

# Croglin

## Flood Investigation Report No 66



**Flood Event 28<sup>th</sup> June 2012  
And  
23<sup>rd</sup> July 2013**

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/ David White	Anthony Lane		23 <sup>rd</sup> Sept 2013
Draft	Helen Renyard	Anthony Lane		25 <sup>th</sup> Sept 2013
Published	Helen Renyard	Anthony Lane	Doug Coyle	9 <sup>th</sup> April 2014

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# Executive Summary

Cumbria County Council (CCC) 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.

Croglin has been affected by 2 significant rainfall events on 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013. The event on 28<sup>th</sup> June 2012 caused internal flooding to 4no properties. The cause of the flooding was due to excessive rainfall events that caused surface water to flow from the fell side into the village of Croglin. Surface water flowed down the road from the road end at Town Head Farm, through the village towards the main B road. It caused flooding on the carriageway and internal flooding to 2 no properties. Another 2 properties were flooded from Croglin Beck.

The report recommends various actions including on-going maintenance of drainage systems including gullies, development of a community plan and development of possible options to reduce the risk of flooding if funding can be obtained.



# Event Background

## Flooding Incident

Croglin is a small village of approximately 35 properties that lies in the foothills of the Pennines. The majority of the buildings are located along one road running through the village. Croglin is located approximately 19km northeast of Penrith.

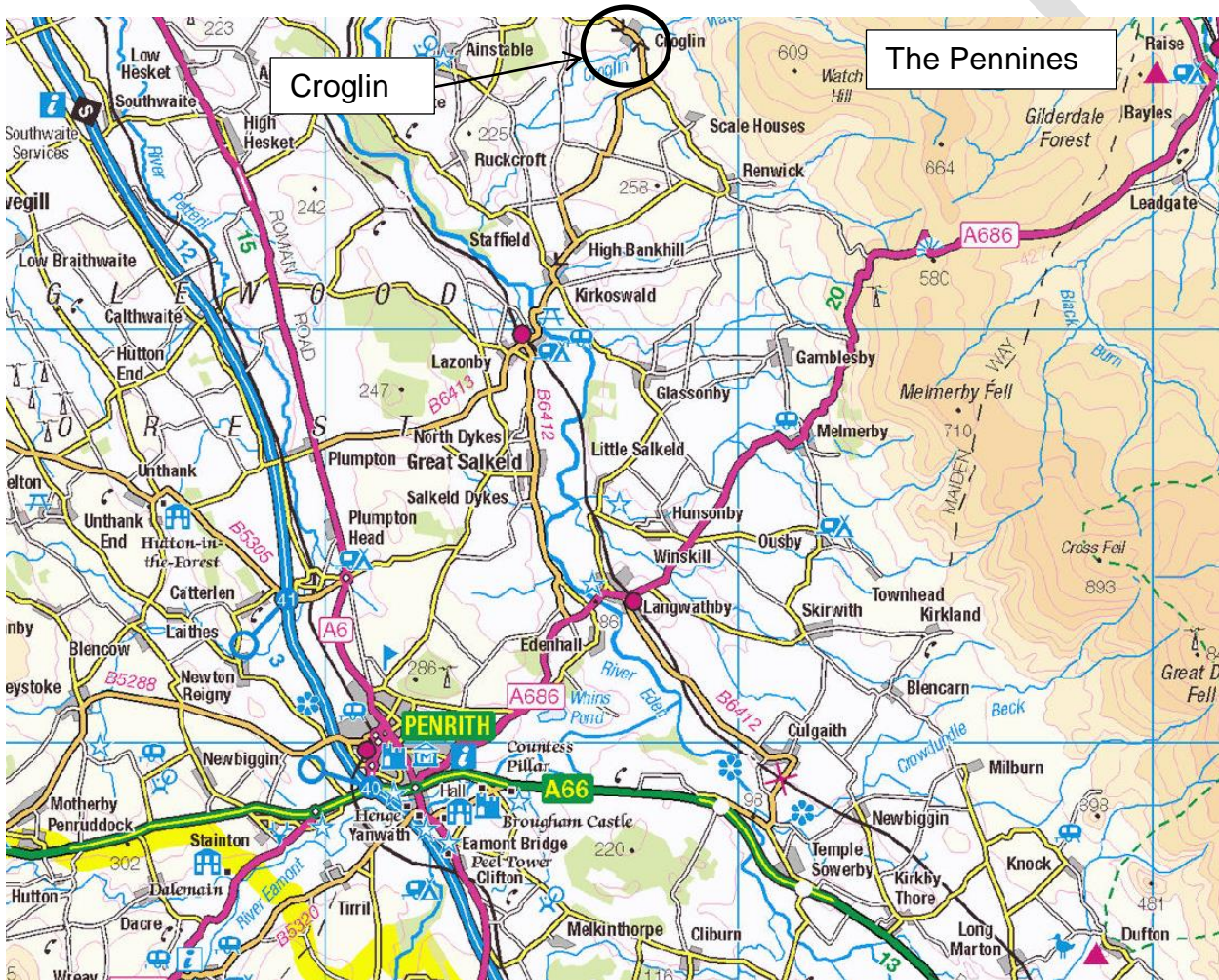


Figure 1: Location Plan.

Croglin was affected by 2no heavy rainfall events on 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013. The two events caused internal flooding at a total of 4no properties which were either flooded at one or both of the events. The flooded properties are indicated on the plan in figure 4.

# Investigation

The investigation carried out by CCC includes a collection of data from various sources including MSFW partners (Environment Agency (EA), United Utilities (UU), Eden District Council (EDC) and County Highways) and residents who have experienced the flooding.

## Rainfall Event

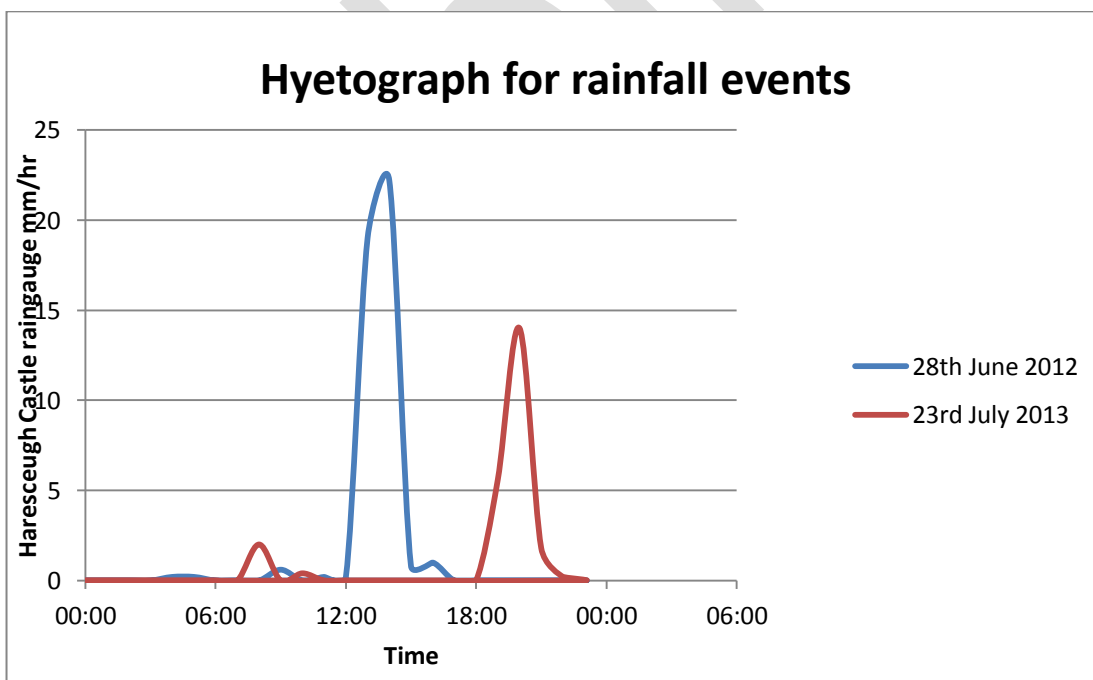
Rainfall data can be obtained from EA rain gauges that are located throughout Cumbria. However, during rainfall events these may not be located at the exact location of the event. The nearest rain gauge to Croglin is located at Haresceugh Castle which is approximately 5km from Croglin.

On 28<sup>th</sup> June 2012 a total of 44.2mm of rainfall was recorded at Haresceugh Castle with 42.2mm of the rainfall occurring between 12.00 and 14.15hrs.

During the 23<sup>rd</sup> July 2013 event a total of 21.4mm rainfall occurred within 3 hours.

The rainfall total recorded at Haresceugh Castle for June 2012 was 237% of the long term average. The long term averages used are provided by the Met office and are calculated using their 1961-1990 datasets.

The following hyetographs show the pattern of rainfall on 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013.



**Figure 2: Rainfall hyetograph for 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013.**

*Contains Environment Agency information © Environment Agency and database right*

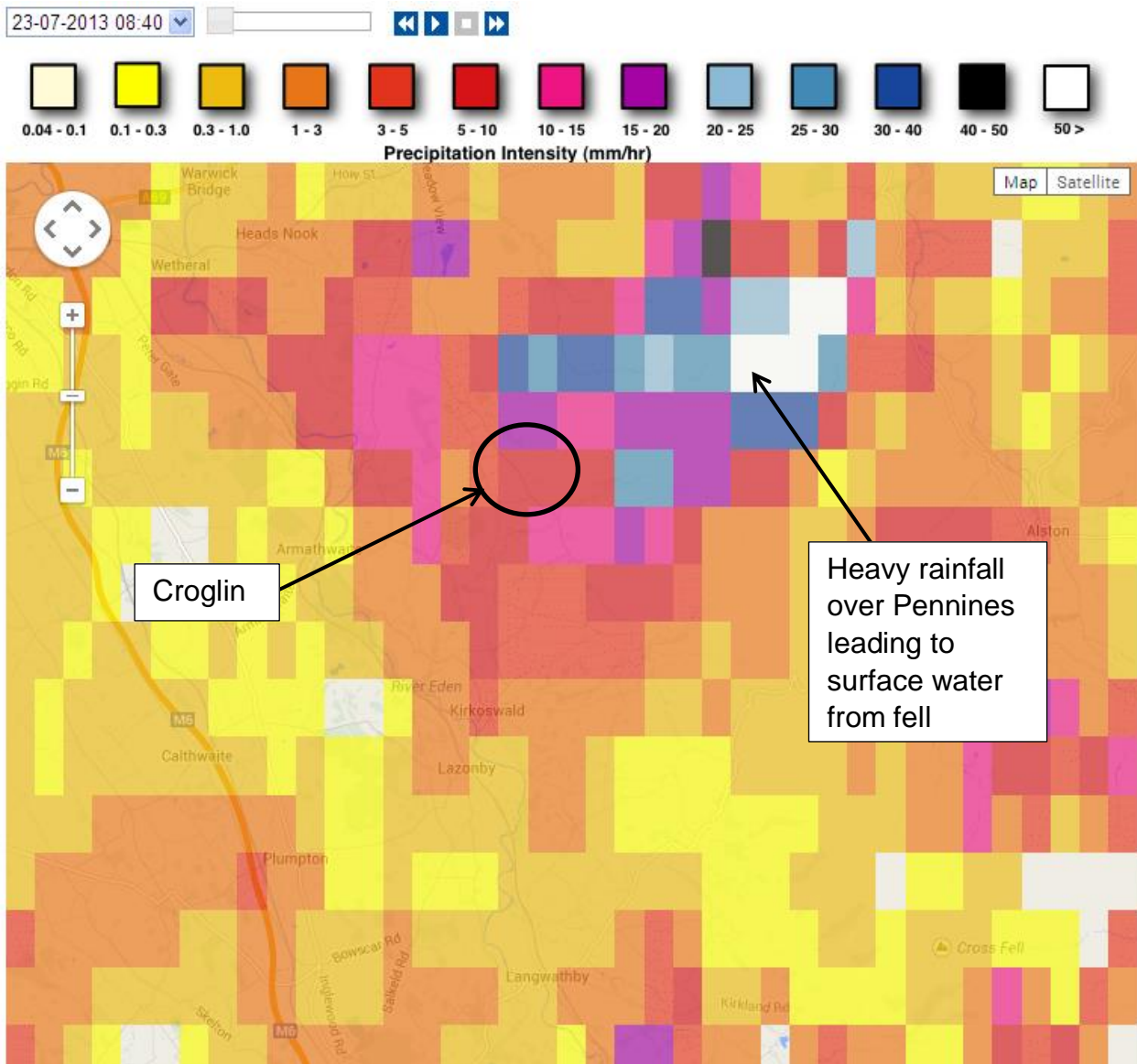
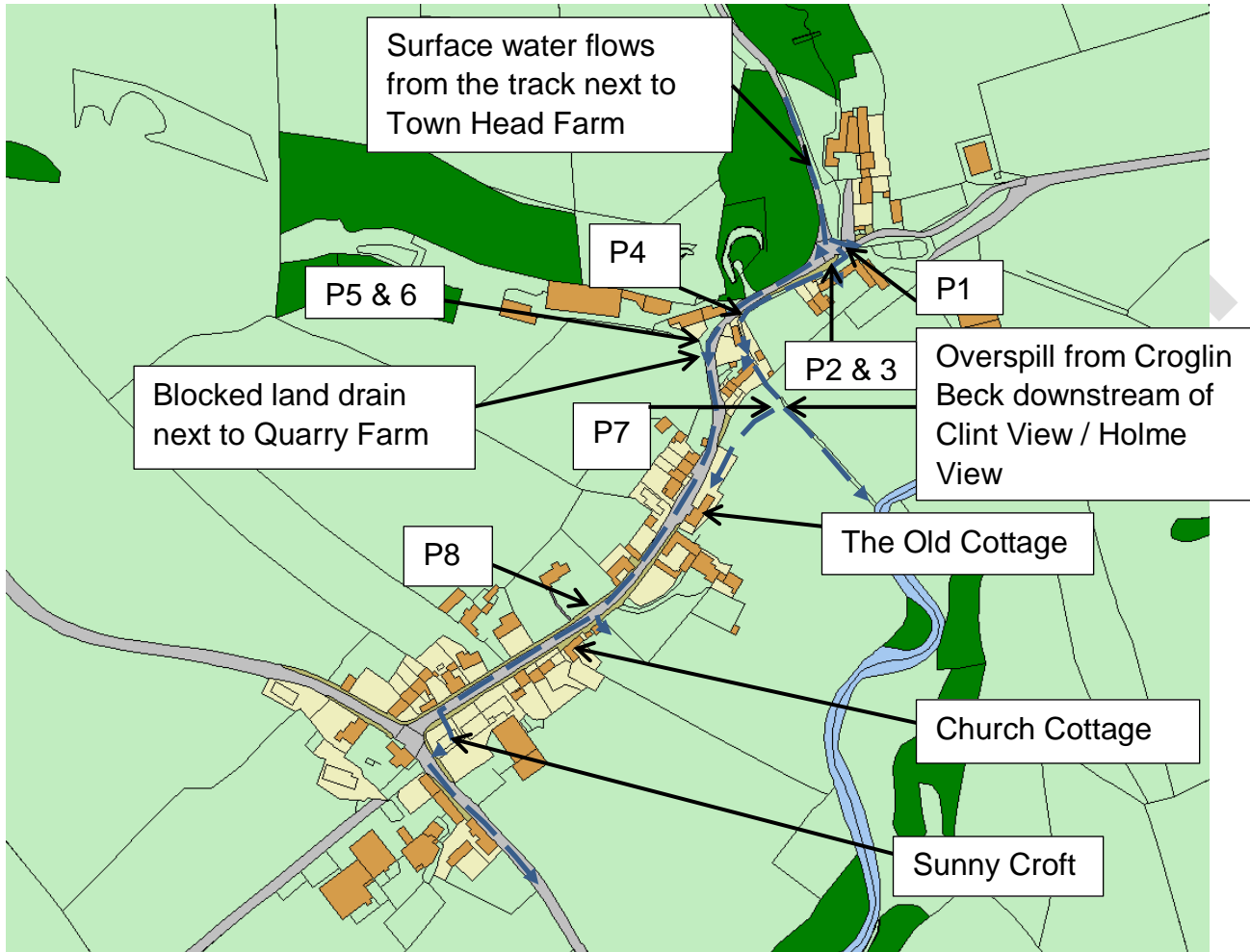


Figure 3: Radar information for 23<sup>rd</sup> July 2013 indicating peak intensities of 40mm+



## Map of Flow Routes

The main sources of flooding on 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013 were from overland surface water from the fell, using the track down into the village, excess water escaping from Croglin Beck and blockages to drainage near to Quarry farm.

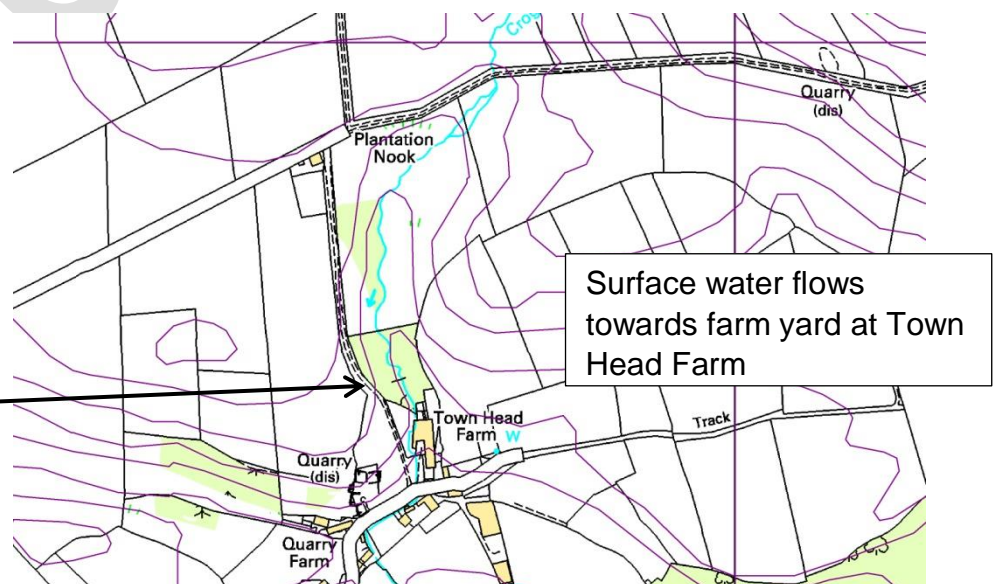


**Figure 4: Plan indicating flow routes through Croglin and location of photographs**

During flood events surface water uses the track next to Town Head Farm to flow towards the village.

**Figure 5: Area investigated to establish if surface water flows can be reduced**

Surface water flows in this direction towards Croglin village





The surface water flows down the track from the fells. However, observations made on a site visit during wet weather highlighted 2 cross ditches partially directing surface water flow in to Croglin Beck.



**Photographs 1 & 2: Surface water running towards Croglin Beck after the higher cross ditch**

The upstream cross ditch and the track profile are deflecting water towards Croglin Beck on the higher part of the track.



**Photograph 3: Higher cross ditch deflects surface water to side of track**





**Photograph 4: Lower cross ditch**

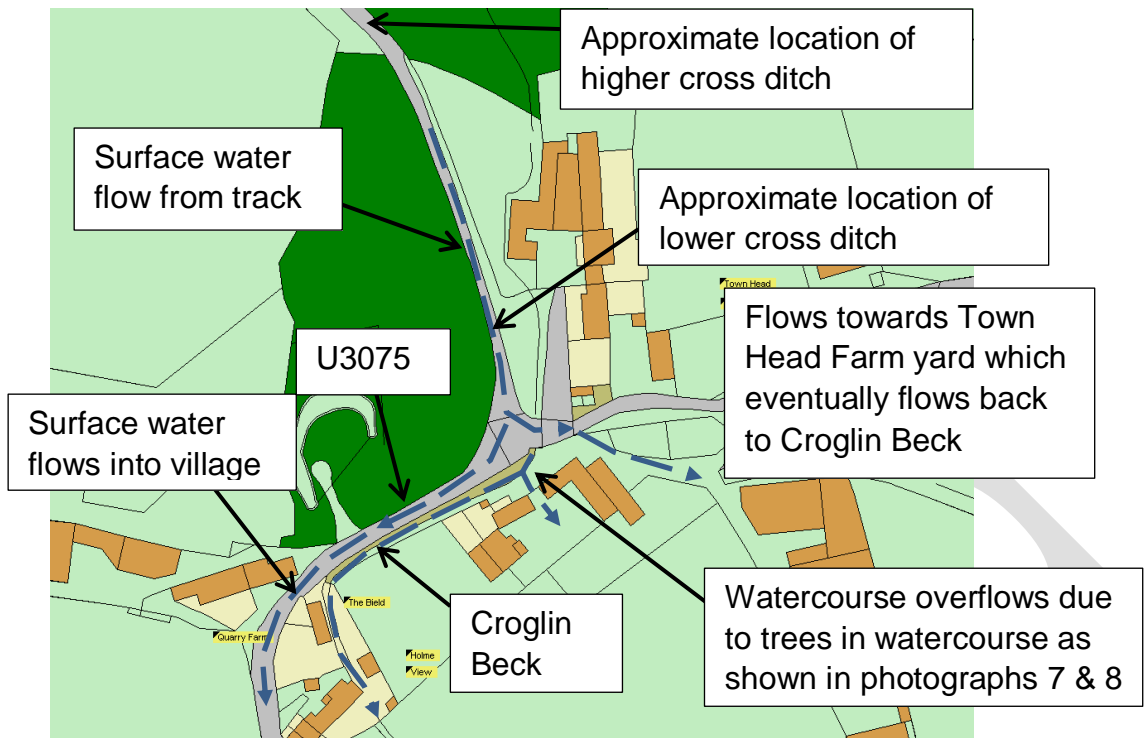


**Photograph 5: Track leading up fell side near Town Head Farm**

At Town Head farm the track meets the tarmac surfaced road. Here some of the surface water flow runs through one of the yards at Town Head Farm with the remainder running on down into the village and ultimately the B road.



**Photograph 6: Gully between Quarry Farm and Town Head Farm**



**Figure 6: Flow Routes from Fell track near Town Head Farm**



**Photograph 7 & 8: Tree in Croglin Beck near the bridge at Town Head Farm**

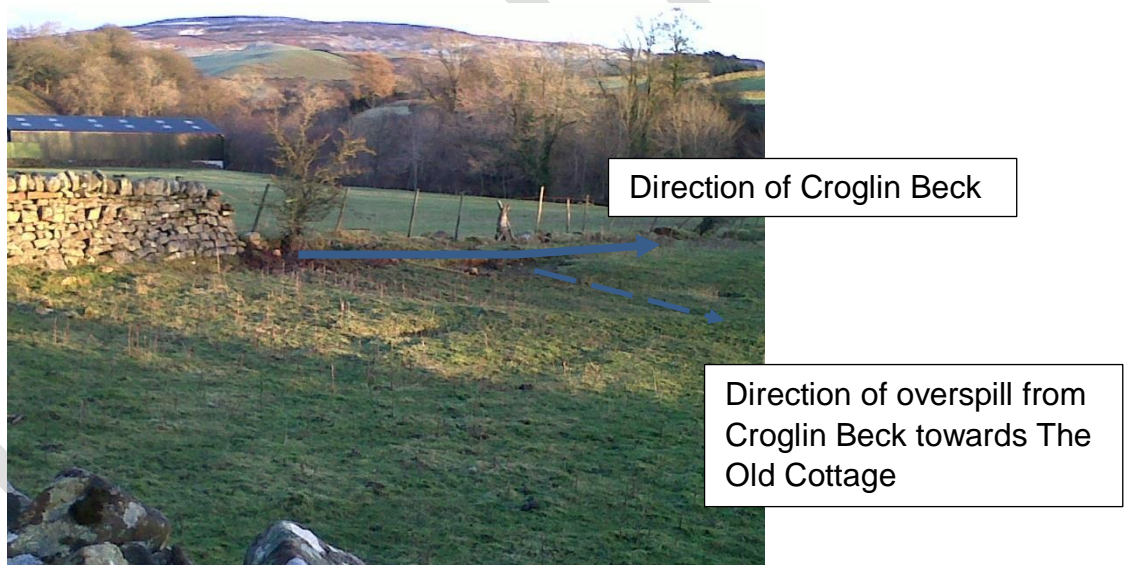
Photographs 7 & 8 show the trees in Croglin Beck, which caused water to flow from the watercourse and run between buildings at Town Head Farm. After flowing between the buildings the flood water flowed back towards Croglin Beck. Residents have commented that the trees used to be cleared on an annual basis and burned on the village bonfire





**Photograph 9 & 10: Evidence of blocked drainage pipe near Quarry Farm**

The blocked drain outside Quarry Farm has also been identified as a drainage issue as it creates a situation where water is at present constantly running on to the road as shown in photographs 9 & 10. During heavy rainfall events these flows are increased and create a significant flow of water towards the village.



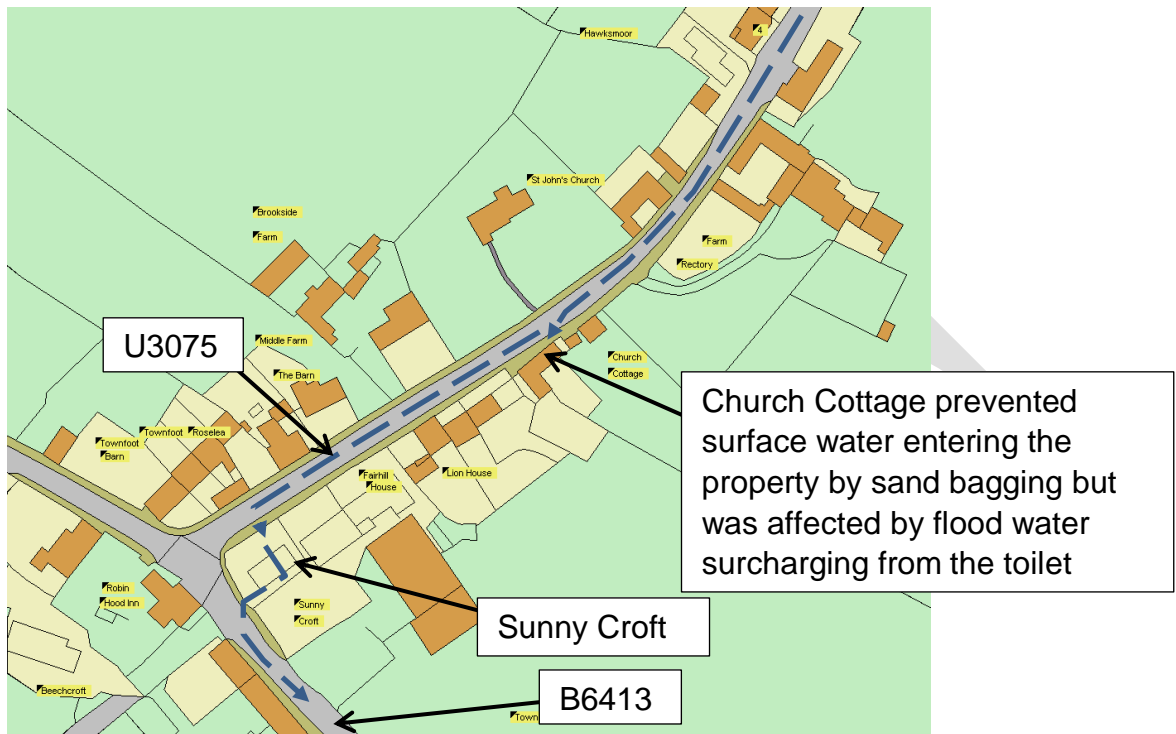
**Photograph 11: Croglin Beck downstream of Holme View / Clint View**

During the 28<sup>th</sup> June 2012 event flood waters escaped from Croglin Beck at the location shown in photograph 11 and flowed towards The Old Cottage where it entered the cottage causing internal damage. The flow route is also indicated in figure 3. Works have now been carried out by residents to prevent flows escaping from Croglin Beck at this section.

At Church Cottage flood water entered the property by surcharging through the toilet but surface water was prevented from entering the building directly by sand bagging carried out by the owner. The observation that flood water entered the building via the toilet would suggest that the public sewer had become surcharged. The most likely cause of the public sewer surcharging would be the additional surface water entering the system from the fell on top of surface water from property roofs which discharge to the combined public sewer. The owner of



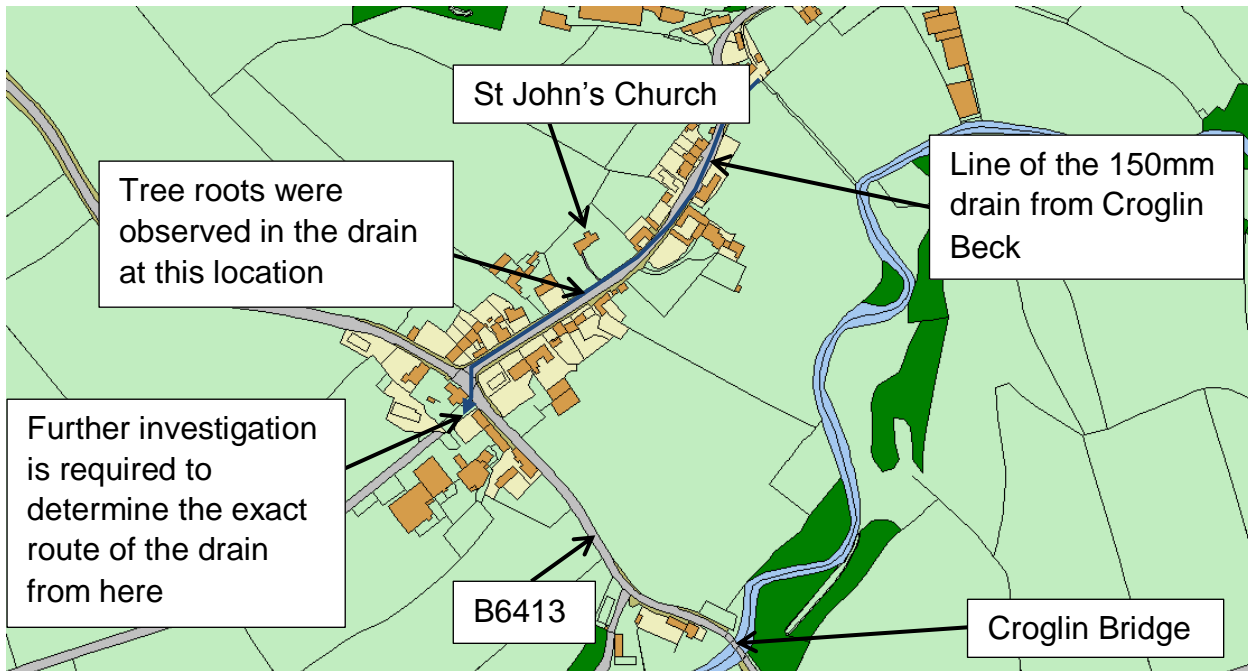
Church Cottage should report any incidence of flooding through the toilet direct to United Utilities and CCC on the contact numbers in Appendix 3.



**Figure 7: Location of Church Cottage and Sunny Croft including flow route of surface water**

Sunny Croft was affected by surface water flooding from the main road. Flood water flowed through the property and exited onto the B road before flowing towards Croglin Water.

Following the flood event on 23<sup>rd</sup> July 2013 County Highways have carried out investigation and cleaning works on drainage systems in the area to establish if the drainage systems are working to their full capacity. The line of the drain is shown in figure 8. Tree roots were identified in the section of surface water drain close to St John's Church. Investigations are continuing to ensure the drain is running at full capacity. The drain through the village is a 150mm diameter drain which is used to convey water from Croglin Beck through the village. This would originally have been constructed to provide stock with a water supply but is also used by highways to discharge surface water from the road.



**Figure 8: Line of the 150mm drain from Croglin Beck**

Once the surface water has flowed through the village it then makes its way down the B6413 road towards Croglin Water. The surface water flowing down the B6413 then flows down towards the properties close to Croglin Bridge and causes ponding in their driveways and flooding to a garage during heavy rainfall events. The properties are not known to flood internally. The B6413 and Croglin Bridge are identified in figure 8.

## Likely Causes of Flooding

The most likely cause of the flooding was the extensive rainfall event on 28<sup>th</sup> June 2012 and 23<sup>rd</sup> July 2013 which caused large volumes of surface water to flow down the track from the fell side next to Town Head Farm, overflow from Croglin Beck and flow from the blocked drain near Quarry Farm. The volume of dirty surface water overwhelmed all highway drains in the village. Highway drainage would have been affected also by the blockages in the system from tree roots near to the church.

## Flooding History

LFRM have received no information regarding flooding prior to 28<sup>th</sup> June 2012.

# Recommended Actions

Action by	Recommended Action	How
CCC Highways/LFRM	Ensure gully pots and connecting pipework is clean. Carry out further investigation where tree roots have been identified outside St John's Church.	Use jetting equipment to clear silt and debris from gully pots and connecting pipework – ONGOING
CCC LFRM	Investigate sources of surface water that flow on to the track from the fells next to Town Head Farm	LFRM staff have visited during heavy rainfall and will be working to ensure works are carried out to make sure the lower cross-ditch is properly reinstated to deflect water
CCC Highways	Attempt to capture surface water flowing down track next to Town Head Farm towards village	Reinstate lower cross ditch on track next to Town Head Farm and replace 2no gully covers and re-profile road around the gullies between Quarry Farm and Town Head Farm
CCC Highways/LFRM	Identify possible methods of preventing ponding on the B6413 near to Croglin Bridge	Identify most suitable method and identify funding sources to reduce risk
Riparian Landowner	Improvements to Croglin Beck banks to prevent flows escaping downstream from Holme View	Increase height of watercourse bank to prevent overspill. COMPLETED
CCC LFRM	Identify ownership of blocked drainage pipe near Quarry Farm	Request riparian owners to clear their section of the blocked culvert. (part under highway) - ONGOING
CCC LFRM	Consider options to prevent future flooding.	CCC LFRM to review possible options and where appropriate apply for FCRM GiA funding. Next FCRM GiA submission date is March 2014.
Natural England	Catchment Management Officer to liaise with landowner to investigate runoff from fell side and farm buildings	Support land owner to identify best methods to deal with surface water
Residents	Continue to report flooding issues to the relevant authorities	Use contact details in Appendix 3 to report any future flooding

Residents	Consideration of Community Action Plan	Identify actions to prevent damage and assist vulnerable people during an event
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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.

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## 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.

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# 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
FWMA	Flood and Water Management Act 2010
LDA	Land Drainage Act 1991
WRA	Water Resources Act 1991

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

The Flood Risk Regulations 1999 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
<b>RIVERS</b>					
Main river					
Ordinary watercourse					
<b>SURFACE RUNOFF</b>					
Surface water					
Surface water on the highway					
<b>OTHER</b>					
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.



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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.

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## Appendix 3: Useful contacts and links

**Cumbria County Council (Local Flood Risk Management):**  
[lfrm@cumbria.gov.uk](mailto:lfrm@cumbria.gov.uk), [www.cumbria.gov.uk](http://www.cumbria.gov.uk), tel: 01228 221330

**Cumbria County Council (Highways):**  
[highways@cumbria.gov.uk](mailto:highways@cumbria.gov.uk), [www.cumbria.gov.uk](http://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):**  
[Jeff.tweddle@cumbria.gov.uk](mailto:Jeff.tweddle@cumbria.gov.uk), [www.cumbria.gov.uk](http://www.cumbria.gov.uk), tel: 01768 812661

**United Utilities:** [www.unitedutilities.com](http://www.unitedutilities.com), tel: 0845 746 2200

**Eden District Council:**  
[www.eden.gov.uk](http://www.eden.gov.uk), tel: 01768 817817

**Environment Agency:**  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk), tel: 03708 506 506  
**Floodline:** 0845 988 1188 (24 hour service) or Type talk 0845 602 6340

**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 4: Summary of feedback to draft report

The following information has been received either at the Flood Forum held in Croglin on 25<sup>th</sup> September 2013, or forwarded after from various members of the community including residents, the Parish Council and members of the MSFW group.

- Flooding to driveway at Bridge End
- Subsidence of footpath/vehicle crossings leading to surface water entering yard / driveway
- Involvement of Natural England to retain surface water in the catchment area.

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## Translation services

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