flooding internally reported by two separate calls from two different properties at 6.30pm on 23 June 2016. The FRS attended the area but did not take any action.

- Hertfordshire County Council as the Highway Authority

Three properties flooded on Drovers Way in June 2016 including a property which was previously reported flooding during the night of 16 July 2015. The source of the flooding was not recorded in the database.

- Thames Water Utilities Limited

TWUL had no records of reports of sewer flooding on 23 June 2016 in the local area when TWUL responded to the LLFA data request in May 2017.

Questionnaire survey

A questionnaire survey was sent out to all residents in Hertfordshire who may have been impacted by the 23 June 2016 flood event. This was conducted by HCC as the LLFA. The purpose of the questionnaire was to establish the extent of the flood event, the number of properties impacted and an indication of the mechanisms that caused flooding to property or critical infrastructure.

- One flood questionnaire was returned for the area. It listed two flood events (2015 and June 2016) both of which resulted in internal flooding of approximately 60mm. Photographs were provided including Photograph 1.

Site visit

An officer from the LLFA visited Drovers Way on 20 December 2016. The officer met with two residents who confirmed that their properties had flooded. One of these residents was the one who returned the questionnaire survey. The residents said that flood water flowed from the Drovers Way roundabout along Drovers Way towards the railway line in the opposite direction.

Photograph 1 Towards the roundabout of Drovers Way on 23 June 2016 during the flooding

1.4. Description of local drainage system

Public sewers
Brain Close is served by surface water and foul water sewers managed by Thames Water Utilities Limited (TWUL). These were not surveyed as part of this investigation, however, according to TWUL's records; a 525mm diameter surface water sewer serves Drovers Way. There is evidence to suggest that there had been previous flooding issues in the area. There are two 2000mm pipes in the surface water sewer network. These will provide upstream storage. Such oversized pipes can be expected to have been added to mitigate a known flooding problem.

The surface water sewer and foul water networks in Hatfield are the responsibility of Thames Water Utilities Ltd (TWUL). In this catchment, the sewer networks for foul water and surface water are separate. TWUL's networks must operate within the rules laid out as part of the Water Industry Act 1991.

Highway drainage
There are gullies on Drovers Way to drain the road. The connectivity of these has not been confirmed but they will connect either to the public surface water sewer or soakaways. Drovers Way and the surrounding roads are on the 18 month gully clean cycle. It is not the role of highway drainage to prevent flooding to property so a more detailed understanding of the highway drainage network has not been pursued.

Any other drainage
No other issues identified.

1.5. Hazard map

Nationally recognised Flood Hazard Ratings have been developed by the Environment Agency for England as there is an acceptance that not all flood risks can be managed and there is a requirement to estimate the current risks from flooding to people, the economy and the environment.

A national flood hazard rating methodology was developed with four classes in order to better and more simply highlight risk. Property in Drovers Way has a hazard rating of between 0.75 and 1.25, which is second out of the four classifications. This is further defined as a 'Moderate' degree of flood risk (the other 3 classifications being Low, Significant and Extreme). Moderate risk can present more of a hazard for vulnerable groups, such as children and the elderly. For the flood hazard map in relation to Drovers Way, see Figure 3.

Figure 3 Hazard map

The hazard rating is only as good as the data which it is based on and small differences in the topography data can have significant implications. The context of the flood hazard map should be considered when reading it.

2. Causes

2.1. Rainfall Analysis

There was heavy recorded rainfall on 23 June 2016. The rainfall was typical of a summer thunderstorm that swept through Hertfordshire. The hyetograph (Figure 4) shows the intensity of rain every five minutes during 23 June 2016. A sharp peak of rainfall at an intensity of approximately 50 mm/hr was recorded at 18:10. It is predicted that 12mm of rain fell in half an hour between 5.55 pm and 6.25pm. Figure 5 is a rainfall radar map of the rainfall during the flood event. It shows rain in the Hatfield area was estimated to reach an intensity of between 64 and 128 mm/hr.

The closest rain gauge to Drovers Way is at Mill Green which is about 1.7 kilometres away. Thunderstorms' intensity varies greatly over short distances. Therefore, a rain gauge 1.7 kilometres away is unlikely to reflect the thunderstorm which passed over Drovers Way on the 23 June 2016 at 18:15. Instead, the rainfall data shown in Figure 4 is a prediction based on measurements of the moisture content of the air using radar.

Figure 4 Rainfall intensity, 23 June 2016

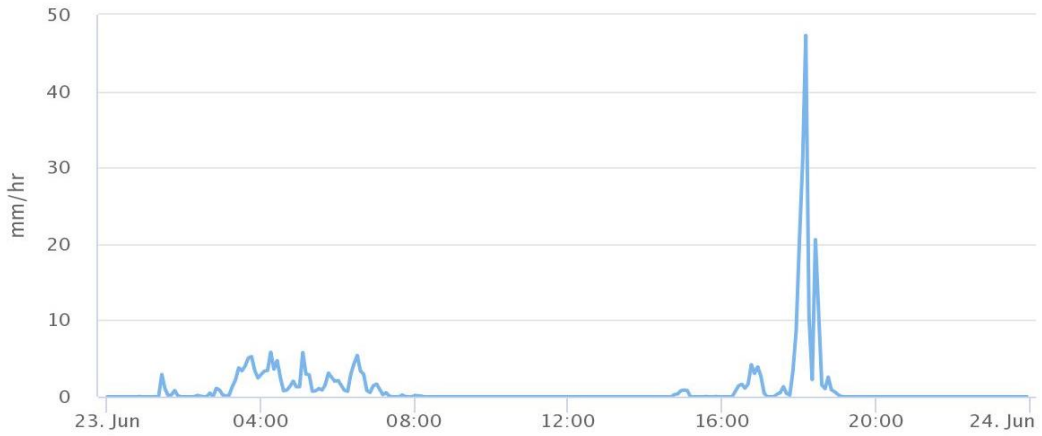
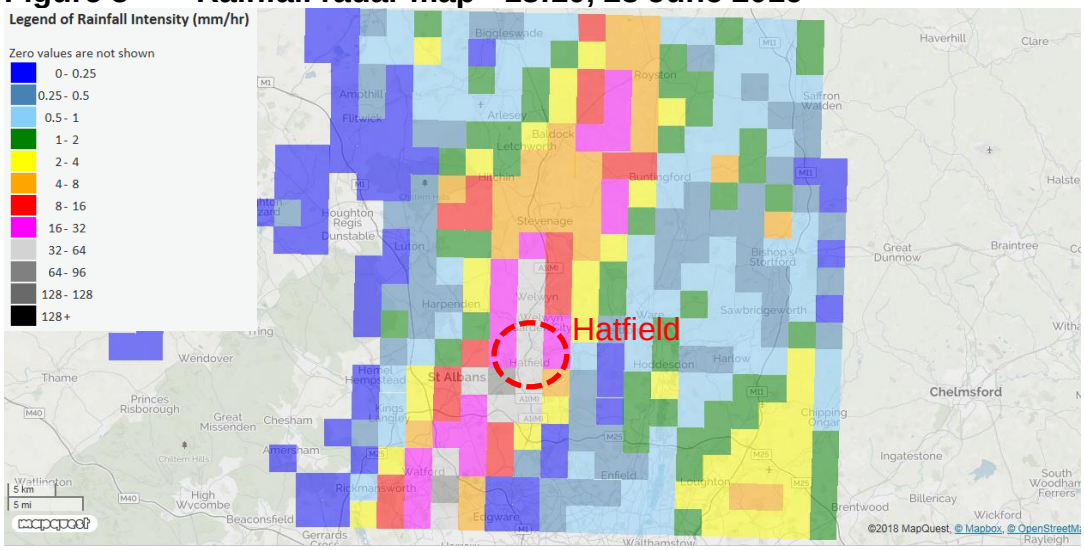


Figure 5 Rainfall radar map - 18:10, 23 June 2016



2.2. Assessment of local drainage systems

The assessment of structures and watercourses considers the condition and capacity of any culverts, watercourses, highway drainage and access structures.

Public sewers
Most surface water sewer networks are not designed to manage extreme rainfall – rainfall with a return period of 1 in 20 years or above. Hence, surcharging of public surface water sewers during extreme rainfall events does not necessarily mean that there is an operational problem with the sewer, e.g. a blockage.

There is no evidence to suggest that there were any defects within the public sewer network. Therefore, this has not been assessed as part of this investigation.

Highway drainage
Hertfordshire County Council in its capacity as the Highway Authority is responsible for draining the rainfall which falls on the highway. Highway gullies are designed to capture and drain moderate rainfall from the highway. Overland flow which enters the highway from adjacent land adds to the volumes of water that the gully network is required to drain away. Highway drainage would not be expected to cope with the rainfall event on 23 June 2016 because of its very high intensity. Even where gullies are placed to receive large volumes of water, the volume that they can discharge is limited by the outlet pipe sizes and the available capacity in the downstream network.

Any other drainage
Hertfordshire County Council as the Lead Local Flood Authority is not aware of any other drainage.

Open Watercourse Conditions
No pertinent watercourses.

3. Roles and Functions

3.1 Authorities' Roles

Part of the role of Hertfordshire County as the Lead Local Flood Authority is to identify the risk management authorities (RMAs) that have relevant flood risk management functions. Those RMAs and their relevant powers and functions are set out below.

There is no evidence to suggest that any of the identified risk management authorities failed in their responsibilities.

Hertfordshire County Council as the Lead Local Flood Authority
The receptor was flooded by surface runoff. The Lead Local Flood Authority [Hertfordshire County Council] has powers for managing the risk of flooding from surface runoff.

Hertfordshire County Council as the Highway Authority
The highway was flooded and the Highway Authority [Hertfordshire County Council] is responsible for draining the highway.

Environment Agency
The Environment Agency has powers and a regulatory role around main rivers and also provides flood warnings in certain areas.

District Council
The District Councils in Hertfordshire have powers to reduce the risk of flooding from ordinary watercourses, they lead local resilience forums when a major incident is declared, and have a flood risk management function via their role as the Local Planning Authority including the publishing of strategic flood risk assessments. Flooding as a nuisance can come under the remit of the Districts' environmental health teams.

Water company
TWUL manages the public surface water and foul water sewer networks in this area of Hertfordshire. TWUL manages flooding from their network in line with their business plan approved by OfWAT.

TWUL, like all water and sewerage companies, are required to keep a register of all instances of internal and external flooding of properties, this is referred to as the flood risk register. This register is used as the evidence to justify improvements to the surface water network.

Only TWUL has the authority to alter the surface water sewer and to manage the flood risk associated with it.

Internal Drainage Board
No Internal Drainage Board in this area.

Riparian Landowner(s)
Riparian landowners have a responsibility not to do or allow anything to unduly affect the flow of water in a watercourse which runs through their land. However, there are no watercourses in the area.

Other (delete if not necessary)

3.2. Functions exercised or proposed to be exercised

Hertfordshire County Council as the Lead Local Flood Authority

- Have carried out an investigation using their powers under Section 19 of the FWMA 2010 and written and published this report.
- The extent of the flooding was confirmed through resident questionnaires.

4. Recommendations

Properties in Drovers Way experienced internal flooding. The nature of summer thunderstorms like the one experienced in Hatfield in this flood event makes it incredible difficult to accurately warn members of the public that they could be at risk of imminent flooding and to either be prepared or to take action appropriate action. This is due to the many factors that are required to predict surface water flooding, such as accurately identifying where the rainfall will be at its most extreme and how saturated the catchment has been following proceeding rainfall. It is likely that any surface water flood warning service that could be offered would not have enough accurate data to be able to make informed decisions and would therefore lack the required confidence in the system. It would be likely that many false alarms would result and public perception on the reliability of the warning service would not be positive.

Due to the hazards and risks identified from this flood investigation at Drovers Way, an investigation should be led by the LLFA, working alongside the Housing Association and key stakeholders, to identify if any improvements could be made to improve the resilience response to the future risks posed from surface water at this location. This could be in the form of encouraging residents to receive Met Office weather warnings, or providing information of what to do during a flood event. The LLFA should work alongside flood resilience professionals to identify any preventative actions that could help residents in dealing with those hazards associated with surface water flood risk.

There are no other recommendations for the other Risk Management Authorities.