Sandwith

Flood Investigation Report No.40

Flood Events: Summer 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	David White	Andrew Harrison		13th Jan 2014
Draft	Andrew Harrison	Anthony Lane		15th March 2014
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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.

The village of Sandwith in Copeland District suffered from flooding during the excessive rainfall events of the 22nd June and the 30th August 2012. The main cause of the flooding appears to be from surface water runoff from fields previously saturated by a succession of rainfall events, some with durations of nearly 24 hours. Changes in land management practises contributed significantly to flooding in some areas.

Blocked highway drainage also contributed to the flooding but this is not unusual under the circumstances. This drainage is designed to drain the highway and has insufficient capacity to deal with runoff from large areas of land.

7 actions have been identified within the report that would reduce the risk of future flooding. These include improvements in culvert capacity, encouraging landowners to maintain watercourses and investigating options for reducing runoff from high ground close to properties in the village.

Event Background

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

Flooding Incident

Sandwith

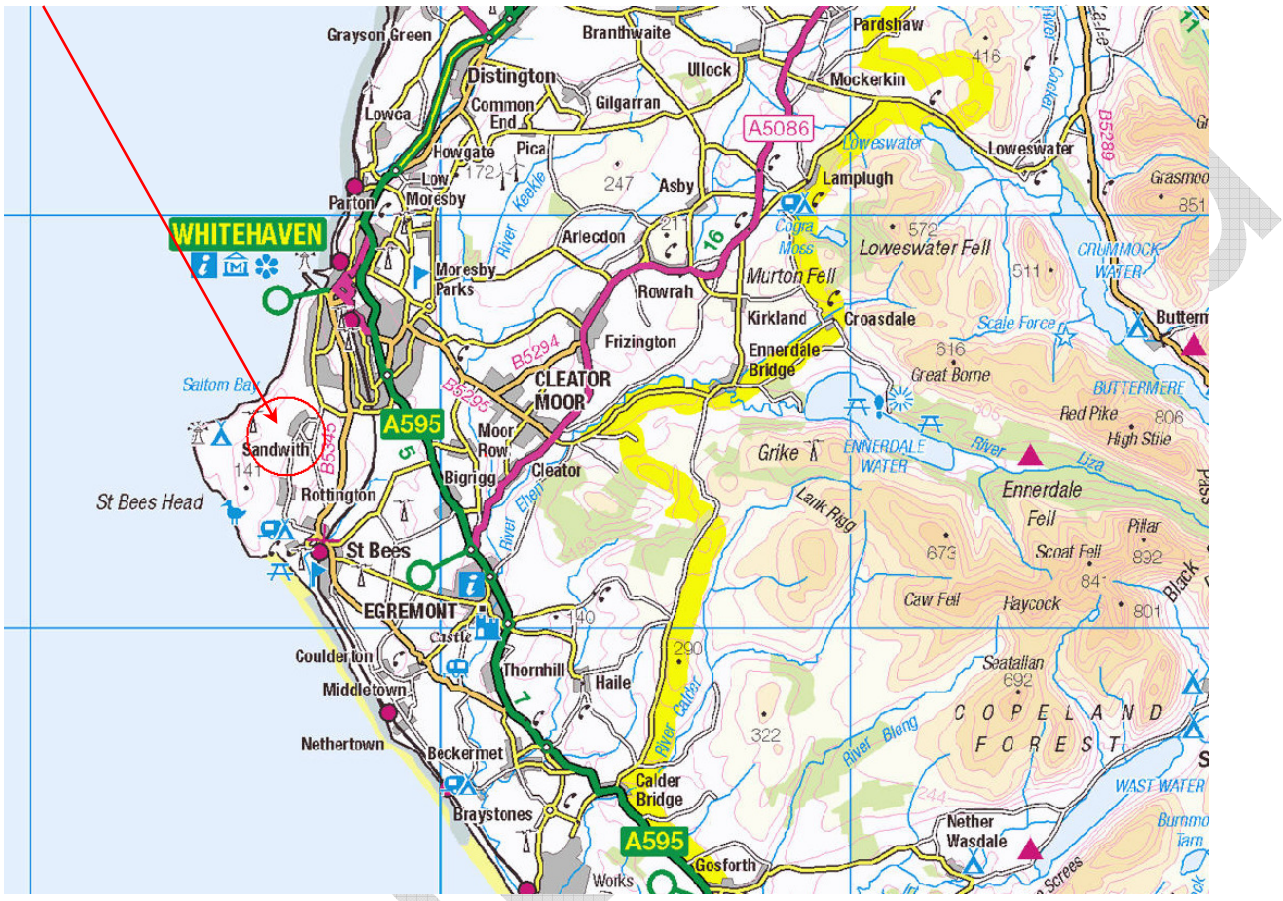

Figure 1: Location Plan.

Sandwith is situated 3½km south of Whitehaven and is about 1¼km from the sea; see Figure 1 “Location Plan”. The village is in a valley with the ordinary watercourse Rottington Beck flowing in a south-westerly direction down through the centre on Main Street; see Figure 2 “Sandwith Village Plan”.

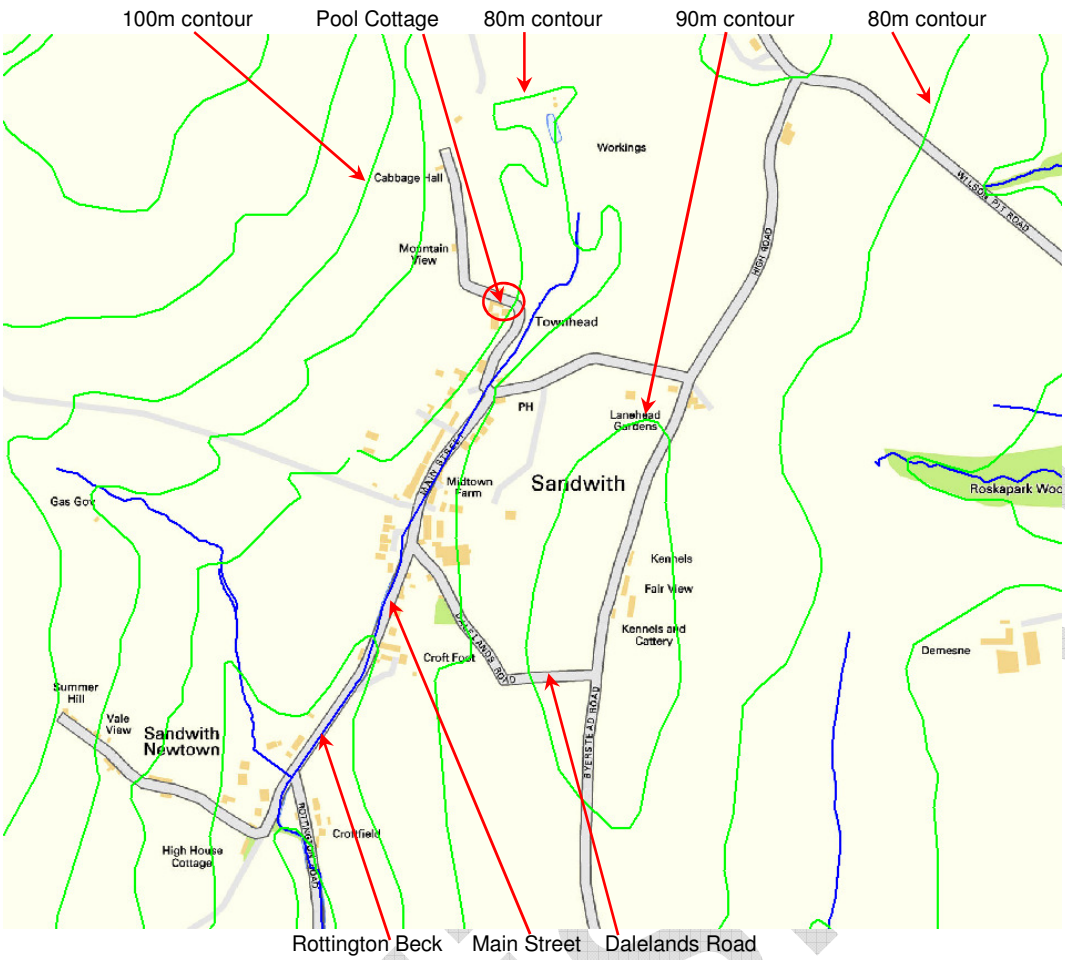

Figure 2: Sandwith Village Plan.

Figure 3: Flooded Properties Location Plan

Investigation

This flooding event was reported to the Environment Agency Incident Room on the 29th August 2012. A flood incident site investigation was carried out by Copeland District Council and Cumbria County Council.

Rainfall Events

The weather radar showed that there was a large amount of rainfall over Sandwith in the first half of June 2012. On the 21st June there was an 8 hour rainfall event with a peak intensity of up to 10mm/hr. On the 22nd June rainfall lasted over 22 hours with peak intensities again up to 10mm/hr.

There were many rainfall events during the month of August in 2012, with some lasting continuously up to 12 hours. The weather radar indicated that there was rain nearly every day over Sandwith in the second half of the month. On 29th August it rained almost continuously from just after 9:30am until just before 3:00am on the 30th August with intensities of up to 20mm/hr.

Map of Flow Routes

Pool Cottage, Sandwith, Whitehaven, CA28 9UG

Figure 2 shows the location of Pool Cottage in the Townhead area of the village.
During heavy rainfall events, surface water runoff, containing silt and debris, flows from fields, and down a lane to discharge into a ditch on the north side of the lane; see Figure 4 “Pool Cottage Flood Routes”. This ditch crosses the lane in a 150mm dia. culvert and then runs alongside Pool Cottage before crossing the lane again to discharge into the Rottington Beck about 30 metres away. The ditch fills with silt from the field, which together with the culverts surcharging, results in flooding in the lane. Over the summer 2012 Pool Cottage did not flood internally because sandbags were used for protection.

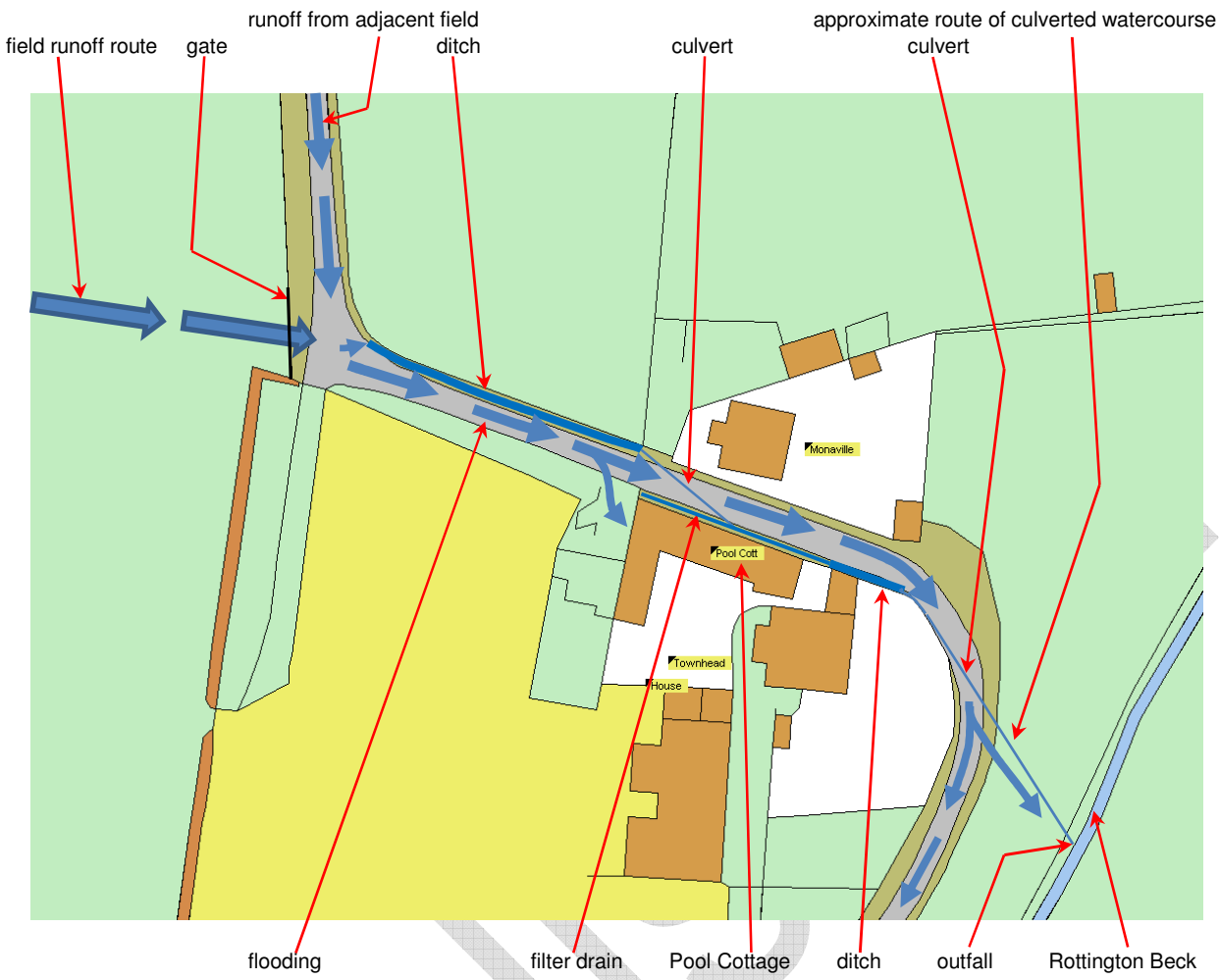

Figure 4: Pool Cottage Flood Routes

This swollen runoff, full of silt and debris, continues down the lane and flows through the village depositing the contents on the way and presenting a flood risk to properties. However at the first bend in the lane by Townhead House, some of this runoff diverts down to Rottington Beck and can block the culvert at the head of the village.

Steel House, Sandwith, Whitehaven, CA28 9UG

Figure 3 shows the location of Steel House in the village along Main Street.
The source of flooding to Steel House was surface water runoff from the fields behind the cottage to the east; see Figure 5 “Steel House Flood Routes”. Following previous flooding, resilience measures were put into place, including a floodgate in the back garden. Unfortunately this was left open on 30th August 2012 and some severe ponding was experienced on the low level patio at the rear of the property. When the floodgate was closed it successfully diverted the floodwaters through the adjacent barn.

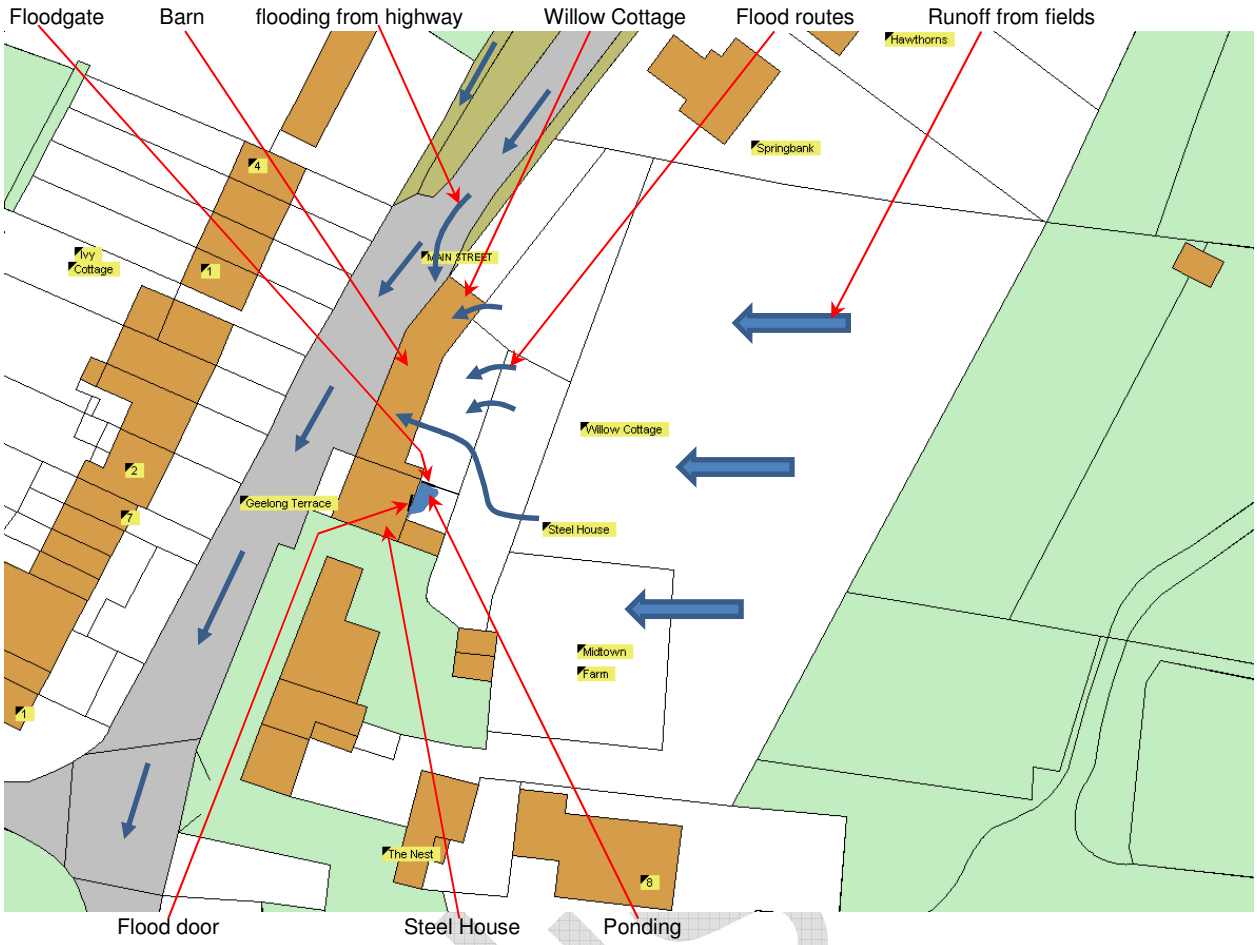

Figure 5: Steel House Flood Routes.

On the north side of Steel House, Willow Cottage was also affected by surface water runoff from the fields and there was internal flooding to the cottage. Some of this flooding was caused by floodwaters from Townhead fields.

Spout House, Sandwith, Whitehaven, CA28 9UG

Figure 3 shows the location of Spout House in the village behind Spout Cottages in Main Street.

Although this was reported as a watercourse problem, the source of flooding to Spout House was surface water runoff from the fields behind the house to the east; see Figure 6 “Spout House Flood Routes”.

Figure 6: Spout House Flood Routes

Aikbank Cottages, Sandwith, Whitehaven, CA28 9UG

Figure 3 shows the location of Aikbank Cottages in the village on Main Street.

Figure 7: Previous Aikbank Cottages' Flood Routes.

No.2 Aikbank Cottage is an end terrace cottage cut into the hillside on it's rear north-western face. It has a long garden with a stable development at a higher level. In the flood event of 22nd June 2012, the main route of the surface water runoff from the fields was intercepted by the sandstone boundary wall between Grandville House and No.2 Aikbank Cottages (see Figure 7 "Previous Aikbank Cottages' Flood Routes"). However the groundwater and surface water flowed through the wall and flooded the garden of No.2, which in turn flooded the garden of No.1 at a lower level.

Subsequent to this flooding, the owner of No.2 carried out some resilience work. A french drain was laid on the south side and parallel to the sandstone wall (see Figure 8) connecting to a pipe through the wall. This pipe continued behind the garage on the north end of the property, through another wall discharging into a shallow trench in public open space. The shallow trench discharges onto the footpath and is intercepted by a gully in the footpath. At the time of the August 2012 flood, the french drain successfully intercepted the runoff from fields and prevented flooding in the gardens of both the cottages.

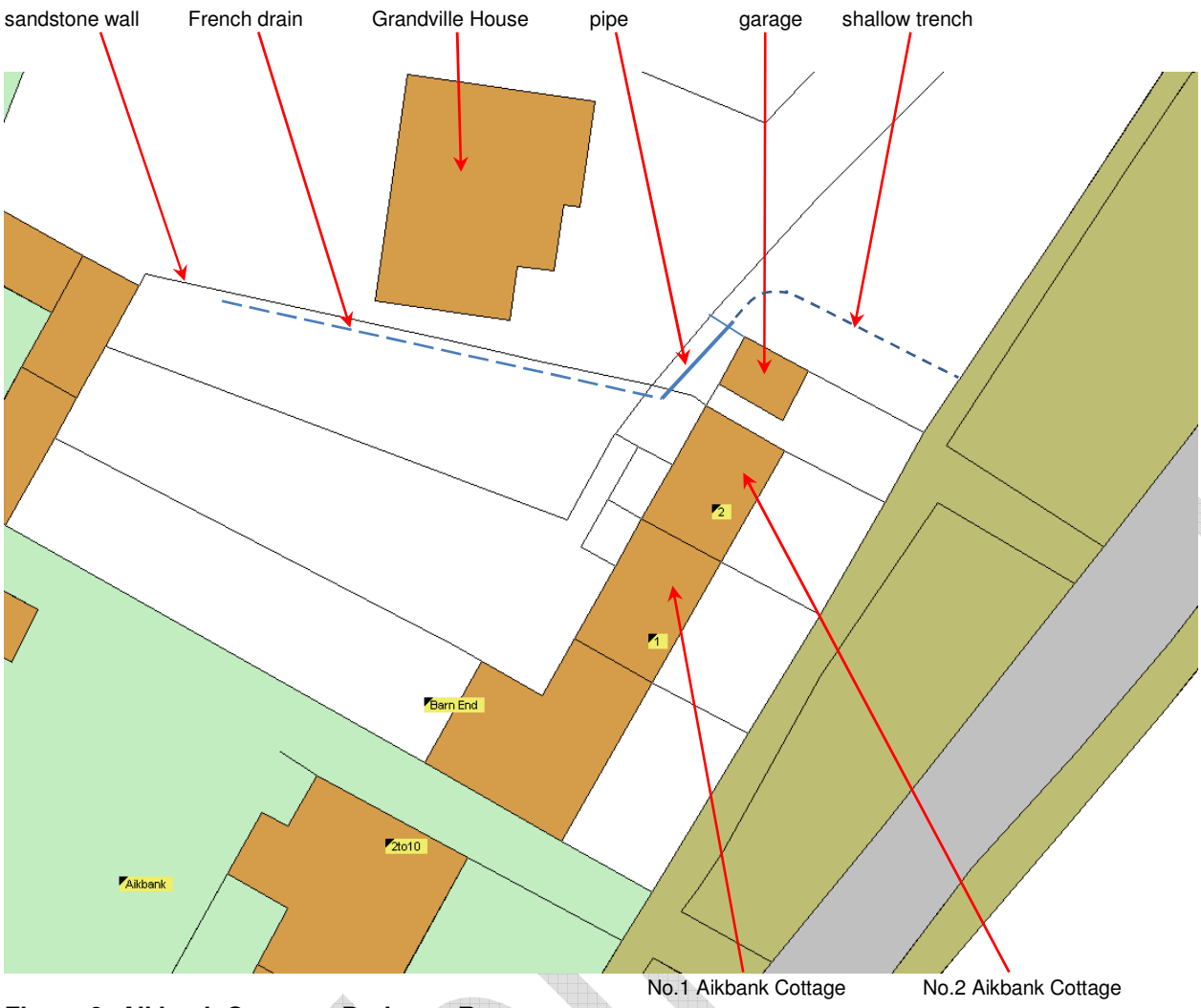

Figure 8: Aikbank Cottages Drainage Route

Figure 9: Rose Cottage and Dale House Flood Routes.

Dale House and Rose Cottage

See Figure 9. Rose Cottage is situated adjacent Rottington Beck with Dale House directly opposite. This is a low lying area in relation to surrounding ground and floodwater on the carriageway in this area was reported to be up to 500mm deep. There is a piped culvert to the front of Rose Cottage that is approximately 1m diameter. It was noted that the size reduces in numerous locations downstream, culminating in a pipe of around half this diameter that discharges into Rottington Beck.

Likely Causes of Flooding

Pool Cottage

Surface water flooding mapping records held by the LLFA shows Pool Cottage as susceptible to flooding. The cause of the flooding was surface water runoff from the fields to the west exacerbated by the ploughing methods adopted. Debris and silt was washed on to the road,blocking drainage ditches and culverts. These drainage features then surcharged causing further flooding to the road threatening Poole Cottage and the village with internal flooding.

This problem has been compounded by the culverts across the lane having been damaged during the laying of a United Utilities foul water sewer about 6 years ago. A CCTV survey has revealed a blockage caused by a deformed pipe in the culvert adjacent to Pool Cottage.

Steel House

Surface water flooding mapping records held by the LLFA shows Steel House as susceptible to flooding. The main cause of the flooding was sheet runoff from fields behind that were already saturated by previous rainfall events. A neighbouring garden lies above the property and beyond this are the fields and buildings of an equestrian centre. The large house connected to the equestrian centre is accessed by a metalled road from the north (see Figure 10). It is unlikely that this metalled road contributed significantly to the flooding to the rear of the properties. However it did contribute to the highway flooding by discharging onto the road junction to the north.

Dale House and Rose Cottage

Surface water runs down both Dalelands Road and the lighthouse road culminating in a large build up trying to flow through a piped culvert (also the main village watercourse) in front of Rose Cottage and Dale House. The pipe that runs across The Green in front of Johnson Close that receives all the surface water from the lighthouse road does not have enough capacity during such severe rainfall events. Excess water then runs further down the road to the Main Street junction before contributing to flows in the open watercourse close to Rose Cottage and Dale House.

The piped culvert in front of Rose Cottage was unable to cope with the volume of water heading to this low point in the village and the build up of water then spilt into the driveway of Rose Cottage and internally into Dale House.

Figure 10: Runoff from fields

Spout House

Surface water flooding mapping records held by the LLFA shows Spout House as susceptible to flooding. Flooding occurred as a result of surface water runoff from fields behind that were already saturated by previous rainfall events.

Aikbank Cottages

Surface water flooding mapping records held by the LLFA shows Aikbank Cottages as susceptible to flooding. It occurred as a result of surface water runoff from fields behind that were already saturated by previous rainfall events. This has been intercepted by a french drain but its discharge has not yet been finalised. Surface water runoff from the recent development behind these properties and adjacent fields should be further investigated in order to review any potential mitigating measures.

Flooding History

Pool Cottage
Flooding at Pool Cottage has occurred over recent years with changes made to ground features, farming methods and damage to culverts.

Steel House
There had been flooding to Steel House previously in 1999, 2009 and some minimal flooding earlier in 2012. In 2009 a floodgate was installed to the edge of the patio and a flood door to the backdoor. Willow Cottage flooded in 2009.

Spout House
It is not known if flooding has occurred at Spout House prior to 2012.

Aikbank Cottages
During the flood event of 22nd June 2012, both Nos. 1 and 2 Aikbank Cottages were flooded from groundwater and surface water runoff from the fields to the west, behind the cottages. The flooding was external.

Rose Cottage
Rose Cottage flooded externally during the storm of 29th August 2012 from groundwater and surface water runoff; a car parked in the driveway was severely damaged. The property was flooded internally a number of years ago.

Dale House
Was internally flooded from groundwater and surface water runoff during the 29th August 2012 storm. No previous flooding has been recorded at this property.

Recommended Actions

Action by	Recommended Action	How
Residents	If previously affected by flooding, ensure that property resilient to future flood events.	Consider whether flood protection is expedient. Seek advice from a competent flood resilience consultant.
Riparian Owners	Maintain flows in watercourses	Establish maintenance regime for clearing foliage and removing silt from sections of watercourses, including culverts, that fall within their area of responsibility.
LLFA/Riparian Owners	Encourage riparian owners to carry out their statutory duties in maintenance of their watercourses.	Seek advice from LLFA on the requirements for Flood Defence Consent.
UU/Land owner	Investigate damaged culverts at Townhead.	Agreement how the repair of the damaged culverts should be carried out. **Completed**
LLFA/County Highways	Investigate potential for enhancing highway drainage, including culverts in the area of Rose Cottage, Dale House and Main Street.	Budget for work in the future.
LLFA/CBC/EA/Residents/Landowners of fields above village	Investigate options for intercepting surface water flows from fields with cut-off ditches and/or land drains	Open forum for dialogue between the stakeholders on feasibility and possible locations of land drainage.
Farmers	Review land management to avoid flooding to neighbouring land from fields.	Change ploughing directions, heavy vehicle tracking routes, cattle circulation routes, etc. Seek advice.

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 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
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: Useful contacts and links

To report flooding: Incident hotline tel. 0800 80 70 60 (24hrs)
Floodline: tel. 0845 988 1188

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

Cumbria County Council Neighbourhood Forum: tel. 01946 505022
Cumbria.gov.uk/sayit

United Utilities: tel: 0845 746 2200

Copeland Borough Council
info@copeland.gov.uk, www.copeland.gov.uk, tel. 0845 054 8600

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

Translation services

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如果您希望通过母语了解此信息，
请致电 **01228 606060**

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