

January 2015

Buckinghamshire County Council

Flood Investigation Report

M25 and Fulmer Lane, Gerrards Cross, February 2014



Photos taken on 7th February 2014 courtesy of Transport for Buckinghamshire

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Revision Schedule

Buckinghamshire County council **Flood Investigation Report**

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1	12/12/2014	Draft for Review	Alex Back	Karen Fisher
2	19/12/2014	Final Draft for Comment	Alex Back	Karen Fisher
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Executive Summary

This report has been produced by Buckinghamshire County Council to investigate the flooding that occurred on the M25 and Fulmer Lane in Gerrards Cross on 7th February 2014. The report details the event and aims to improve responses to flood events in the future by making recommendations.

A section 19 investigation is a statutory requirement for Lead Local Flood Authorities (LLFA) required under the Flood and Water Management Act (FWMA) 2010. The LLFA in the area of Aylesbury is Buckinghamshire County Council. On becoming aware of a flood in its areas, a LLFA must, to the extent that it considers necessary or appropriate, investigate:

- which risk management authorities have relevant flood risk management functions; and
- whether each of those risk management authorities have exercised, or is proposing to exercise, those functions in response to the flood.

It is necessary to produce this report as the flood incident exceeded Buckinghamshire County Council's criteria for carrying out a Section 19 investigation with a Motorways, trunk roads and major rail links – 2 hours or more. 3 out of 4 lanes of the M25 were closed from X to Y on 7th February 2014.

This report will be available for public view and all Risk Management Authorities relevant to the flood event are aware of it.

The aim of the Section 19 investigation is to explain what happened in the flood event and what the Risk Management Authorities (RMAs) responsibilities were during the event. The recommendations are there to help the RMAs learn lessons from the event and to move forward with management of the flood risk in the future.

The flood on 7th February 2014 occurred after a long period (over 6 weeks) of above average rainfall leading to a saturated catchment and the road drainage system close to capacity. The high rainfall in the early hours on 7th February 2014 created too much surface water runoff for the surface water drains to convey away from the roads.

The main conclusions show that the heavy rain in the previous months resulted in a saturated catchment. Resources around the area were very stretched with different flood events. A combined effort from TfB and the Highways Agency cleared out the

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ditches along Fulmer Lane. Due to previous siltation of these ditches, they were unable to convey the surface water away from the area, which resulted in the flooding of the M25. Now that the ditches have been re-dug and TfB have committed to maintaining them such an event is less likely to occur in the future.

A list of recommendations is included in the report which is intended to ensure that the flood management, warning and response to events are improved going forward. All the RMAs will be involved in taking forward these recommendations.

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1. Introduction

1.1 Background to investigation

BCC as the LLFA has a responsibility to record and report flood incidents as detailed within Section 19 of the FWMA 2010:

Section 19

- (1) On becoming aware of a flood in its areas, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate-
 - (a) which risk management authorities have relevant flood risk management functions, and
 - (b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.
- (2) Where an authority carries out an investigation under subsection (1) it must-
 - (a) publish the results of its investigation, and
 - (b) notify any relevant risk management authorities.

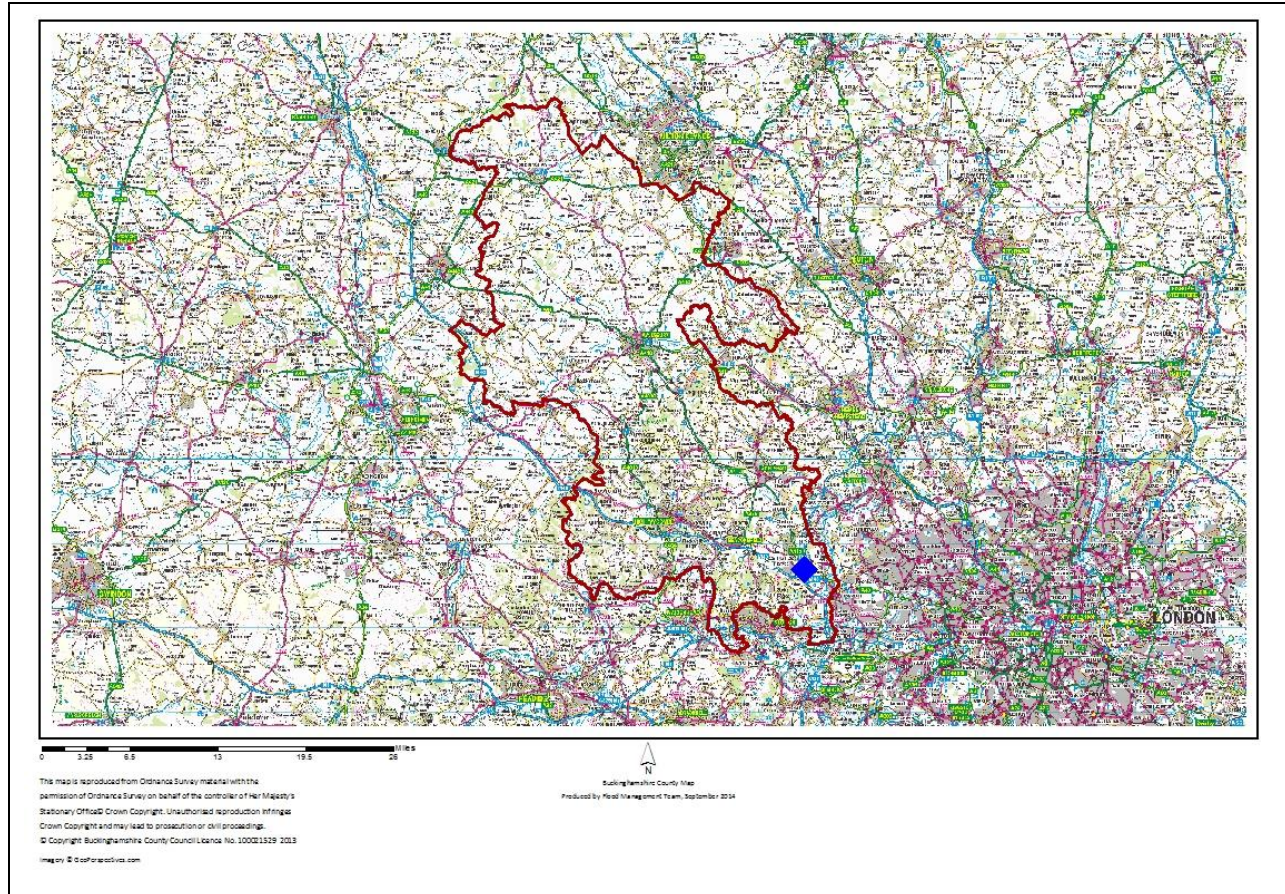
BCC has established criteria for section 19 flood investigations, which are in the appendix.

It is necessary to complete an investigation into the flood incident on M25 and Fulmer Lane, Gerrards Cross because it meets the following threshold: Motorways, trunk roads and major rail links – 2 hours or more.

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1.2 Site Location

Fulmer Lane is located in Gerrards Cross just to the west of the M25 as shown in Figure 1 (National Grid Reference 501527, 187100).



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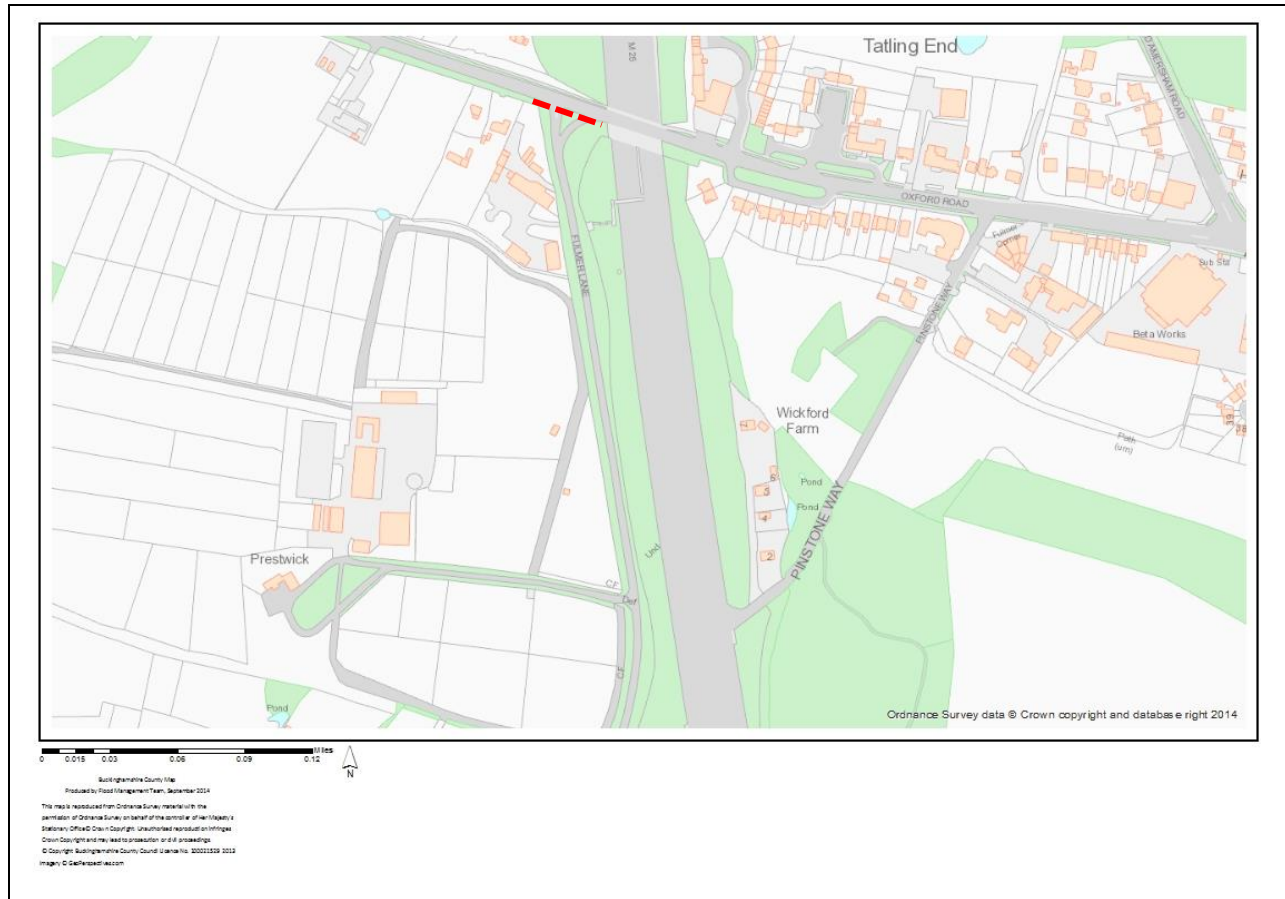


Figure 1 Location maps for Fulmer Lane, Gerrards Cross at County and local level – road closure marked by red dotted lines (Ordnance Survey License 100021529 2014)

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1.3 Drainage system and river network

Figure 2 shows the gullies and other drainage assets on Lower Road which form the surface water drainage system in the area.

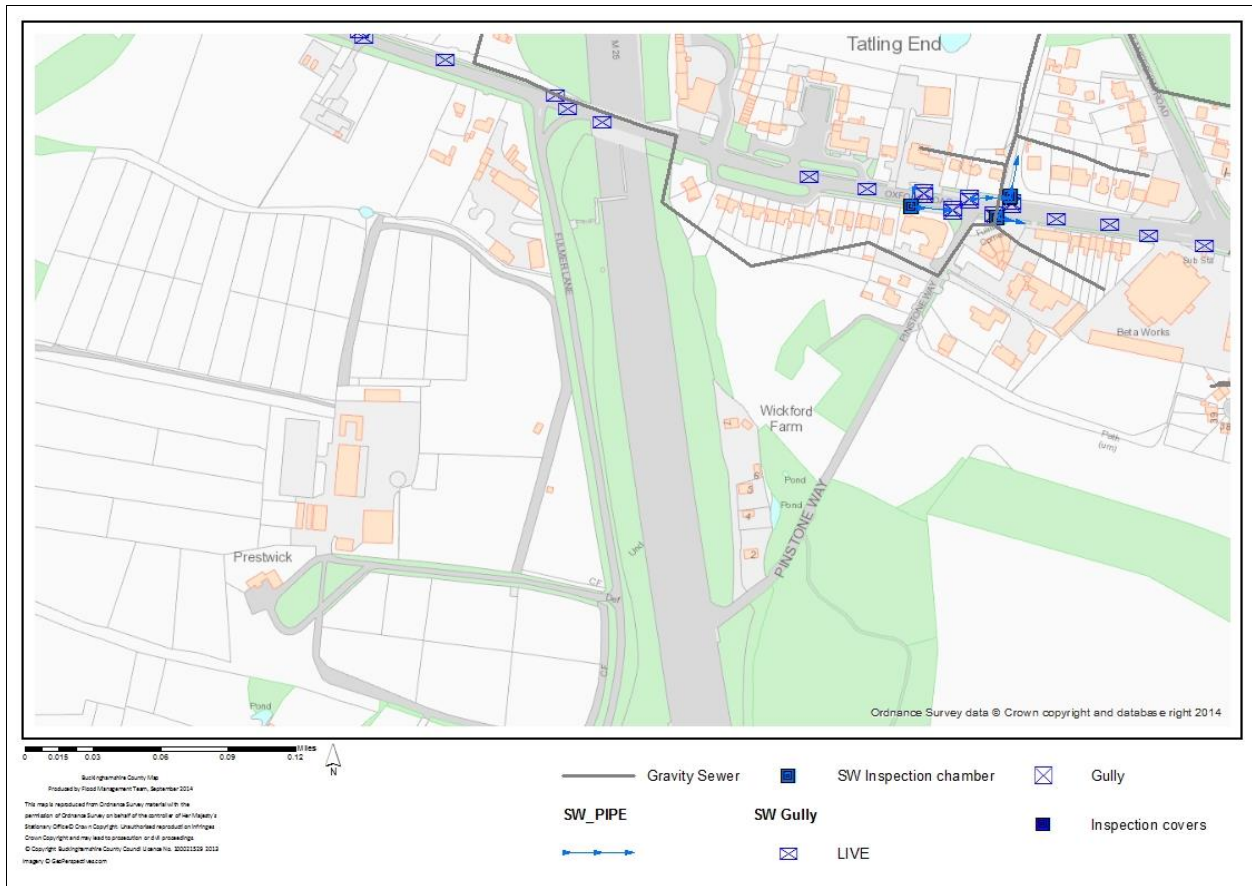


Figure 2 Map showing drainage infrastructure in Fulmer Lane, Gerrards Cross

2. Background

2.1 Catchment characteristics

Figures 3 and 4 below show the surface water flood maps for the Fulmer Lane area. The surface water flooding in different events shows the different depths of flooding in 1 in 100 year (fig 3) and 1 in 1000 year (fig 4). The surface water flooding would occur when extreme rainfall falls on the ground and cannot flow into the rivers as the river is either full and/or the volumes of water are too great for the drainage pipes leading to the river. Figures 3 and 4 also highlight the flow path that the surface water took in the absence of the maintain ditch system, building up the west of Fulmer lane then flow over Fulmer Lane and down the embankment on to the M25.

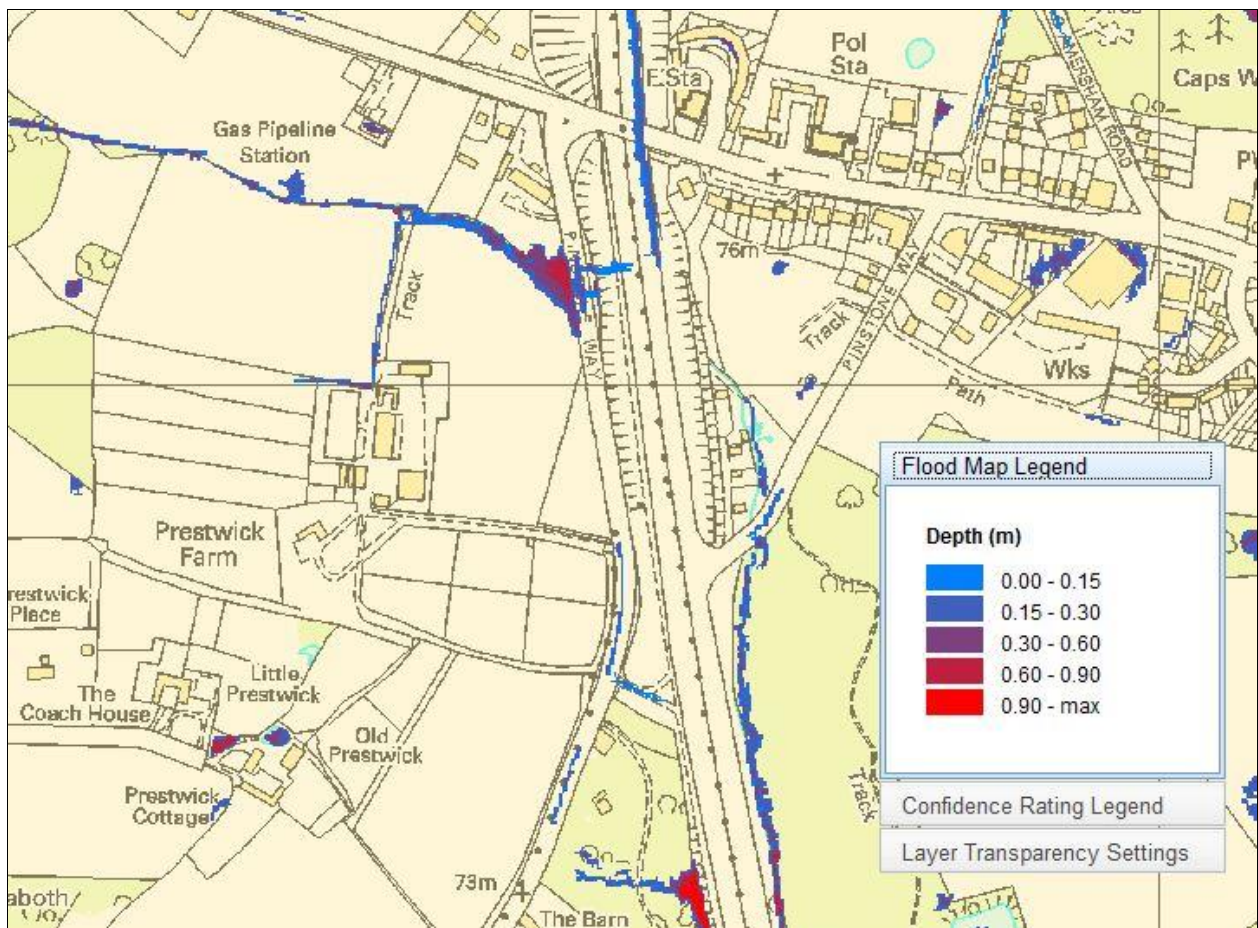


Figure 3 1:100 year Surface Water flood map showing predicted depth in the Fulmer Lane area (EA, 2013)

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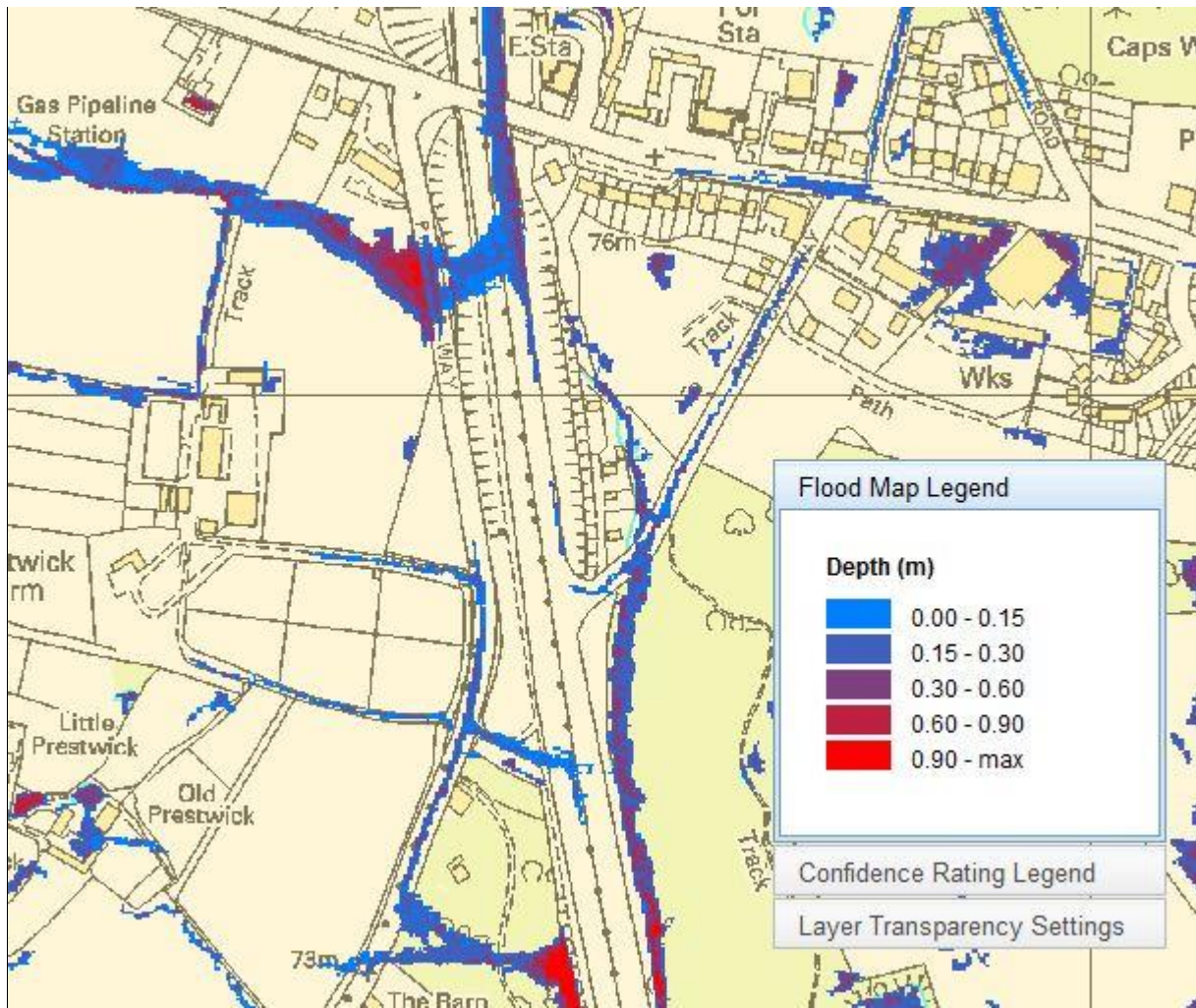


Figure 4 1:1000 year Surface Water flood map showing predicted depth in the Fulmer Lane area (EA, 2013)

2.2 Previous flood events

There are no previous flood events recorded by the County or District Councils at this location.

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3. Analysis of 7th February 2014 flood event

3.1 Conditions at the time

Rainfall during December 2013, January and early February 2014 meant that the whole catchment was saturated. This meant that when the rain fell during the flood events it ran-off the land straight onto the road and into the little capacity that was left in the ditches.

The Environment Agency rain gauge at Iver Heath is the closest daily rainfall recorder for this flood event and the results from this station are shown in figures 5 and 6. Figure 5 shows the rainfall from January to March 2014 and figure 6 shows the heavy rainfall events experience at the beginning of February. On the night of 6th February 20mm of rain fell which will have triggered the flooding in this area.

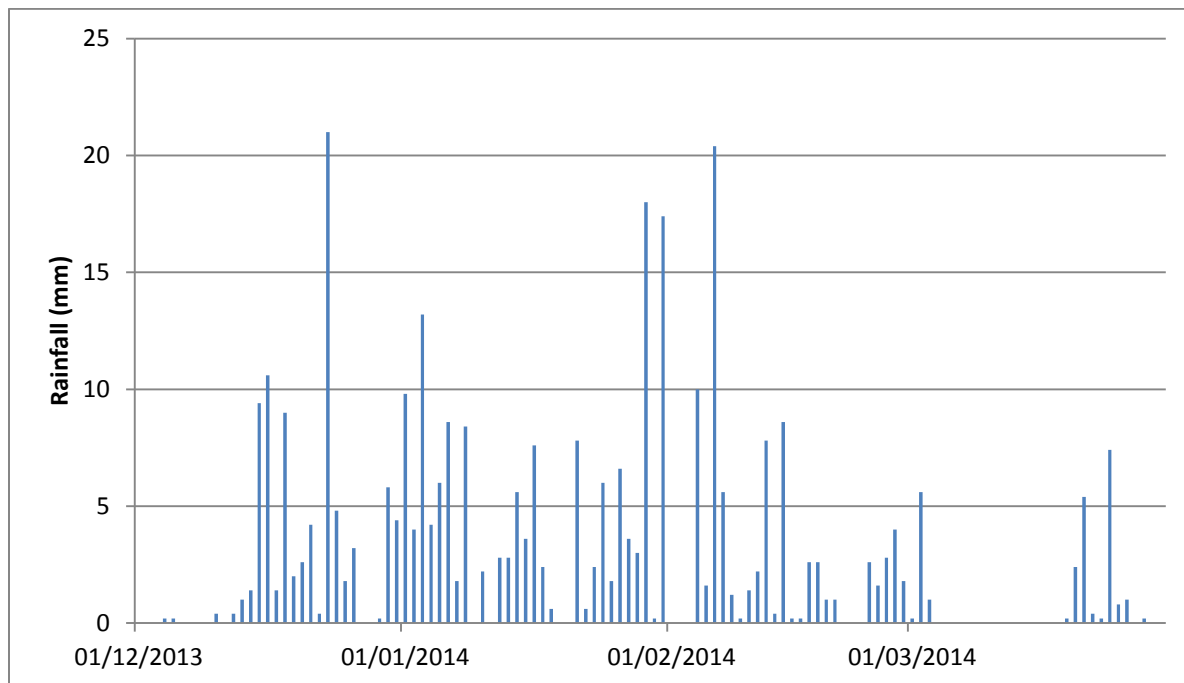


Figure 5: Rainfall at Iver Heath rain gauge from December 2013 to March 2014

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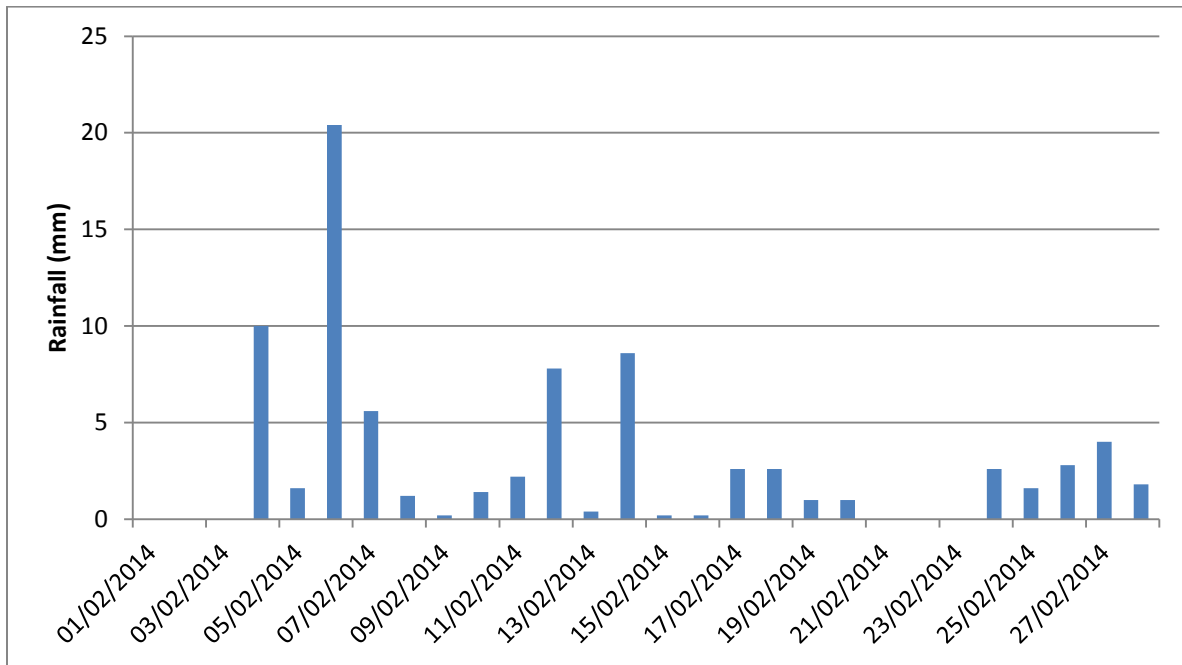


Figure 6: Rainfall at Iver Heath rain gauge from December 2013 to March 2014

3.2 Condition of features

The ditches in Fulmer Lane were heavily silted which, when combined with the heavy rainfall, caused Fulmer Lane and in turn the M25 to flood.

3.3 What happened?

The heavy rainfall preceding and on 6th February as shown in figures 5 and 6 overwhelmed the drainage system this was exacerbated by the heavily silted ditches on both sides of Fulmer Lane. This resulted in the surface water not flowing along the Fulmer Lane ditches and instead it flowed down the embankment and onto the M25 causing lane closures.

3.4 Possible causes

Conditions of pipes, gullies and culverts

As mentioned above the ditches in Fulmer Lane were silted heavily and this will have contributed to the lack of conveyance of surface water away from the M25.

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3.5 Incident response

Fulmer Lane, Gerrards Cross was closed during the flood event for maintenance work to be carried out to the ditches by Transport for Buckinghamshire and the Highways Agency. The exact details for the response from Transport for Buckinghamshire has yet to be received and are therefore not detailed in this report.

The Highways Agency have been contacted for details on their response to the event and the timings for the M25 lane closures but these details have yet to be received and are therefore not detailed in this report.

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4. Responsible Authorities and landowners

There are different responsibilities for flood management depending on the type of flooding. Organisations responsible for flooding are Risk Management Authorities (RMAs) and their responsibilities are detailed below. Riparian landowners also have responsibilities for watercourses across their land and these are detailed below. These are summaries of the details included in the Buckinghamshire County Councils Local Flood Risk Management Strategy (2013-2018).

4.1 Lead Local Flood Authority

The Lead Local Flood Authority in this area is Buckinghamshire County Council. Buckinghamshire County Council has a role as a RMA in coordinating management of local flood risk from surface water, ground water and ordinary watercourses in the county.

4.2 South Buckinghamshire District Council

South Buckinghamshire District Council have responsibilities to inspect and maintain watercourses on District Council land, respond to requests for assistance during flood events and have the power, if instructed by Buckinghamshire County Council, to carry out flood risk management work which will benefit management of surface runoff, groundwater and ordinary water courses.

4.3 Environment Agency

The Environment Agency is one of the RMAs as defined by the Flood and Water Management Act 2010. Protecting the river environment and managing flood risk is part of their job. The EA is the RMA for flooding from main rivers.

4.4 Highways Authority – Transport for Buckinghamshire and Highways Agency

The Highways Authority, which is BCC, manages any flooding from highways and TfB manages the highways function. On this occasion the water flooded the M25 so the Highways Agency were also involved in the incident response.

4.5 Water Utility Company – Thames Water

Thames Water is responsible for flooding from foul sewers and surface water sewers, which they own. Whilst undertaking this they must manage flood risk from sewers

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4.6 Landowners and riparian owners

Landowners and riparian owners must maintain any culvert, or the bed and banks of any adjacent watercourse. They should clear away any debris from the watercourse or culvert even if it did not originate from their land.

Riparian owners can find further guidance on their responsibilities as landowners in the Environment Agency document 'Living on the Edge' which can be found online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297423/LIT_7114_c70612.pdf.

4.7 Residents

Residents have a responsibility to take measures to protect themselves and their property when flooding is imminent.

4.8 Emergency Responsibilities

The emergency responsibilities are outlined in table 1 below. Please note that Parish and Town Councils do not have a legal obligation to respond to emergencies. Whatever service they provide is voluntary and unique to each Parish or Town Council.

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Table 1 Roles and responsibilities in an emergency, during and after a flood event

<p>Local (County and District) Authorities</p> <ul style="list-style-type: none"> • Coordinate emergency support within their own functions • Deal with emergencies on 'non main rivers' • Coordinate emergency support from the voluntary sector • Liaise with central and regional government departments • Liaise with essential service providers • Open rest centres • Manage the local transport and traffic networks • Mobilise trained emergency social workers • Provide emergency assistance • Deal with environmental health issues, such as contamination and pollution • Coordinate the recovery process • Manage public health issues • Provide advice and management of public health • Provide support and advice to individuals • Assist with business continuity 	
<p>Police Force</p> <ul style="list-style-type: none"> • Save life • Coordination and communication between emergency services and organisations providing support • Coordinate the preparation and dissemination <p>Fire and Rescue Service</p> <ul style="list-style-type: none"> • Save life rescuing people and animals • Carry out other specialist work, including flood rescue services • Where appropriate, assist people where the use of fire service personnel and equipment is relevant <p>Ambulance Service</p> <ul style="list-style-type: none"> • Save life • Provide treatment, stabilisation and care at the scene 	<p>Utility Providers</p> <ul style="list-style-type: none"> • Attend emergencies relating to their services putting life at risk • Assess and manage risk of service failure • Assist with recovery process, that is, water utilities manage public health considerations <p>Internal Drainage Board</p> <ul style="list-style-type: none"> • Operate strategic assets to reduce flood risk in partnership with RMAs and public <p>Town and Parish Councils</p> <ul style="list-style-type: none"> • Support emergency responders • Increase community resilience through support of community emergency plan development <p>Voluntary services</p> <ul style="list-style-type: none"> • Support rest centres • Provide practical and emotional support to those affected • Support transport and communications • Provide administration • Provide telephone helpline support
<p>Environment Agency</p> <ul style="list-style-type: none"> • Issue Flood Warnings and ensure systems display current flooding information • Provide information to the public on what they can do before, during and after a flood event • Monitor river levels and flows • Work with professional Partners and stakeholders and respond to requests for flooding information and updates • Receive and record details of flooding and related information • Operate water level control structures within its jurisdiction and in line with permissive powers • Flood event data collection • Arrange and take part in flood event exercises • Respond to pollution incidents and advise on disposal • Assist with the recovery process, for example, by advising on the disposal of silt, attending flood surgenes 	

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5. Conclusions and recommendations

5.1 Conclusions

- There was high rainfall on the night of 6th/7th Feb.
- Catchment was saturated due to wet conditions in preceding three months.
- Fulmer Lane and part of the M25 were flooded because of the heavy rainfall and the heavily silted ditches located along both sides of Fulmer Lane.

5.2 Recommendations

Authority/Stakeholder	Recommended Action
Bucks CC	Ensure that owners of culverts, watercourses and drainage infrastructure are aware of their responsibilities.
TfB	<ul style="list-style-type: none">• Continue to clear and maintain the surface water ditches, drains and gullies in Fulmer Lane as part of their ongoing maintenance schedule.• Ensure that road closures are enforced in partnership with the police.• Work closely with the Highways Agency if their assets or work impacts Highway Agency assets or work.
Highways Agency	Work closely with TfB during emergencies.

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Explanation of Acronyms

Acronym	Definition
Bucks CC	Buckinghamshire County Council
BCC	Buckinghamshire County Council
AVDC	Aylesbury Vale District Council
EA	Environment Agency
TfB	Transport for Buckinghamshire
LLFA	Lead Local Flood Authority
RMA	Risk Management Authority
FWMA	Flood and Water Management Act 2010
IDB	Internal Drainage Board
BFRS	Buckinghamshire Fire and Rescue Service
NGR	National Grid Reference
BGS	British Geological Survey
STW	Sewage Treatment Works

References

Reference in Document	Refers to
EA, 2013	uFFMS http://www.ufmfsw.com

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Contacts

Lead Local Flood Authority



Flood Management Team
Buckinghamshire County Council
County Hall
Walton Street
Aylesbury
Bucks HP20 1UY

Telephone: 084537 08090

Email: FloodManagement@buckscc.gov.uk

Website: www.buckscc.gov.uk/flooding

Environment Agency



**Environment
Agency**

National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY

Telephone: 03708 506506

Email: enquiries@environment-agency.gov.uk

Website: <http://www.gov.uk/government/organisations/environment-agency>

District Council



South Bucks
District Council

South Bucks District Council
Capswood, Oxford Road
Denham, UB9 4LH
Telephone: 01895 837200

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Highways Authority

Transport for Buckinghamshire

Telephone: Transport and roads – 0845 2302882

Out of hours emergencies (Highways) – 01296 486630

Email: tfb@buckscc.gov.uk

Website: <http://www.transportforbucks.net/Transport-and-roads.aspx>

Water Utility



Thames Water

PO Box 286

Swindon

SN38 2RA

Telephone: 0845 9200 800

Website: <http://www.thameswater.co.uk/help-and-advice/16739.htm>

Emergency Response

Buckinghamshire Fire and Rescue Service

Address: Buckinghamshire Fire & Rescue Service, Brigade HQ, Stocklake, Aylesbury, Bucks, HP20 1BD

Telephone: 01296 744400

Website: <http://www.bucksfire.gov.uk/BucksFire/Contact+Us/>

Thames Valley Police

Telephone: 101 in non-emergency, 999 in emergency

Website: <http://www.thamesvalley.police.uk/contactus-phone.htm>

Buckinghamshire Ambulance Service

Telephone: 111 in non-emergency, 999 in emergency

Website: <http://www.southcentralambulance.nhs.uk/content/press-release/buckinghamshire/flooding-advice.ashx>

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Appendices

Appendix A: BCC criteria for a Section 19 Investigation

- Internal flooding (including to basements) to five or more residential properties within an area of 1km²
- Internal flooding of two or more business premises within an area of 1km²
- Internal flooding (including to basement) of at least one property for one week or longer
- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.
- Caused a transport link to be impassable for the following periods:
 - Motorways, trunk roads and major rail links – 2 hours or more
 - Class A and B highways and other railway links – 4 hours or more
 - Class C highways – 10 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours
 - Class U highways – 24 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours
- Any flooding event that a risk management authority deems significant does not meet the agreed thresholds should be brought to the next strategic flood management committee for consideration.