Highgate & Kirkland, Kendal

Flood Investigation Report No 69

Flood Event 28th June 2012

This flood investigation report has been produced by Cumbria County Council as a Lead Local Flood Authority under Section 19 of the Flood and Water Management Act 2010.

Version	Undertaken by	Reviewed by	Approved by	Date
Preliminary	Helen Renyard	Anthony Lane		21st June 2013
Draft	Helen Renyard	Anthony Lane		23rd June 2013
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Executive Summary

Cumbria County Council as Lead Local Flood Authority has prepared this report with the assistance of other Flood Risk Management Authorities as it considers necessary to do so under Section 19 of the Flood and Water Management Act 2010.

On the 28th June 2012 an extreme rainfall event caused flooding in the Highgate and Kirkland area of Kendal.

Nine commercial properties and parts of the Highgate and Kirkland sections of the A6 were affected by the surface water flooding. The A6 became impassable to vehicles for a time.

The highway and public sewer drainage systems became overwhelmed with the surface water flow to the Highgate and Kirkland areas as it is likely their design criteria was exceeded by the rainfall event.

Cleaning and improvement works have been carried out by both United Utilities and CCC Highways following the event, but it is unlikely that existing drainage systems would be able to cope with a rainfall event of this intensity.

The report recommends that public/businesses continue to report any future flooding and that the Making Space for Water Group continue to seek solutions to reduce flood risk and assess if the criteria for funding mechanisms can be met.

Event Background

This section describes the location of the flood event and identifies the properties that were flooded.

Flooding Incident

Kendal is a market town in Cumbria that has been constructed on the banks of the River Kent. The area is surrounded by low hills. The town is an important centre for the rural community it serves as well as being an important tourist location for people visiting the Lake District and is often referred to as 'The Gateway to the Lakes'.

Highgate is a commercial area towards the southern end of Kendal town centre. It is located at the bottom of the Kendal Fell to the west with the River Kent a short distance to the east. A number of roads drop steeply to Highgate from the west, there are no watercourses as such but there are both highways drainage systems and UU sewer systems present. As an urbanised part of Kendal much of the surrounding area consists of buildings and roads with very few permeable areas where rainwater can be allowed to soak into the ground naturally. Urbanised areas can respond rapidly to intense rainfall causing a build-up of surface water if drainage systems are unable to deal with the flows.

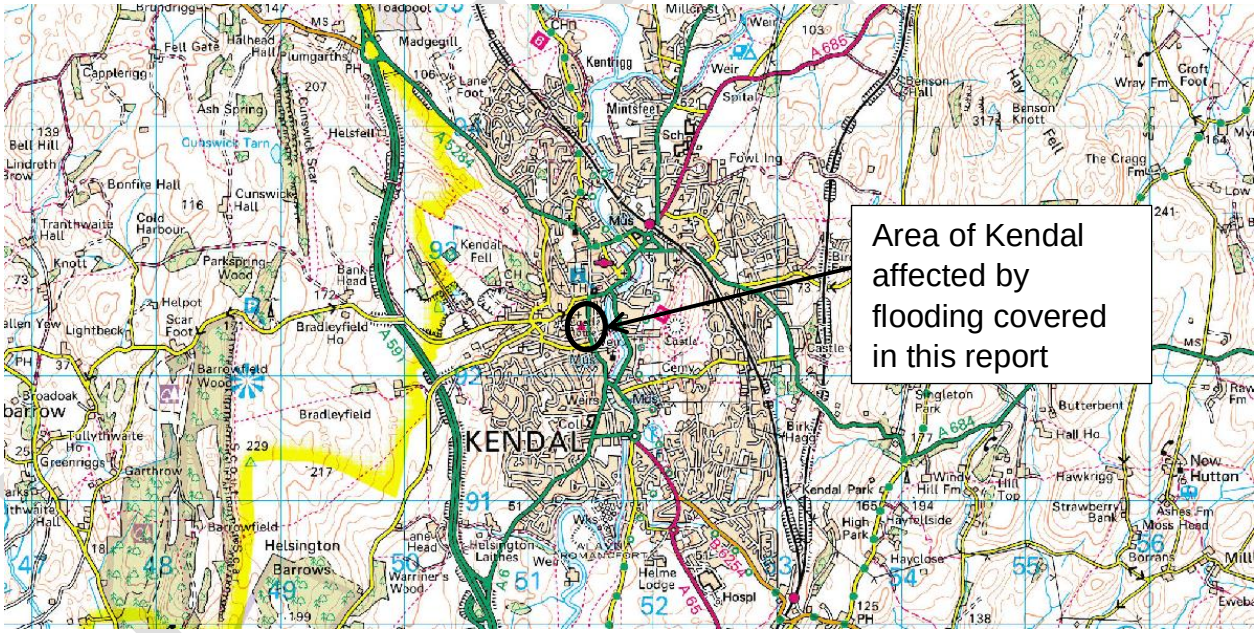

Figure 1 Plan identifying affected area of Kendal

On 28th June 2012 a heavy rainfall event occurred over Kendal severely affecting the Highgate area. Surface water flowed on to the A6 / Highgate making it impassable for vehicles and causing internal flooding into some of the commercial properties along the street. It is believed that 9 properties were flooded (or close to being flooded) during this event. The following figure highlights the areas most significantly affected by the flooding.

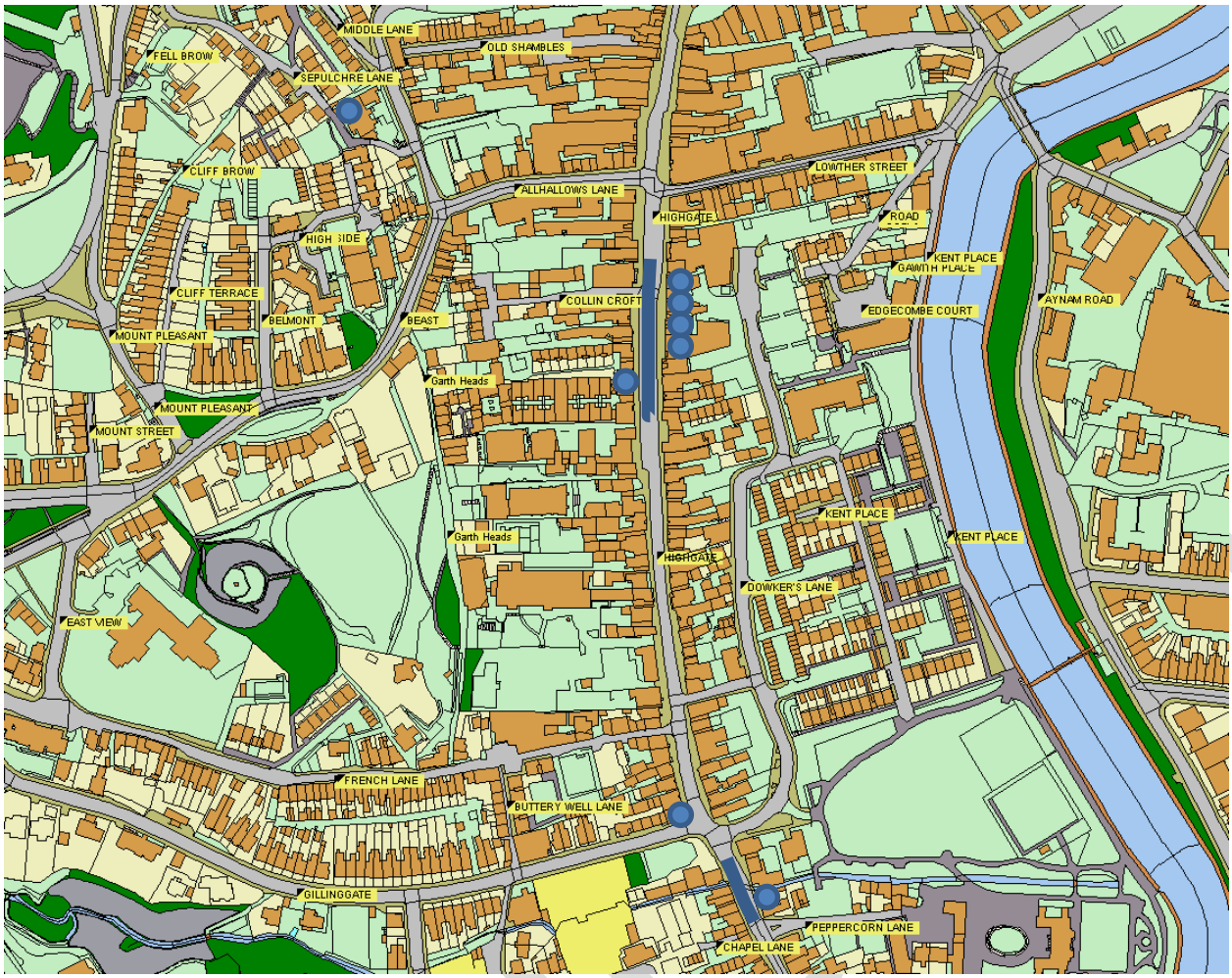

Figure 2 Indicating locations of flooded properties and affected highway

The affected properties are indicated by the blue dots and the affected lengths of highway are indicated by the blue line.

Investigation

Rainfall Event

A number of Heavy Rainfall Alerts were issued by the Met Office over the days preceding the flooding on the afternoon of the 28th June. These were issued with medium confidence and suggested that some locally high rainfall totals could be observed over Cumbria, although there was uncertainty as to exactly where this rain would fall. High intensity rainfall was forecast as an active frontal system moved in quickly from the south west and traversed Cumbria leaving the north east corner late in the afternoon. High rainfall totals were expected at those locations within a very short period.

The Environment Agency operates a network of rain gauges across Cumbria. The rain gauge station with the highest rainfall total for the 28th June was at Levens Bridge End, about 10km south east of Kendal. This rain gauge recorded a total of 39 mm in a 24 hour period. Within this total was one fifteen minute spell where 20 mm fell. This is very intense rainfall and although it was reflected in the forecast by the Met office it is believed to be the highest 15 minute total recorded by the Environment Agency in recent times.

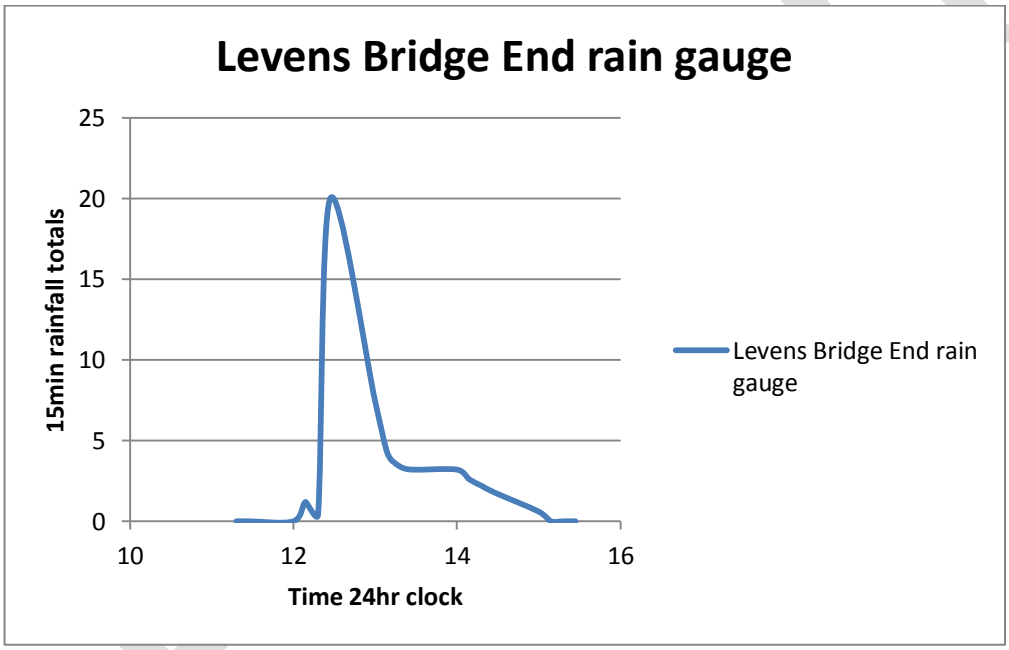

Figure 3 15min rainfall totals (mm)

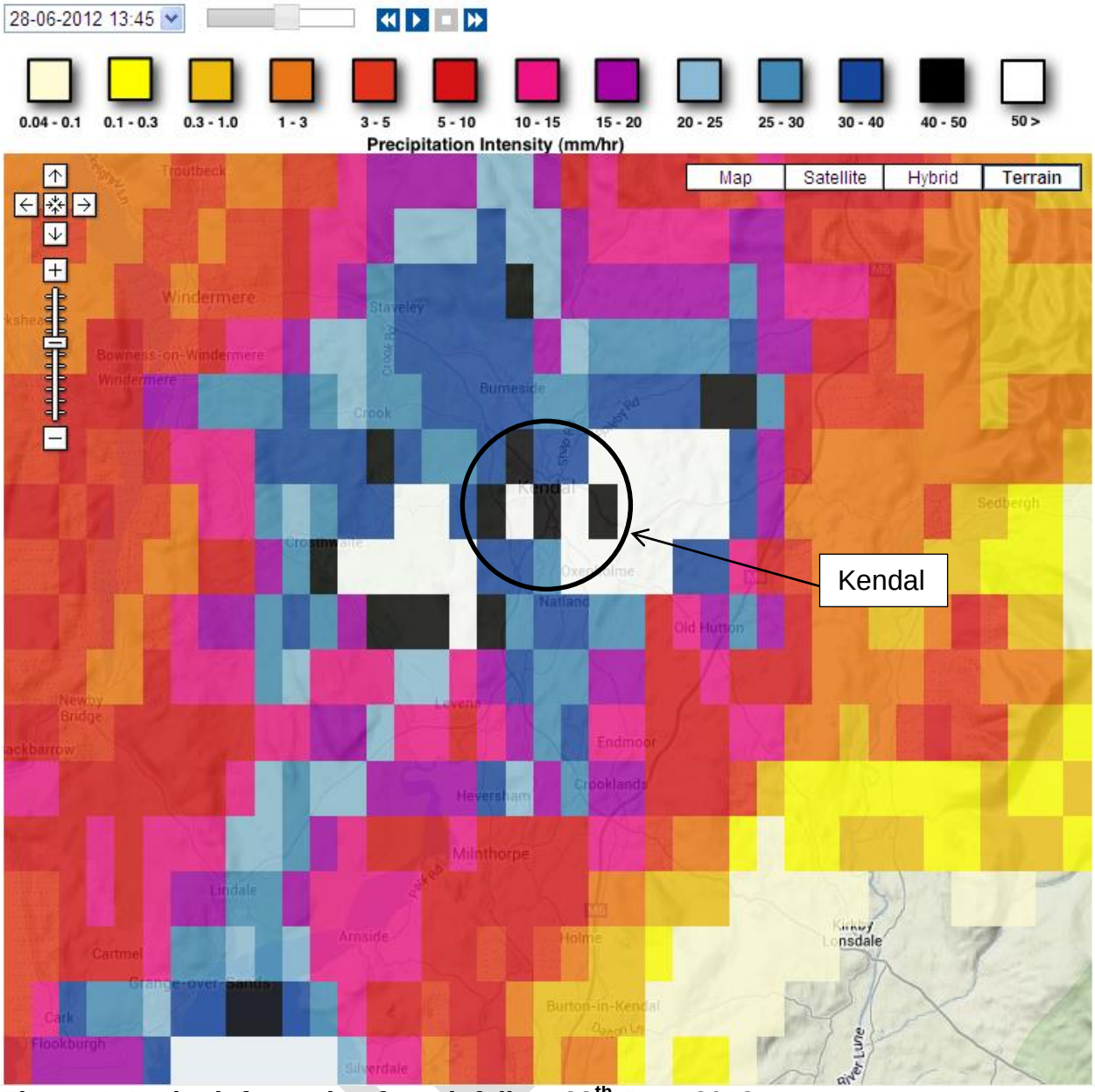

Figure 4: Radar information for rainfall on 28th June 2012

Map of Flow Routes

Surface water flooding as a result of rainwater falling on surrounding land quickly became sheet flow and found its way on to highways and tracks. Once on these, flood water quickly funnelled downhill towards Kendal town centre (Beast Banks & Allhallows Lane). Flow routes through small alleyways running off Highgate did form and these channelled water to an area of car parking to the rear of Iceland where water did collect to a significant depth.

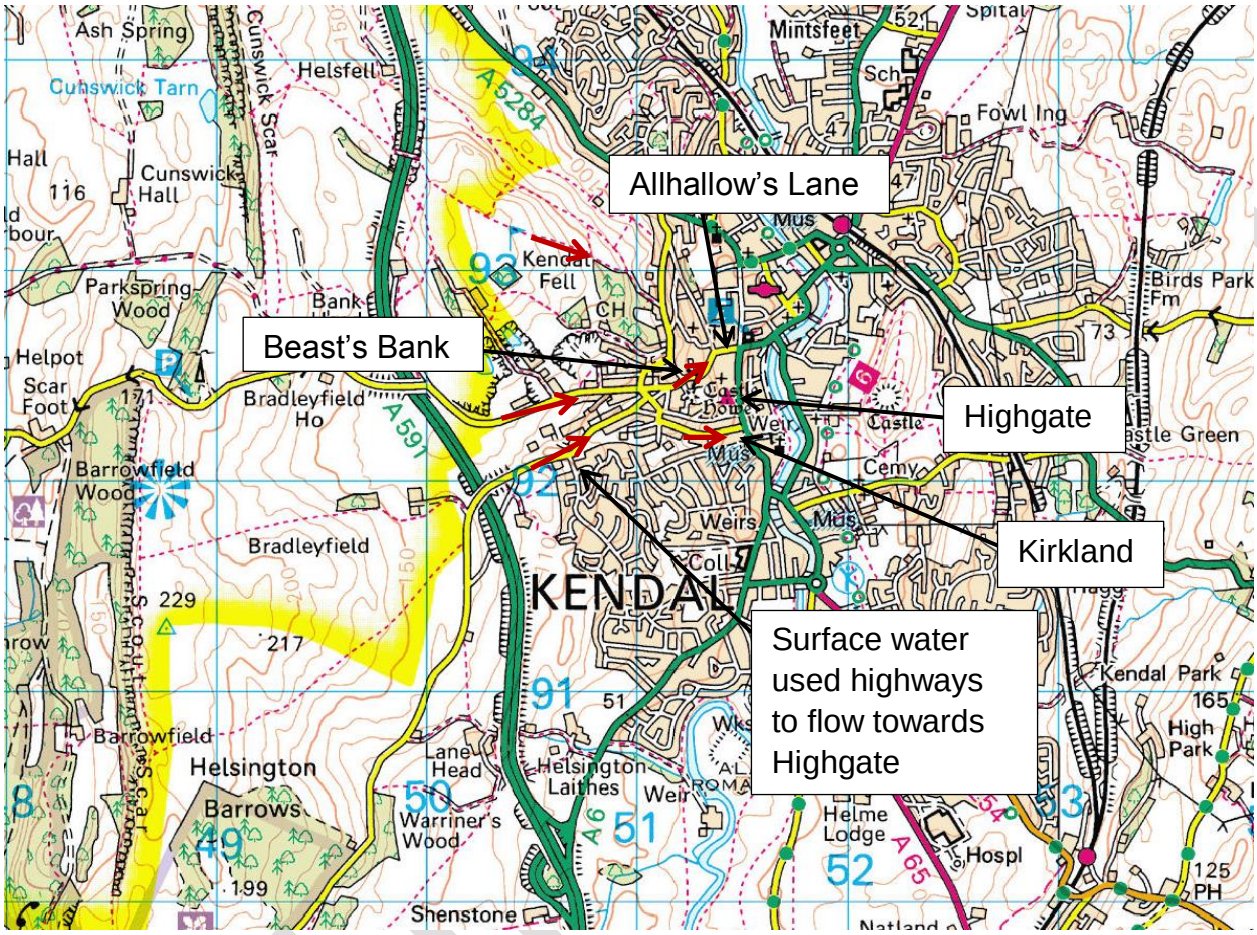

Figure 5 Plan indicating topography of the surrounding area

The figure on the following page details the flow routes closer to the Highgate and Kirkland areas. In many cases the roof drainage from the surrounding buildings drains directly to the footway or carriageway along Highgate and Kirkland which adds to the surface water that collects on the carriageway.

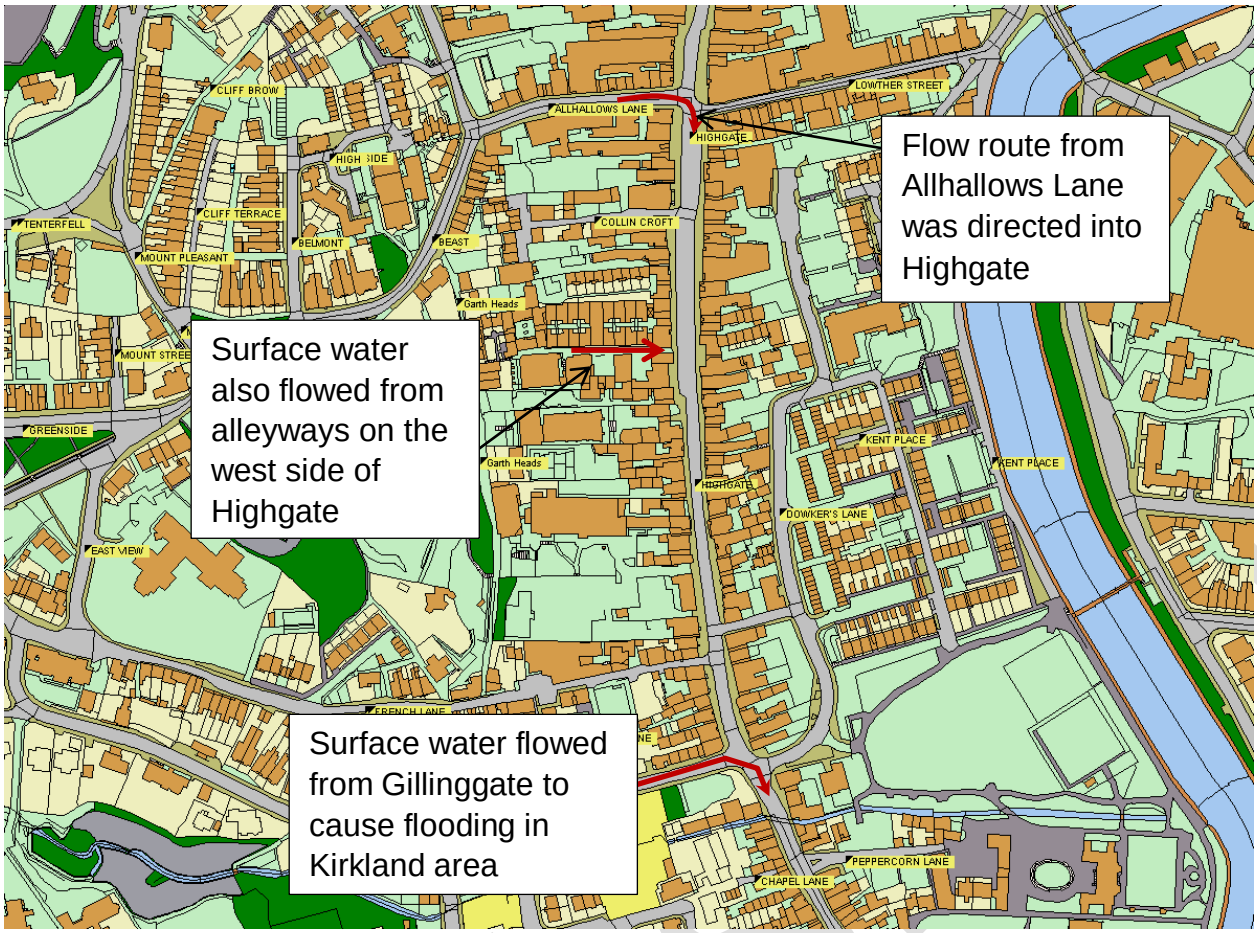

Figure 6 Flow routes onto the Highgate and Kirkland area

Likely Causes of Flooding

The most significant factor in the flooding in Highgate and Kirkland was the rainfall event that occurred on the 28th June 2012. The rainfall event was a short very intense event which created significant volumes of surface water run-off.

The surface water travelled with great velocity towards the Highgate and Kirkland area as in many cases the gullies were ineffective due to the extremity of the event. Once the surface water reached Highgate and Kirkland the drainage systems within the area became quickly overwhelmed. The highway gullies within Highgate area discharge to the public sewer maintained by United Utilities. Some blocked gullies within the Highgate area reduced the ability of the surface water to dissipate from the area. It is evident that the rainfall event was much in excess of the capacity within the drainage systems.

Flooding History

Highgate has flooded historically. The mechanism is believed to be similar to that which occurred on the 28th June 2012.

There have also been further instances of surface water collecting in Highgate since June 2012 although these have not resulted in property flooding.

Recommended Actions

Action by	Recommended Action	How
CCC Highways	Investigate condition of existing drainage/gullies	Carry out investigations during the planned footway repair / resurfacing works. **COMPLETED September 2012**
CCC Highways	Upgrade gully grates and install additional gullies where possible.	Carry out works as part of the planned footway repair / resurfacing works. **COMPLETED September 2012 (2no new gullies provided and improvements made to 8no gullies)**
CCC Highways	Consider re-profiling cross roads between Allhallows Lane, Highgate and Lowther Street in order to facilitate cross flow from Allhallows to Lowther Street and onwards to the River Kent.	This would be a long term objective and only viable when reconstruction of that section of the carriageway was required. Possible FCRM GiA funding.
CCC Highways	Investigate the possibility of increasing the height of kerb line particularly in the Kirkland area	Take levels to check if this is possible and investigate sources of funding if feasible.
United Utilities	Cleaning works and CCTV survey of public surface water sewer from Highgate through Iceland site	Use jetter and camera equipment to clean and survey public sewer. **COMPLETED**
Businesses / Residents	Continue to report flooding issues to the relevant authorities	Use contact details in Appendix 4 to report any future flooding
Making Space for Water Group	Continue to assess flood risk to the area and where appropriate investigate further options to reduce flood risk.	Investigate flood frequency within the area to see if FCRM GiA funding is possible
Environment Agency	Consider request heavy rainfall alerts direct to businesses	Investigate possibility of issuing weather warnings to businesses
CCC LFRM	Investigate reports of springs forming near Highgate during heavy rainfall	During heavy rainfall visit the area to identify where the springs appear

Residents and property owners who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected. Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include laying sandbags and moving valuable items to higher ground, to more permanent measures such as installing floodgates, raising electrical sockets and fitting non-return valves on pipes. Anyone affected by flooding should try to document as much information about the incident as possible.

Next Steps

CCC as the LLFA will continue to ensure that any actions identified within the actions table of this report are appropriately taken forward by each Risk Management Authority identified. Actions will continue to be prioritised through the Making Space for Water process and monitored through regular meetings of the group. Details of the MSfWG members and summary of related processes are detailed in Appendix 2.

Appendices

Appendix 1: Glossary

Acronyms

EA	Environment Agency
CCC	Cumbria County Council
UU	United Utilities
LLFA	Lead Local Flood Authority
LFRM	Local Flood Risk Management
MSfWG	Making Space for Water Group
FAG	Flood Action Group

Appendix 2: Summary of Relevant Legislation and Flood Risk Management Authorities

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010 (the Act) have established Cumbria County Council (CCC) as the Lead Local Flood Authority (LLFA) for Cumbria. This has placed various responsibilities on CCC including Section 19 of the Act which states:

Section 19

(1) On becoming aware of a flood in its area, 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.

A '*Risk Management Authority' (RMA)* means:

(a) the Environment Agency,

(b) a lead local flood authority,

(c) a district council for an area for which there is no unitary authority,

(d) an internal drainage board,

(e) a water company, and

(f) a highway authority.

The table below summarises the relevant Risk Management Authority and details the various local source of flooding that they will take a lead on.

Flood Source	Environment Agency	Lead Local Flood Authority	District Council	Water Company	Highway Authority
RIVERS					
Main river					
Ordinary watercourse					
SURFACE RUNOFF					
Surface water					
Surface water on the highway					
OTHER					
Sewer flooding					
The sea					
Groundwater					
Reservoirs					

The following information provides a summary of each Risk Management Authority's roles and responsibilities in relation to flood reporting and investigation.

Government – Defra develop national policies to form the basis of the Environment Agency's and Cumbria County Council's work relating to flood risk.

Environment Agency has a strategic overview of all sources of flooding and coastal erosion as defined in the Act. As part of its role concerning flood investigations this requires providing evidence and advice to support other risk management authorities. The EA also collates and reviews assessments, maps and plans for local flood risk management (normally undertaken by LLFA).

Lead Local Flood Authorities (LLFAs) – Cumbria County Council is the LLFA for Cumbria. Part of their role requires them to investigate significant local flooding incidents and publish the results of such investigations. LLFAs have a duty to determine which risk management authority has relevant powers to investigate flood incidents to help understand how they happened, and whether those authorities have or intend to exercise their powers. LLFAs work in partnership with communities and flood risk management authorities to maximise knowledge of flood risk to all involved. This function is carried out at CCC by the Local Flood Risk Management Team.

District and Borough Councils – These organisations perform a significant amount of work relating to flood risk management including providing advice to communities and gathering information on flooding.

Water and Sewerage Companies manage the risk of flooding to water supply and sewerage facilities and the risk to others from the failure of their infrastructure. They make sure their systems have the appropriate level of resilience to flooding and where frequent and severe flooding occurs they are required to address this through their capital investment plans. It should also be noted that following the Transfer of Private Sewers Regulations 2011 water and sewerage companies are responsible for a larger number of sewers than prior to the regulation.

Highway Authorities have the lead responsibility for providing and managing highway drainage and certain roadside ditches that they have created under the Highways Act 1980. The owners of land adjoining a highway also have a common-law duty to maintain ditches to prevent them causing a nuisance to road users.

Flood risk in Cumbria is managed through the Making Space for Water process which involves the cooperation and regular meeting of the Environment Agency, United Utilities, District/Borough Councils and CCC's Highway and LFRM Teams to develop processes and schemes to minimise flood risk. The MSfWGs meet approximately 4 times per year to cooperate and work together to improve the flood risk in the vulnerable areas identified in this report by completing the recommended actions. CCC as LLFA has a responsibility to oversee the delivery of these actions.

Where minor works or quick win schemes can be identified, these will be prioritised and subject to available funding and resources will be carried out as soon as possible. Any major works requiring capital investment will be considered through the Environment Agency's Medium Term Plan or a partners own capital investment process.

Flood Action Groups are usually formed by local residents who wish to work together to resolve flooding in their area. The FAGs are often supported by either CCC or the EA and provide a useful mechanism for residents to forward information to the MSfWG.

Appendix 3: Technical Information

The extract of the Flood Map for Surface Water produced by the Environment Agency also identifies Highgate and Kirkland as being vulnerable to surface water flooding.

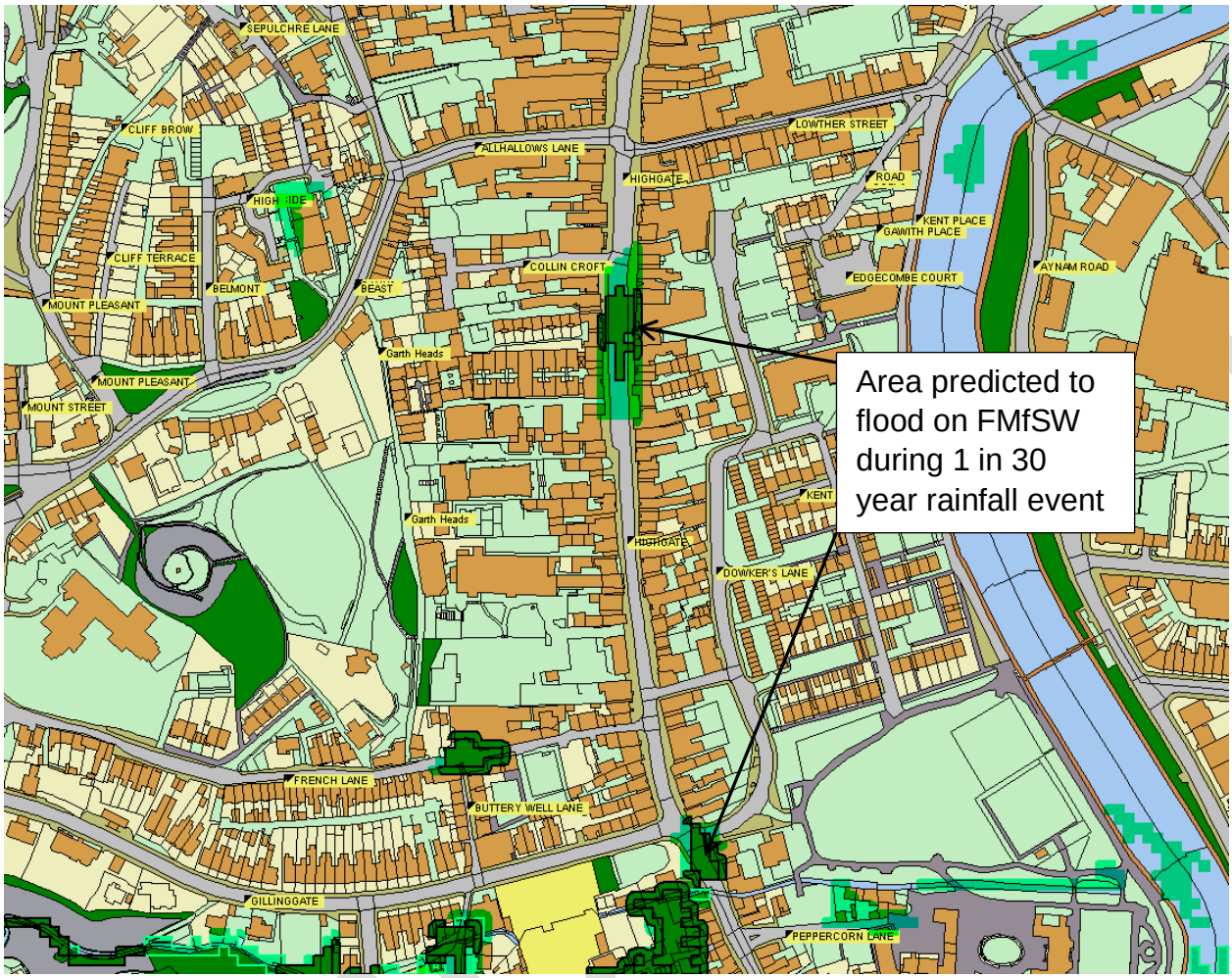

Figure 6 Extract from Flood Map for Surface Water (FMfSW)

Appendix 4: Useful contacts and links

Cumbria County Council (Local Flood Risk Management):
lfrm@cumbria.gov.uk, www.cumbria.gov.uk, tel: 01228 221330

Cumbria County Council (Highways):
highways@cumbria.gov.uk, www.cumbria.gov.uk, tel: 0845 609 6609
Out of hours emergencies should be reported via the Police on 101

Cumbria County Council (Neighbourhood Forum)
Carol.Last@cumbria.gov.uk, www.cumbria.gov.uk, tel: 01539 713180

United Utilities:
www.unitedutilities.co.uk, tel: 0845 746 2200

South Lakeland District Council:
info@southlakeland.gov.uk, www.southlakeland.gov.uk, tel: 0845 050 4434

Environment Agency:
www.environment-agency.gov.uk, General Enquiries: 03708 506 506,
Floodline: 0845 988 1188,

Flood and Water Management Act 2010:
http://www.legislation.gov.uk/ukpga/2010/29/contents

Water Resources Act 1991:
http://www.legislation.gov.uk/all?title=water%20resources%20act

Land Drainage Act:
http://www.legislation.gov.uk/all?title=land%20drainage%20act

Highways Act 1980:
http://www.legislation.gov.uk/all?title=highways%20act

EA – 'Living on the Edge' a guide to the rights and responsibilities of riverside occupation:
http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx

EA – 'Prepare your property for flooding' how to reduce flood damage including flood protection products and services:
http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx

Appendix 5: Summary of feedback to draft report

The following information has been received either at the Flood Forum held in Highgate on 25th June 2013, or forwarded after from various members of the community including residents, the County Councillor and members of the MSFW group.

- There appeared to be springs along the back of the properties along Highgate
- Some of the kerbs/footpaths are level with property thresholds particularly in the Kirkland area
- Request to be informed when severe rainfall is predicted
- Request to improve coordination between emergency services during an event particularly in relation to closing the road promptly

Translation services

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