Section 19 Flood Investigation Report: Surrey Heath

28 October 2015

SURREY

Section 19 Report

Purpose

This document has been prepared specifically for the purpose of meeting the requirements of Section 19 of the Flood and Water management Act 2010.

The report investigates which risk management authorities (RMAs) had relevant flood risk management functions during the flooding that took place in the winter of 2013/14. The report also considers whether the relevant RMAs have exercised, or propose to exercise, their flood risk management functions. It does not address wider issues beyond that remit

The Section 19 data has been put together based on records of internal property flooding and road closure information from a variety of sources. While every effort has been made to verify the locations of the Section 19s identified, the nature of the data and the methods used to collate this information mean that it does not include every occurrence of flooding. This data only identifies where flooding has been reported and is indicative only.

Location Name	Surrey Heath; Camberley and Lightwater
Date(s) of Incidents	Winter 2013/14
Section 19 Trigger(s)	Internal property flooding at multiple addresses Road closures

Glossary

The table below defines some of the frequently used terminology within the flood risk management industry and within this document.

Acronym/Term	**Definition**
Annual Probability	Throughout this document, flood events are defined according to their likelihood of occurrence. The term 'annual probability of flooding' is used, meaning the chance of a particular flood occurring in any one year. This can be expressed as a percentage. For example, a flood with an annual probability of 1 in 100 can also be referred to as a flood with a 1% annual probability. This means that every year there is a 1% chance that this magnitude flood could occur.
EA	Environment Agency
Flooding Asset Register	The register is a record of all structures or features designated by the Environment Agency, the Lead Local Flood Authority, the district and borough councils or the Internal Drainage Board which have an effect on flood risk. More information on the Flooding Asset Register can be found on SCC's website and in Schedule 2 of the Flood and Water Management Act (2010).
Flood Risk Management Function	A flood risk management function is a function listed in the Act (or related Acts) which may be exercised by a risk management authority for a purpose connected with flood risk management.
Very Low Flood Risk	Area with a very low probability of flooding from rivers (< 1 in 1,000 annual chance of flooding or <0.1%).
Low Flood Risk	Area with a low probability of flooding from rivers (between a 1 in 1000 and 1 in 100 annual chance of flooding or between 0.1% and 1%)
Medium Flood Risk	Area with a medium probability of flooding from rivers (between a 1 in 100 and 1 in 30 annual chance of flooding or between 1% and 3.33%).
High Flood Risk	Area with a high probability of flooding from rivers (> 1 in 30 annual chance of flooding or greater than 3.3%).
IDB	Internal Drainage Board
IDD	Internal Drainage District
Instances of property flooding	This is a count of the reported incidents of internal property flooding that occurred across Winter 2013/2014. This means that properties which were flooded twice are accounted for

	twice. It is therefore not a count of the number of properties.
LLFA	Lead Local Flood Authority
Main River	Main Rivers are usually larger streams and rivers, but some of them are smaller watercourses of local significance. Main Rivers indicate those watercourses for which the Environment Agency is the relevant risk management authority.
Ordinary Watercourse	Ordinary Watercourses are displayed in the mapping as the detailed river network. An Ordinary Watercourse is any watercourse (excluding public sewers) that is not a Main River, and the Lead Local Flood Authority, District/Borough council or Internal Drainage Board are the relevant risk management authority.
SHBC	Surrey Heath Borough Council
RMA	Risk Management Authority
SCC	Surrey County Council
TW	Thames Water
uFMfSW	Updated Flood Maps for Surface Water

Sources of Flooding

The following report considers the flooding which occurred in the winter of 2013-14. The table below describes different sources of flood risk.

Source	Description
Fluvial flooding	Exceeding of the flow capacity of river channels (whether this is a Main River or an Ordinary Watercourse), leading to overtopping of the river banks and inundation of the surrounding land. Climate change is expected to increase the risk of fluvial flooding in the future.
Tidal flooding	Propagation of high tides and storm surges up tidal river channels, leading to overtopping of the river banks and inundation of the surrounding land.
Surface water flooding	Intense rainfall exceeds the available infiltration capacity and / or the drainage capacity leading to overland flows and surface water flooding. Climate change is expected to increase the risk of surface water flooding in the future. This source is also referred to as pluvial flooding.
Groundwater flooding	Emergence of groundwater at the surface (and subsequent overland flows) or into subsurface voids as a result of abnormally high groundwater flows, the introduction of an obstruction to groundwater flow and / or the rebound of previously depressed groundwater levels.
Sewer flooding	Flooding from sewers is caused by the exceeding of sewer capacity and/or a blockage in the sewer network. In areas with a combined sewer network system there is a risk that land and infrastructure could be flooded with contaminated water. In cases where a separate sewer network is in place, sites are not sensitive to flooding from the foul sewer system.
Other sources of flood risk	Flooding from canals, reservoirs (breach or overtopping) and failure of flood defences.

Flood Risk Data Sources

The following sources of data have been used in preparing this report and its associated mapping:

- Fluvial Flood Risk
    - Flood Risk Mapping (Risk of Flooding from Rivers and Sea; EA)
    - Flood Warning and Alert areas (EA)
- Surface Water Flood Risk
    - Updated Flood Maps for Surface Water (uFMfSW) (EA)
- Groundwater
    - Susceptibility to Groundwater Flooding (British Geological Survey)
- Historic Flood Evidence
    - Historic Flood Map (EA)
    - Wetspots (SCC)
    - Property Flooding Database (SCC)
    - Historic Flooding Incidents Database (SCC)

If you are aware of any historical flooding in the area which is not highlighted on the mapping please report it, with any evidence you have (for example photos or videos), to flooding.enquiries@surreycc.gov.uk.

Other Data Sources

The following sources of data have been used in preparing this report and its associated mapping:

- Geological information
    - Superficial geology (Geology of Britain Viewer; British Geological Survey)
    - Bedrock geology (Geology of Britain Viewer; British Geological Survey)

Contents

1. Executive Summary

The purpose of this report is to investigate which risk management authorities (RMAs) had relevant flood risk management functions during the flooding that took place within the boundary of Surrey Heath Borough Council (SHBC) in the winter of 2013/14. The report also considers whether the relevant RMAs have exercised, or propose to exercise, their risk management functions (as per Section 19(1) of the Flood and Water Management Act 2010). It does not address wider issues beyond that remit.

The flooding experienced in Surrey Heath was a combination of both fluvial and surface water runoff. This was caused by unprecedented rainfall during the winter 2013/14 period (275% compared with an average winter). There were approximately 6 incidents of property flooding in Surrey Heath during winter 2013/14.

The Environment Agency (EA) is the lead RMA for incidents of fluvial flooding from Main Rivers, though Thames Water (TW), Surrey County Council (SCC) and SHBC also performed other functions during that event, some of which were under different legislation including the Civil Contingencies Act 2004 and the Water Industry Act 1991. The actions of the authorities are summarised below:

1.1. Environment Agency

- Operated Flood Alert and Flood Warning service.
- Set up Command stations at Surrey Police Headquarters to respond to the flooding across Surrey.

1.2. Thames Water

- Main focus during event was on maintaining customer services, on protecting assets vital for the ongoing delivery of service, and on ensuring that where there was disruption, normal service was able to resume as soon as possible.

1.3. Surrey County Council

- Closed roads temporarily for public safety during the flooding.
- Operated a call centre throughout the flooding which dealt with residents queries and have since hired a Community Resilience Officer to support communities in becoming more resilient to flooding amongst other issues.
- Administered the Repair and Renew Grant which provided up to £5000 for residents and businesses that were flooded in order to protect their property from flooding in the future.
- Published the LFRMS in December 2014

1.4. Surrey Heath Borough Council

- No flood risk management functions relevant to this flood event were identified for SHBC.

2. Introduction

2.1. Section 19 Investigation Requirement

Under the Flood and Water Management Act 2010 the Lead Local Flood Authority (LLFA) must (to the extent that it considers is necessary or appropriate) undertake an investigation upon becoming aware of a flood incident within its area.

A LLFA is defined under Section 6(7) of the Flood and Water Management Act as being the County Council for that area. Section 19(1) requires that the investigation determines the RMAs that have relevant flood risk management functions and whether each of those authorities have exercised or propose to exercise those functions.

Section 19(2) requires that the LLFA publishes the results of its investigation and notify the relevant RMAs accordingly.

This report covers flooding during the winter of 2013/14 only. As flooding was widespread across Surrey, multiple reports have been produced.

2.2. Locations of the investigations

This report addresses sites that flooded within the SHBC area. There are seven sites in total, spread across two sub areas. There were approximately 10 incidents of internal property flooding in Surrey Heath.

Due to the sensitivities in publishing property flooding information, this report does not contain a comprehensive list of the S19 sites but supporting maps showing the sub areas in more detail are available.

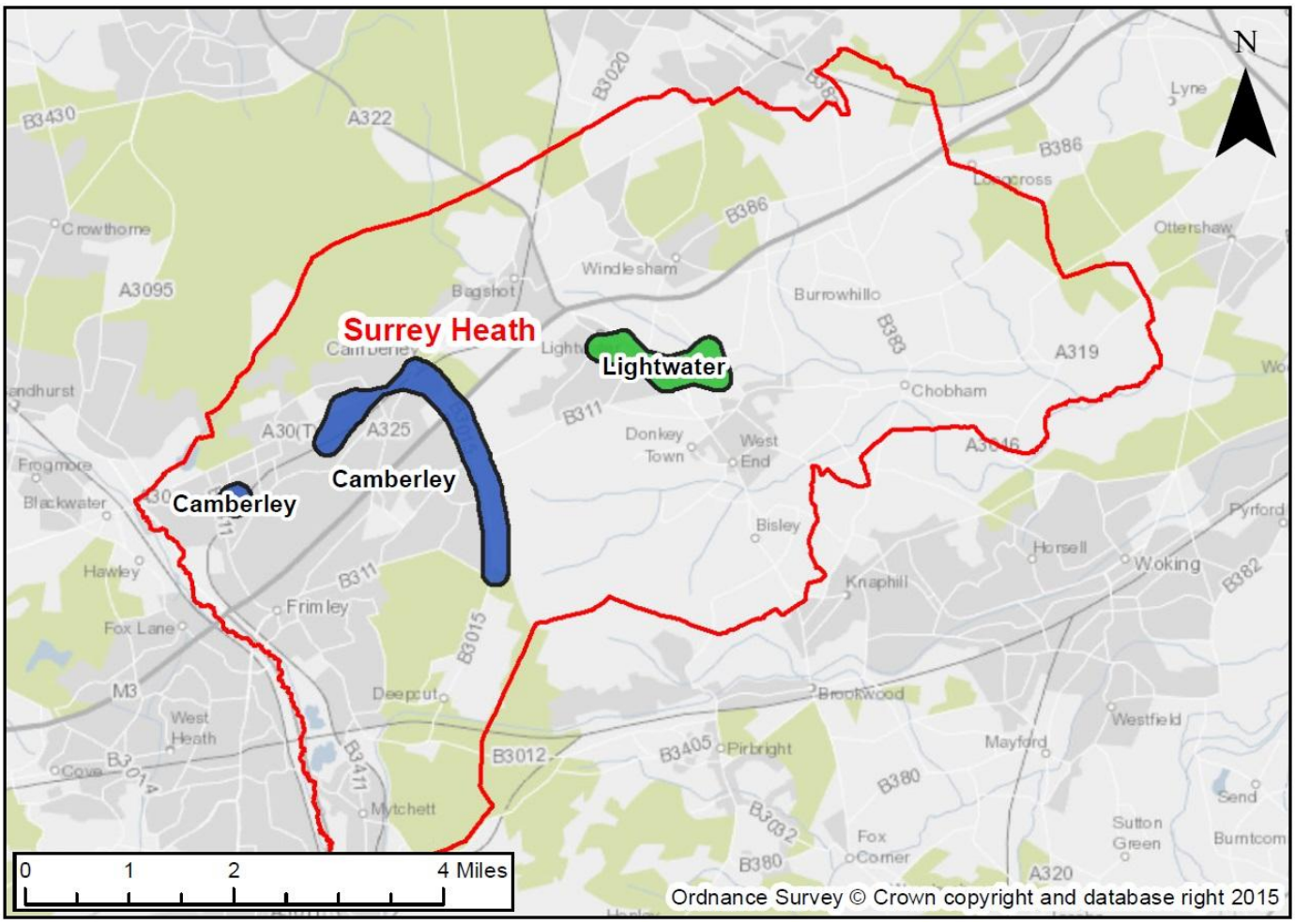

Figure 2-1 Location of Sub areas within Surrey Heath for this report

3. Background Weather Conditions

3.1. Weather Conditions

The winter as a whole, from the beginning of December until the end of February, was the wettest recorded in the UK since records began in 1766.

The overall amount of rainfall recorded during the winter of 2013/14 was exceptional: on average, 446mm across the South East of England. This set new records for each of the individual months and for the season as a whole. The totals represented a significant proportion of the average annual rainfall. **Error! Reference source not found.** Table 3-1 indicates that parts of South East England received around two and a half times the amount of rainfall that they would normally expect at this time of year. This caused wide-spread flooding across Surrey from a range of sources including groundwater. In some areas of South East England they exceeded records set in 2000/01, the last time significant disruption from flooding was recorded.

Table 3-1 Winter 2013-14 rainfall compared to long term average

County	Winter 2013/14 rainfall (mm)	Winter long term average rainfall (mm)	Winter 2013/14 rainfall compared with winter average
Oxfordshire	350	170	205%
Berkshire	415	190	220%
Hampshire	570	225	255%
Surrey	560	205	275%
Buckinghamshire	420	185	230%

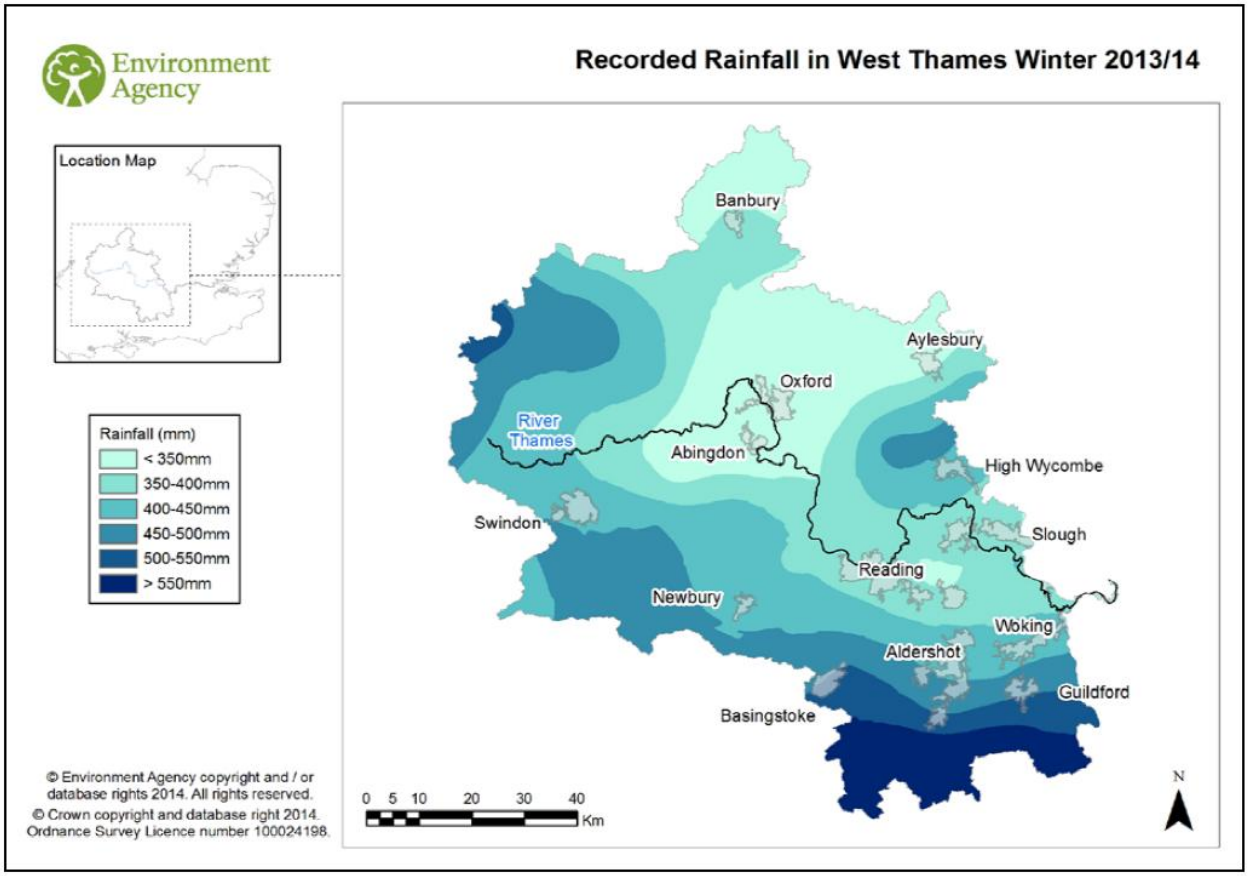

Figure 3-1 Recorded Rainfall in the Environment Agency West Thames Region 2013-14

Storm events hit the UK on the 18 to 19, 23 to 27 and 30 to 31 December 2013, followed by 3 and 5 January 2014.These storms came from the Atlantic and were characterised by unusually large and deep areas of low pressure, which brought rainfall and very strong winds. The period was also notable for the absence of exceptional rainfall from any single storm during January and February 2014. The highest daily total for each month recorded at any of the EA's 41 rain gauges across West Thames was 57mm in December, 37mm in January and 28mm in February. However the combined effect of prolonged rain falling on saturated ground led to widespread flooding across Surrey.

3.2. Catchment Conditions

There are three main catchments that fall within the SHBC area: the Blackwater which drains the western part of the Borough, and the Mill Bourne and Addlestone Bourne which drain the eastern part.

The Camberley sub area lies within the Blackwater catchment and the Lightwater sub area lies within the Mill Bourne catchment. The Mill Bourne is also known locally as the Hale Bourne and/or Windle Brook.

After a relatively average autumn, the storm event of 23 December resulted in approximately 60mm of rainfall recorded over an 18-hour period at the Cranleigh Waters EA gauge, south of Guildford. This caused the peak flows in the River Wey and subsequent flooding. On the lower reaches of the River Wey (Byfleet, Old Woking and Weybridge), the highest levels were reached on Boxing Day. River levels rose 2.5m above normal winter levels in Guildford, although they did not quite match the levels of November 2000.

Water levels along the River Wey and Blackwater River rose again on New Year's day but they did not exceed those reached over the Christmas period. The cumulative effects of rainfall over a number of days however meant that river levels remained high and the catchments ability to absorb and route more rainfall in subsequent events was reduced, meaning that flooding started to occur after relatively small rainfall events.

4. Identification of Relevant Risk Management Authorities

There are a range of RMAs which together cover all sources of flooding.

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion in England and Wales. They have prepared strategic plans which set out how to manage risk, provided evidence (for example their online flood maps), and provided advice to the Government. They provide support to the other RMAs through the development of risk management skills and provide a framework to support local delivery. The EA also has operational responsibility for managing the risk of flooding from Main Rivers, reservoirs, estuaries and the sea, as well as being a coastal erosion RMA. Main rivers are classified by the Environment Agency in consultation with RMA and the public. They are defined on a map held on the Environment Agency website which is reviewed and updated annually. These tend to be the larger rivers and streams in the country and the EA have permissive powers to carry out maintenance works on them.

LLFAs are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas. As part of this, the LLFA liaises regularly with the EA as well as the other RMAs to ensure that all sources of flooding in their area are being properly managed. They are required to produce reports when there is a reported flood incident, and they have to keep a register of flood management assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and Ordinary Watercourses. Ordinary Watercourses are all rivers and streams which are not designated as ‘Main Rivers’.

District and Borough Councils can carry out flood risk management works on minor watercourses, working with the LLFA. Through the planning processes, they control development in their area, ensuring that flood risks are effectively managed. If they cover part of the coast, then District, Borough and Unitary Councils also act as coastal erosion RMA.

Internal Drainage Boards (IDB) are responsible for water level management in low lying areas. Not all areas require an IDB, and they currently cover approximately 10% of England. They work in partnership with other authorities and land owners to actively manage and reduce the risk of flooding within the Internal Drainage District (IDD).

Water and sewerage companies are responsible for managing the risks of flooding from drainage systems, including both their surface water only systems and combined sewer systems.

Highway Authorities are responsible for providing and managing highway drainage and roadside ditches, and must ensure that road projects do not increase flood risk.

Table 4-1 below summarises the RMAs responsible for the sites within this report. The ticks indicate which authorities have responsibility for which function. SCC is the LLFA and TW is the water company that has responsibility for all sources of sewer flooding. There are no IDBs in Surrey Heath.

Table 4-1 Risk Management Authorities

Flood Source	Environment Agency	Lead Local Flood Authority	Land Drainage Authority		Water Company	Highway Authority
		Surrey County Council		Borough or District Council	Thames Water	Surrey County Council
Main River	✓					
Surface Water		✓				✓
Surface Water (on or coming off the highway)						✓
Sewer flooding					✓	
Ordinary Watercourse			✓	✓		
Groundwater		✓				
Reservoirs	✓					

5. Strategic Actions and Flood Risk Management Functions

RMAs have defined flood risk management functions under the Flood and Water Management Act (2010). A flood risk management function is a function listed in the Act (or related Acts) which may be exercised by an RMA for a purpose connected with flood risk management. The following section sets out the strategic actions and relevant flood risk management functions that were carried out before, during and after the flooding that occurred across Surrey and particularly in Surrey Heath during the winter of 2013/14.

Environment Agency

The EA have a number of flood risk management functions, which include (but are not limited to); undertaking and maintaining flood mitigation works/defences, strategic responsibility for managing the risk of reservoir flooding, consenting and enforcement, the provision of strategic flood risk management plans, operation of flood alerts, flood warnings and flood risk management assets and designation of structures and features that affect flood risk. The relevant functions undertaken are listed below:

- Operated Flood Alert and Flood Warning service.
- Operated flood risk management assets during the flooding.
- Carried out flood risk mitigation works.

In addition, the EA carried out the following actions across the County:

- Participated in the Strategic and Tactical Command Groups once a major incident had been declared to respond to the flooding across Surrey.
- Cleared 860 blockages and storm damage incidents.
- Reported 1087 pollution incidents.
- 125 Flood Ambassadors visited 95 locations.
- 70 flood data recorders sent to more than 100 locations.
- Supported (and are supporting) community groups to help develop their community flood/emergency plans.
- Sent out newsletters to inform residents of their site investigation works and are finalising plans for a regular community newsletter.
- Met with local people to discuss their ideas and are now studying these proposals in more detail.

Thames Water

TW have flood risk management functions under the Water Resources Act (1991). Relevant actions of water companies include: the inspection, maintenance, repair and any works to their drainage assets which may include watercourses, pipes, ditches or other infrastructure such as pumping stations.

No specific flood risk management functions have been identified as being directly relevant to the 2013/2014 flooding incident in Surrey Heath. However, this investigation has identified other relevant actions carried out by TW which are described below.

TW put in place winter arrangements for responding to winter weather conditions. This included triggers for the scaling up of resources and management for a range of foreseeable weather conditions. During the event their main focus was on maintaining customer services, on protecting

assets vital for the ongoing delivery of service and on ensuring that where there was service disruption they were able to resume it as soon as possible. To these ends TW carried out the following actions within Surrey:

- Physical protection measures – deployment of flood barriers and sandbags to TW sites (both water and wastewater).
- Regular (often daily) physical checks of unmanned sites to ensure that they were working and in workable condition.
- Optimisation of use of the sewerage network – where possible work such as investigations and sewer cleaning was carried out to ensure that sewers and pumping stations were working to optimum capacity.
- Increased the number of engineers and staff on the ground to investigate flooding reports - Network Engineers visited internally flooded properties where sewer flooding was the primary cause.
- Undertook wide scale clean ups of properties regardless of whether the cause was foul or river flooding.
- Provided a sewer flooding information leaflet for general distribution to properties affected and attended a number of local flood meetings.
- Provided support to Affinity Water with risk assessments and contingency planning for their sites in Surrey that were at risk of inundation.

Surrey County Council

SCC, as LLFA, have flood risk management functions, which include (but are not limited to): the provision of a Local Flood Risk Management Strategy (LFRMS), designation and maintenance of a register of structures or features that have a significant effect on flood risk, consenting and enforcement works on ordinary watercourses, undertaking works to mitigate surface water and groundwater flooding and undertaking Section 19 investigations. SCC also has responsibilities as a Highways Authority and as an Emergency Responder (under the Land Drainage Act 1991 and the Civil Contingencies Act 2004 respectively) which may relate to flooding. Surrey's relevant flood risk management functions undertaken in Surrey Heath are listed below:

- The LFRMS was published in December 2014.
- Some key drainage assets have been identified in Surrey Heath and added to the Flooding asset register.
- Section 19 reports have been produced for the flooding experienced across the county in Winter 2013/14.

In addition SCC carried out the following activities across Surrey;

- SCC officers inspected flood affected roads, after which defect repairs were undertaken by SCC's contractors; Kier. Where extensive areas of carriageway were damaged by the flooding, they were assessed for inclusion into the Project 400 programme; a targeted programme to resurface and repair roads which were damaged by the Winter 2013/14 floods.
- All flood affected roads in Surrey were assessed for potential schemes which may be included in the Project 400 programme.
- SCC cleansed and re-opened roads as quickly as possible after the flooding.
- Surrey Fire and Rescue Service (SFRS) pumped flood waters away to protect residents, property and infrastructure during the flooding.
- The Surrey Strategic and Tactical Coordination Groups met for a response meeting in advance of the February 2014 event to set up coordination between authorities.

- SCC provided sandbags to slow down the ingress of water into properties, and recycled the sandbags after the event.
- SCC staff attended resident engagement events after the flooding to hear their concerns and gather additional information.
- After the storms and flooding, SCC cleared trees, debris and carried out ditching works to enable the drainage systems to function normally again.
- SCC operated a call centre throughout the flooding which dealt with residents queries and have since hired a Community Resilience Officer to support communities in becoming more resilient to flooding amongst other issues.
- SCC administered the Repair and Renew Grant which provided up to £5000 for residents and businesses that were flooded in order to protect their property from flooding in the future.

Surrey Heath Borough Council

SHBC have the following flood risk management functions: to designate structures and features that affect flood risk and they may also undertake works on Ordinary Watercourses to reduce flood risk, however this is a permissive power.

No specific flood risk management functions have been identified as being directly relevant to the 2013/2014 flooding incident in Surrey Heath.

All RMAs

All RMAs under the Flood and Water Management Act (2010) have a responsibility to cooperate and coordinate with regards to their flood risk management functions, including raising awareness of flood risk and the sharing of information. Landowners also have riparian responsibilities under the Flood and Water Management Act (2010) to maintain and undertake any necessary works on assets on their land (with consent from the relevant RMA) which may have an effect on flood risk including watercourses and drainage assets.

6. Format of Subsequent Sections

The sites in this report have been grouped into sub areas based on location.

There are 2 sub areas in this report, all within Surrey Heath Borough.

Each sub area will be introduced and information relevant to the whole sub area presented. Responsible RMA will be identified at sub group level, and their response to the flood event summarised.

Individual site information has predominantly come from SCC existing information (collated from a variety of sources) and the EA flood maps. No site visits were undertaken as there are over 500 sites to report on in Surrey; however Borough and District Councils were consulted to collect any further information in relation to the flood events at the relevant sites. If further information is required in relation to any of the sites, requests should be submitted to SCC via flooding.enquiries@surreycc.gov.uk.

7. Sub Area: Camberley

7.1. Sub Area Definition

This sub area covers the area of Camberley and specifically relates to flooding incident reports on Robins Bow, Middleton Road, the Maultway and a short section of London Road.

7.2. Location and Catchment Description

The Camberley sub area is located within the Blackwater catchment, which is a tributary of the River Loddon. The Maultway runs along the watershed between the Blackwater catchment and the adjacent Mill Bourne and Addlestone Bourne catchment. All of the channel and surface water drains in a south westerly direction towards the Blackwater River. There are no Main Rivers in the Camberley sub area, although the western boundary of the sub area is adjacent to the Blackwater River. To the south of Robins Bow is a drainage channel that runs parallel with the railway line and flows in a south westerly direction to meet the Blackwater River.

During the winter of 2013/14 there were a number of instances of internal property flooding in the Camberley sub area.

The western section of the sub area is underlain by sand, silt and clay (Windlesham Formation), while the remainder is underlain by Camberley Formation sand. The Maultway (B3015) and surrounding area is underlain by superficial River Terrace Deposits and Surrey Hill Gravel made up from a mixture of sand and gravel. The Camberley sub area has limited potential for groundwater flooding to occur at the surface.

EA online fluvial flood risk maps classifies a majority of the Camberley sub area as at very low risk of fluvial flooding (less than 1 in 1000 chance per year), with the exception of a small section on the western boundary, which is classified as having a low risk of fluvial flooding (between 1 in 100 and 1 in 1000 chance per year). This area of low flood risk from the Blackwater River is over 750m away from the closest recorded flood incident in Robins Bow.

The flood risk maps do not take into account climate change. They are designed only to give an indication of flood risk to an area of land and are not sufficiently detailed to show whether an individual property is at risk of flooding.

Middleton Road and parts of London Road in Camberley are clearly identified in the EA surface water flood maps as lying in a surface water flow route with a high risk of surface water flooding (less than 1 in 30 annual chance). Parts of Robins Bow are also identified as areas vulnerable to low surface water flood risk (between 1 in 100 and 1 in 1000 annual chance). These maps are based on topography and their accuracy is not as robust as the fluvial flood risk maps; however they can be used to identify general flow routes.

The sub area is not located within the EA Flood Warning or Flood Alert Areas.

7.3. Identification of Relevant RMAs

Following a range of consultation events during and since the floods, the relevant RMAs in this sub area have been identified as being the LLFA and the Highway Authority, both of which are SCC.

7.4. Exercised Flood Risk Management Functions and other Actions

<u>Actions by Surrey County Council</u>

Actions prior to and during the flood incident

No flood risk management functions relevant to SCC have been identified as specific to the flood incident in this sub area.

Section 5 provides details of SCC's wider flood risk management functions and other relevant actions prior to, during and since the flood incident.

Actions by Surrey Heath Borough Council

Actions prior to and during the flood incident

No flood risk management functions relevant to SHBC have been identified as specific to the flood incident in this sub area.

Section 5 provides details of SHBC's wider flood risk management functions and other relevant actions prior to, during and since the flood incident.

8. Sub Area: Lightwater

8.1. Sub Area Definition

This sub area covers the area of Lightwater and West End. It includes Grasmere Road, Blackstroud Lane East and West and Burnt Pollard Lane.

8.2. Location and Catchment Description

The Lightwater sub area is located within the Mill Bourne catchment, which is a main tributary of the River Wey. The Mill Bourne (otherwise known as the Hale Bourne and Windle Brook), is classified as a Main River and flows through the sub area from west to east. The Windlesham Ditch and the Lightwater Stream, which are also classified as Main River, drain areas to the north and south of the Lightwater sub area and joins the Mill Bourne in the middle of the sub area. The Mill Bourne flows under Burnt Pollard Lane.

During the winter of 2013/14 flooding resulted in a number of road closures in the Lightwater sub area.

The sub area is underlain by sand, silt and clay (Windlesham Formation), in addition to Camberley Formation sand. Burnt Pollard Lane is intersected by superficial deposits of peat and alluvium while sections of Blackstroud Lane East are underlain by head deposits comprised of clay, silt, sand and gravel. Only the east of the Lightwater sub area has the potential for groundwater flooding to occur at the surface.

The EA online fluvial flood risk maps classifies Burnt Pollard Lane as an area of high fluvial flood risk with less than a 1 in 30 annual chance of flooding. While within 100m of the Mill Bourne and joining Burnt Pollard Lane, Blackstroud Lane East and West is classified as having a very low risk of fluvial flooding (less than 1 in 1000 annual chance). Grasmere Road is also classified as having a very low risk of fluvial flooding (less than 1 in 1000 annual chance).

The EA's online Updated Flood Maps for Surface Water indicate that parts of the sub area are at risk from surface water flooding, with the main surface water flow routes following the Main Rivers, as well as the A322 and Broadway Road. These areas are classified as having a high risk of surface water flooding (less than 1 in 30 annual chance). There are also areas at risk of surface water flooding along Burnt Pollard Lane and Blackstroud Lane. The surface water maps are based on topography and their accuracy is not as robust as the fluvial flood maps; however they can be used to identify general flow routes

The flood risk maps do not take into account climate change. They are designed only to give an indication of flood risk to an area of land and are not sufficiently detailed to show whether an individual property is at risk of flooding.

The parts of the sub area closest to the main rivers are within the Flood Warning and Flood Alert Areas. These are areas for which the EA provides free flood warnings.

8.3. Identification of Relevant RMAs

Following a range of consultation events during and since the floods, the relevant RMAs in this sub area have been identified as being the LLFA (SCC), the Highway Authority (SCC), the EA and the Land Drainage Authority (SCC / SHBC).

8.4. Exercised Flood Risk Management Functions and other Actions

Actions by the Environment Agency

Prolonged and heavy rainfall over the autumn and winter of 2013-14 led to raised river levels across the County of Surrey including on the River Thames and its tributaries. The EA operated their Flood Warning and Alert Service throughout the flood incident. Table 8-1 shows the Flood Alerts issued by the EA in the Lightwater sub area during the winter 2013/14 flooding. No flood warnings were issued within the Lightwater sub area.

Table 8-1. Flood Alerts issued by the Environment Agency in the Lightwater sub area in winter 2013/14.

Flood Alert Area	Date	Time
Windle Brook and Hale, Mill and Addlestone Bournes	18/01/2014	08:14
Windle Brook and Hale, Mill and Addlestone Bournes	02/02/2014	08:10

Section 5 provides details of EA's wider flood risk management functions and other relevant actions prior to, during and since the flood incident.

Actions by Surrey Heath Borough Council

No flood risk management functions relevant to SHBC have been identified as specific to the flood incident in this sub area.

Section 5 provides details of SHBC's wider flood risk management functions and other relevant actions prior to, during and since the flood incident.

Actions by Surrey County Council

SCC carried out a number of temporary road closures during the flooding including Blackstroud Lane, Burnt Pollard Lane and Grasmere Road.

No flood risk management functions relevant to SCC have been identified as specific to the flood incident in this sub area.

Section 5 provides details of SCC's wider flood risk management functions and other relevant actions prior to, during and since the flood incident.

9. Conclusion

The objective of this report is to investigate which RMAs had relevant flood risk management functions during the flooding and whether the relevant RMAs have exercised, or propose to exercise, their risk management functions (as per section 19(1) of the Flood and Water Management Act 2010). It should be noted that this duty to investigate does not guarantee that flooding problems will be resolved and cannot force others into action.

The report has identified that the EA carried out actions in relation to the flooding experienced in Surrey Heath Borough over winter 2013/14. It has also been established that SCC did not have any direct flood risk management functions in responding to the flood event, but strategic functions and other supportive actions were taken, which have been outlined in the report.

It is noted that although there was some significant incidents of flooding from this event in Surrey Heath, many other Districts and Boroughs within Surrey were impacted to a greater extent.

9.1. Causes

There were approximately 6 incidents of property flooding in Surrey Heath. The main cause of the widespread flooding across Surrey was the exceptional and unprecedented amount of rainfall that fell over the months of December, January and February 2013/14, which in turn resulted in instances of flooding mainly from surface water flooding in the Camberley sub area and a combination of both surface water and fluvial flooding in the Lightwater sub area.

9.2. Flood Data

While systems are in place to record instances of flooding on a day-to-day basis, it was found that the data format and specific details of flooding records were inconsistent across different organisations. For example, approaches that generically recorded properties as “affected by flooding” did not make clear whether the property was flooded internally. This caused issues when collating the data into a central database, reducing the level of accuracy for some specific flooding records.

The information held by SCC on highway drainage assets and their condition is very limited in many areas, which can make it more difficult to identify the sources and cause of flooding in some instances. Information for smaller watercourses (privately owned or otherwise) is also very limited in some areas.

9.3. Role of Local Communities

In addition to the functions and actions carried out by RMAs, there are many ways in which residents and communities can reduce flood risk. Local flood forums existed in Surrey prior to the Winter 13/14 flood event but many more have been set up in the aftermath of this event. The role of RMAs in these local groups is instrumental in educating the public on flood risk and supporting them in implementing their own action plans and resilience measures. These groups also play a vital role in feeding back critical information on localised flooding issues to support the authorities in better understanding local flood risk and identifying potential solutions to mitigate this risk.

There are still widespread occurrences of riparian watercourses and ditches that are not maintained. Keeping all watercourses well maintained will not (in itself) prevent flooding from major flood events but the lack of maintenance of some riparian owned ditches was certainly a contributing factor on the impact of the flooding experienced from the winter 13/14 flood event.

9.4. Looking Forward

A vast amount of information on historic flooding was gathered as a result of the winter 13/14 flood event. This data will help highlight the areas most at risk of flooding in Surrey, enable the prioritisation of drainage maintenance works and support business cases when bidding for Government contributions towards major flood defence schemes.

9.5. Recommendations

Based on the findings of this Section 19 investigation, it is recommended that:

- All RMAs continue to improve their cooperation, coordination and communication with one another, particularly with regard to their flood risk management functions and during times of emergency.
- All RMAs continue to raise awareness of flood risk and increase the resilience of communities and businesses to flood risk, across Surrey.
- SCC and the EA further develop public awareness and understanding of riparian responsibilities, in order to improve the condition of watercourses across Surrey.
- All RMAs review their current processes for data collection during a flood event, giving consideration to the best practice guidance produced by SCC and the EA.
- All RMAs pass any records of future property flooding in Surrey to SCC for collation in a central database.
- SCC undertake studies where there is significant groundwater flooding to better understand the nature of the flooding and the levels of risk.
- All RMAs review the benefits of proposed flood schemes in the Six Year Programme of Flood and Coastal Erosion Risk Management Schemes and consider whether partnership contributions may be justified.
- SCC undertake detailed drainage surveys where asset information is limited or non-existent, prioritising areas at greatest risk of flooding.
- SCC formalise the process for investigating major flood events under the S19 duty and agree this process with the Surrey Flood Risk Partnership Board, to ensure efficient partnership working and data sharing for future investigations.

10. Acknowledgements

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- The Environment Agency,
- Surrey Heath Borough Council
- Atkins