CARLISLE CITY COUNCIL
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AGENDA

Environment and Economy Overview and Scrutiny Panel

Thursday, 28 July 2016 AT 10:00
In the Flensburg Room, Civic Centre, Carlisle, CA3 8QG

Apologies for Absence

To receive apologies for absence and notification of substitutions

Declarations of Interest
Members are invited to declare any disclosable pecuniary interests, other registrable interests and any interests, relating to any item on the agenda at this stage.

Public and Press
To agree that the items of business within Part A of the agenda should be dealt with in public and that the items of business within Part B of the agenda should be dealt with in private.

Minutes of Previous Meetings **5 - 16**

To approve and sign the Minutes of the meetings held on 14 April 2016 and 30 June 2016.
[Copy Minutes in Minute Book Volume 43(1) and 30 June attached].

PART A

To be considered when the Public and Press are present

A.1 CALL-IN OF DECISIONS

To consider any matter which has been the subject of call-in.

A.2 OVERVIEW REPORT AND WORK PROGRAMME **17 - 22**

To consider a report providing an overview of matters related to the work of the Environment and Economy Overview and Scrutiny Panel, together with the latest version of the Work Programme and details of the Key Decisions items relevant to this Panel as set out in the Notice of Executive Key Decisions.
(Copy Report OS.15/16 herewith)

A.3 FLOOD REPORTS **23 - 188**

(Cross Cutting)

Andy Brown, Flood and Coastal Risk Manager, Cumbria and Lancashire Area and Angela Jones, Assistant Director of Economy and Environment, Cumbria County Council have been invtied to attend the meeting to give an overview of the Section 19 reports and Cumbria Flood Action Plan for Carlisle and District.
(Copy Reports attached)

A.4 RETHINKING WASTE PROJECT UPDATE **189 - 200**

(Environment and Transport)

The Neighbourhood Services Manager to provide an update on the progress of the Rethinking Waste Project and key issues going forward.
(Copy Report LE.14/16 herewith)

A.5 LOCAL ENFORCEMENT PLAN **201 - 216**

(Economy, Enterprise and Housing)

The Director of Economic Development to submit an updated Local Enforcement Plan as required by the National Planning Policy. The matter was considered by the Executive on 4 July 2016. (Copy Report ED.28/16 and Minute Excerpt herewith)

PART B

To be considered when the Public and Press are excluded from the meeting

-NIL-

Members of the Environment and Economy Overview and Scrutiny Panel

Conservative – Christian, Mitchelson, Nedved (Chairman), Bloxham (sub), Mrs Parsons (sub), Mrs Mallinson (sub)

Labour – Bowditch (Vice Chairman), Mrs Coleman, Dodd, McDonald, Burns (sub), McNulty, Ms Patrick (sub)

Independent – Betton, Paton(sub)

Enquiries, requests for reports, background papers, etc to Committee Clerk: Jacqui Issatt - 817557

ENVIRONMENT AND ECONOMY OVERVIEW AND SCRUTINY PANEL

THURSDAY 30 JUNE 2016 AT 10.00AM

PRESENT: Councillor Nedved (Chairman), Councillors Betton, Bloxham (as substitute for Councillor Mitchelson), Christian, Mrs Coleman McDonald and Ms Patrick (as substitute for Councillor Bowditch)

ALSO PRESENT Councillor Glover – Leader (until 11.30am)
Councillor Southward – Environment and Transport Portfolio Holder (until 11.32am)
Councillor Mrs Bradley – Economy, Enterprise and Housing Portfolio Holder
Councillor J Mallinson - Observer

OFFICERS: Deputy Chief Executive
Director of Resources
Director of Economic Development
Neighbourhood Services Manager
Policy and Performance Officer
Overview and Scrutiny Officer

EEOSP.29/16 APOLOGIES FOR ABSENCE

Apologies for absence were submitted on behalf of Councillor Mitchelson, Councillor Bowditch and Councillor Dodd.

EEOSP.30/16 DECLARATIONS OF INTEREST

Councillors Bloxham, Ms Patrick and Nedved declared an interest in accordance with Council's Code of Conduct in respect of Section 2 of report PC.10/16 which gave an update on a project at Rosehill car park (Agenda item A.5). The Members interest related to the fact that they were members and a substitute on the Development Control Committee. The Members agreed not to take part in any discussion on this project.

EEOSP.31/16 PUBLIC AND PRESS

RESOLVED – That the Agenda be agreed as circulated.

EEOSP.32/16 CHAIRMAN'S COMMENTS

The Chairman welcomed the Panel and new Members to the first meeting of the municipal year.

He expressed his deep sadness on the passing of Councillor Ged Caig who had been the Vice Chairman of the Panel for two years. Councillor Caig had made an important contribution to the Panel during his time on the Panel and his loss would be sorely felt by all Members of the Panel.

EEOSP.33/16 MINUTES OF PREVIOUS MEETINGS

With regard to minute EEOSP.22/16 of 14 April 2016 a Member asked if the Rethinking Waste Cross Party Working Group could meet for an update prior to the next meeting of the Panel on 28 July 2016.The Environment and Transport Portfolio Holder informed the Panel that the Rethinking Waste Project Board was due to meet on 30 June and one of the agenda items was to discuss how the Project Board could better communicate the information regarding the Project. The Deputy Chief Executive confirmed that a meeting of the Cross Party Working Group would be arranged prior to the next Panel meeting.

A Member referred to a question he asked at the previous meeting (minute EEOSP.28/16 refers) regarding the toilet facilities in the Lanes and asked for a further update. He also asked that the matter come back to the Panel. The Leader informed the Panel that he had raised the matter with the Lanes management and had been informed that a new location for the public toilets had been found. Negotiations were underway to free the space to allow for the new toilets to be installed.

RESOLVED – 1)The minutes of the meeting held on 3 March 2016 be approved and signed by the Chairman.

2) The minutes of the meeting held on 14 April 2016be noted.

3) That a meeting of the Rethinking Waste Cross Party Working Group be arranged prior to the next meeting of the Panel on 28 July 2016.

EEOSP.34/16 CALL-IN OF DECISIONS

There were no items which had been the subject of call-in.

EEOSP.35/16 OVERVIEW REPORT AND WORK PROGRAMME

The Overview and Scrutiny Officer presented report OS.13/16 providing an overview of matters related to the work of the Environment and Economy Overview and Scrutiny Panel.

The Overview and Scrutiny Officer reported that the most recent Notice of Key Executive Decisions had been published on 3 June 2016. This had been circulated to all Members for information and no items fell into the remit of the Panel.

The Overview and Scrutiny Officer drew Members' attention to the work programme which had been attached as appendix 1 to the report. Members, Portfolio Holders and officers were asked to give consideration to issues which scrutiny could add value to during the Civic Year and building them into the work programme for the Panel. Guidance on scrutiny agenda planning had been attached to the report as appendix 2 and Members were encouraged to use the prioritisation aid contained within the guidance to ensure that items placed on the work programme were those that scrutiny could add value to.

The Deputy Chief Executive and the Director of Economic Development had been invited to attend the Panel to discuss priority areas within the Panel's remit.

The Director of Economic Development outlined the following matters as a priority for the Panel's work programme:

Local Enterprise Partnership – The Local Enterprise Partnership (LEP) were working on the growth fund 3 bid, for submission in July, which covered a number of priority projects in the City Centre. This would be the last round of funding in this parliament and it was important for the regeneration of the City. It was suggested that the matter be scheduled for consideration by the Panel in September/October when the details of the bids had been developed.
In addition the annual overview report for the LEP would be made available for the Panel in early 2017.
Two key priority projects for the growth fund 3 bid werethe Carlisle Railway Station and the Citadel. A bid for £13.76m was being made for improvements to Carlisle Railway Station which would enable improvements to the infrastructure and to the station itself to provide a hub and connectivity for the whole of Cumbria and South West Scotland.Cumbria County Council would vacate the Citadelwhen there new purpose built offices were completed and options were being prepared on how best to deal with the empty buildings.
Local Plan – The Inspectors report had been completed and officers were checking it before it was brought to Council in September for the final sign off. The Local Development Scheme would be the next stage following the sign off of the Local Plan. The Community Infrastructure Levy (CIL) had been included on the work programme with the Local Plan item. The CIL was a levy collected from properties in new development that contributed to the infrastructure in the development. The process for the CIL was very technical and required a lot of work.
The Director stressed the importance of continuing the Cross Party Local Plan Working Group in taking forward the Local Development Scheme.

A Member commented that it was important that the development of the Citadel was carried out correctly as it was the entrance to the City and held rooms such as the old court rooms which were of historic value. He asked what involvement the City Council and Members would have in the development plans.

The Director of Economic Development agreed that the Citadel was an important iconic building and was the first impression of the City from the station. The building was historic in its own right and was a listed building which needed to be looked after. The City Council was working with Cumbria County Council on the options which were available; when these were ready they would come through the Council's decision making process. It was hoped that a draft document would be ready for Members by the autumn.

A Member asked how responses from the public consultation had been used in the preparation of the Local Plan. The Director of Economic Development explained that each step of the Local Plan had been the subject of public consultation. The Inspector had considered all of the consultation responses and taken them into account when preparing her report.

The Chairman reminded the Panel that the Local Plan had been the subject of various consultations over a two year process and had been to the Panel on several occasions.

The Deputy Chief Executive reminded the Panel that both himself and the Portfolio Holder were new to the Local Environment work and would require a period of adjustment. He then outlined the following matters as a priority for the Panel's work programme:

Rethinking Waste – this would remain a priority for the Panel for the next year.
Car Parking – this would consider target income, flood recovery, future plans and the change to the culture of car parking.

Tourism–the contribution of the City Council to the development of tourism and its day to day operations.
Commercialisation of Parks - the name of the priority would be changed as it did not reflect the nature of the matter. The priority was about getting an appraisal of progress made at Talkin Tarn and looking to see if the principles of the successful business plan at Talkin Tarn could be applied to other green spaces such as Bitts Park and Hammonds Pond.

RESOLVED – 1) That the Overview Report (OS.13/16) incorporating the Work Programme and Notice of Executive Key Decision items relevant to this Panel be noted.

2) That the following items be scheduled in the Panel's Work Programme:

- Local Enterprise Partnership – Growth Fund 3 Bid – September/October 2016
- Local Enterprise Partnership – Annual Update – January 2017
- Local Plan – September 2016

EEOSP.36/16 DECEMBER 2015 FLOOD UPDATE REPORT

The Deputy Chief Executive submitted report SD.10/16 which was part of a series of update reports prepared for Overview and Scrutiny Panels on flood recovery activities and future programmed work.

The reports contained a generic section designed to give all Panels an overview of flood recovery work and a more specific section tailored to the work areas of each Committee, included in the report were specific updatesrelating to:

- Local Environment –
  Green Spaces: new equipment was due to be installed in Bitts Park in July and work had begun on the splash park and re-surfacing.
  River Banks: consideration was being given to the options available regarding damaged river banks in Bitts Park and the Sheepmount. Bingham Yates engineering consultants were surveying the river banks and access track and the Sheepmount and would produce an options report for the Council.
  Charlotte Terrace Play Area: the play area in Botcherby was being replaced.
  Allotments: flooded allotments were now up and running
- Customer Contact and access to services -
  The temporary customer contact centre was operational and the call centre continued to be located on the first floor. The facilities were functioning well; efficiently maintaining access to the Council's front of house public services and delivering other public sector partner services.
- Flood grants and household payments-
  Community Support Grant: 1,554 households within the district had received the Community Support Grant of £500 amounting to £777,000 of grant. The money was being recovered from Cumbria County Council upon submission of fortnightly claims.
  Flood Resilience Grants:431 grant applications had been received and granted funded measurers to 344 properties (5 were not eligible and 82 were incomplete), totalling £1,141,988. Of these the Council had paid out 116 grants totalling £396,214 which was recoverable from Cumbria County Council.
  Council Tax & NNDR Discount Schemes: Council tax discounts had been awarded to 2,107 householders which amounted to £778,455.03 up until 31 March 2016. Business Rates discount had been awarded to 102 businesses amounting to £213,047.32 up to 31 March 2016; and a further £321,000 awarded in respect of

2016/17. The total number of businesses affected was 205, with 96 properties now being re-occupied.
The total number of households still unable to return to their properties as a result of Storm Desmond was 928.

- City Council property and asset recovery –
  WYG had assisted the Council to develop a property recovery plan and tackle immediate recovery issues such as making safe and stripping/drying out assets. A central part of the work had been a surveying exercise to establish the post flood condition and reinstatement cost of over 60 assets ranging from the Civic centre to minor items. The completion of the surveyors was imminent and the next phase of works procurement had begun.
- Financial considerations and activities –
  Bellwin Scheme: The Bellwin Claim had been submitted and the City Council's total eligible expenditure was £404,398 of which the Council had to meet the first £26,486 which had been included in the 2015/16 outturn. The claim included £14,984 submitted on behalf of Greystone Community Centre.
- Car Park recovery –
  A full survey of the car park machines had been completed and 16 of the 27 ticket machines were flooded beyond repair. The City Council's insurance company had agreed to pay to replace the flood damaged machines. The ambition was to replace the flood damaged machines with the new model machines and then phase in the replacement of the other 11 machines to upgrade them to card and cashless payment facilities. In addition to the procurement of updated replacement machines Council officers had also undertaken surveys of all car park surfaces, lighting and fences and repairs had been undertaken and a programme of repair and improvement was being prepared.
- The Council continued to play a full role in liaising with the Environment Agency, County Council and other groups and bodies in supporting the community and businesses.

The Community Overview and Scrutiny Panel and the Resources Overview and Scrutiny Panel had both received flood update reports relevant to their Panels and both had felt that future update reports should focus more future action.

In considering the report and presentation Members raised the following comments and questions:

- Could the plans for the play equipment in Bitts Park be made public?

The Deputy Chief Executive explained that details of the installation date had not been finalised but the proposed equipment type could be made public.

- A Member asked for a robust plan along with costs for the works to be undertaken at the riverbanks. He had attended a meeting between Cumbria County Council and the Environment Agency and had been concerned that there had not been any City Councillors at the meeting and only one officer representative. A number of issues had been raised at the meeting such as bridge work and dredging work and the Member asked if the concerns had been passed on for consideration.

The Deputy Chief Executive reminded the Panel that the responsibility for the riverbanks was dependent on the ownership. Bingham Yates would survey the damage and produce a report setting out the Council's options for areas that fell within their responsibility and

this would come through the decision making process. Bridges and dredging of rivers was not the responsibility of the City Council, however, the City Council did liaise with partners such as the Environment Agency as part of the section 19 report.

The Deputy Chief Executive added that the meeting that the Member had attended had been a lead agency meeting which the City Council had officer representation. Officers had also attended a second meeting at Crosby and their presence and advice had been well received.

Councillor John Mallinson confirmed that officers had attended the meeting at Crosby and their advice had been welcome and productive.

The Leader added that the lead agency meeting had taken place over two days and he had attended the first meeting. He reassured the Panel that the City Council was actively involved in the flood recovery.

- Members recognised the difficulties the City Council had with regard to responsibilities and asked what lessons had the Local Authority learned that could be actioned by the Council?

The Deputy Chief Executive responded that the City Council's main lessons learned regarded resilience measures that would help with recovery rather than preventing the flood. Resilience measures would be built into the renovation of flooded Council assets to make the recovery quicker. An example was the movement of the electricity from the ground floor to the first floor of the Civic Centre and the move from mainframe storage to cloud storage. Work was also being undertaken on the Council's Business Resilience Plan and the location of reception centres.

A Member commented that the Council could be more proactive and carry out practical works such as ensuring gulleys were cleared to help avoid smaller localised flooding.

- What proportion of the Winter Flood Plan covered aspects of resilience before the winter?

The Deputy Chief Executive explained that the Flood Plan was a cross cutting document with a number of agencies. The Plan, at the moment, was to be flood ready rather that resilient. There were some issues which needed to be resolved and communicated but the nature of the Plan was for it to be clear to people which public agency carried out which actions and how they would help people. There would be more information on the Plan in the next report to the Panel.

The Economy, Enterprise and Housing Portfolio Holder added that the Council needed to look much further forward and the Local Plan would help with future planning. The Local Plan had been amended to reflect the impact of climate change and potential local flooding. She explained that being a flood risk area did not prevent development but it did mean the development must be flood resilient. Consideration should be given to how the Planning Authority could encourage construction companies to build flood resilience measures into developments.

- Were the Community Action Plans similar to the Winter Flood Plan and did they work together?

The Deputy Chief Executive clarified that the two Plans were different. The Winter Flood Plan's aim was to communicate clearly the roles of various agencies. The Community Action Plans made sure that people received practical support. Both Plans had to be monitored and tested.

The Leader added that both Plans would fit together to make sure everyone had an understanding of their role should the flood happen again.

- Only 96 businesses properties had been re-occupied out of the 205 which had been affected, where had the businesses gone?

The Director of Resources replied that a number of the businesses that had been affected were small local businesses. Many of those businesses had relocated to other areas of the City.

- A Member asked for an update on the allotments.

The Deputy Chief Executive replied that the allotments were open following the provision of skips from the Council. He agreed to provide a written response to the Panel with regard any reductions that had been offered to the ground rent.

- How much would the survey of the riverbanks cost?

The Deputy Chief Executive informed the Panel that further details of the survey and costs would be included in the Panel's next report.

- Was there a breakdown of the £25m capital that the Chancellor had announced would be made available?

The announcement from the Chancellor had stated that the money would be drawn down for improvements to flood defences but there had been no further details made available.

- Would the play area at Eden Park be improved as a result of increased funding?

The Deputy Chief Executive clarified that the funding for the play area was coming from two different streams but it was not increased funding. He added that the Council continued to follow its existing policy on play areas in the City which had been approved by full Council.

RESOLVED –1) Thatthe flood update report (SD.10/16) be noted.

2) That the next Flood Update report to the Panel include:
- Future actions that will be taken by the City Council and other agencies
- Further details on the Winter Plan 2016/17
- Further information on Council asset recovery

3) That the Deputy Chief Executive provide a written response updating Members of the Panel on the support offered to allotment holders.

EEOSP.37/16 DISCRETIONARY RATE RELIEF POLICY – LARGE EMPTY 'HARD TO LET' BUSINESS PREMISES

The Director of Resources submitted report RD.11/16 concerning the City Council's Discretionary Rate Relief Policy.

The Director of Resources indicated that, as Members were aware, currently the Council was allowing re-occupation relief in granting a 50% discount from business rates for new occupants of previously empty retail premises. That was allowed for 18 months with the cost of relief met by Government Grant. The scheme finished on 31March 2016.

Whilst the scheme helped in getting hard to let retail premises occupied (particularly in Earls Lane), it did nothing to assist in terms of the occupation of hard to let offices and other commercial premises. Although the Council was bucking the trend in terms of vacant properties, 32 large commercial premises were currently empty (Appendix 1). The Executive wished to bring those premises back into use in order to attract jobs to the City and recoup relevant rates.

Other authorities were now taking advantage of new discretions under Section 69 (5) of the Localism Act 2011 to encourage new businesses into their districts by offering 'rate holidays' when occupying empty commercial premises. The City Council needed to be in a position to offer similar incentives if it wished to compete with those authorities.

Due to the fact that any decision to offer such discretionary rate relief could only be made if considered reasonable having regard to the interests of Council Tax payers the main beneficiaries would be firms bringing employment opportunities to Carlisle.

The Director of Resources indicated that in the Carlisle Plan the Council actively promoted Economic Development. Under actions supporting the Plan the Council could actively support businesses looking to relocate to Carlisle with a package of assistance including a rate free holiday, for occupying empty difficult to let commercial property and other incentives e.g. subsidised parking. The businesses would need to commit to Carlisle for a minimum of 5 years and create job opportunities and other benefits for the Carlisle economy.

He further explained that Discretionary Rate Relief for such a scheme would be met by the 'Collection Fund' i.e. 50% by Government, 10% by the County Council and 40% by the City Council. However, due to the workings of the Localised Business Rates Scheme, in many circumstances the scheme would be self-financing in the medium to long term. The Council would fund its cost of granting discretionary relief via an invest to save arrangement on its NNDR collection fund arrangements. Details of the risks associated with invest to save proposals were highlighted for the benefit of Members.

The Director added that, subject to Members agreeing the discretionary empty rate holiday initiative, the Council's Discretionary Rate Relief Scheme needed to be drafted to cover:

- Definition of hard to let empty commercial premises
- 5 year commitment of business to the City
- Jobs likely to be created
- Other benefits to Carlisle relocation
- Other assistance that could be offered in any relocation package (outwith Discretionary Rate Relief Scheme)

Suggested draft amendments to the Council's Scheme were provided at Appendix 2.

The Executive had considered the matter at their meeting n 4 April 2016 (EX.25/16 refers) and resolved:

"That the Executive:

1. Had considered the proposed amendment to the City Council's Discretionary Rate Relief Policy as set out in Appendix 2 Section (4) for the reasons detailed in Report RD.60/15 before referring it to the Resources and Environment and Economy Overview and Scrutiny Panels for consideration and comment back to the Executive before a recommendation to Council.
2. Noted that any applications for discretionary rate relief under the revised Policy would be considered by the Executive on an individual basis who would determine, in considering a Business wanting to locate to Carlisle proposals, whether that was in the interests of Carlisle City Council Taxpayers before considering granting discretionary rate relief."

In considering the report Members raised the following comments and questions:

- In response to a Member's question the Director of Resources confirmed the ownership of the land at Viaduct Estate. He explained that although all of the properties listed in appendix 1 of the report were empty there was no guarantee that the propertieswould be occupied due to a number of factors including economic factors or the condition of some of the properties.

- What involvement did the Council have with local landlords who found themselves with properties that were difficult to let?

The Director of Resources responded that when the Discretionary Rate Relief Policy was amended it would be used as a tool to attract business to Carlisle.

- A Member noted that the list of hard to let properties was diverse and included retail premises not just commercial premises.

The Director of Resources informed the Panel that retail premises were often temporary and the amendment to the Policy was to encourage large employers, he added that should a large retailer apply for the discretionary rate relief in a hard to let property then the Executive would consider the application.

- Was the amendment to the Policy just for new businesses coming into Carlisle or could local businesses wishing to expand apply for the relief?

The Director of Resources confirmed that the amendment was primarily to encourage new businesses into the area but if a local business wished to expand, and it was of benefit to local council tax payers, then the business could apply for the rate relief.

- Was there any way the Council could mitigate the risks to ensure businesses stayed for the required five years?

The Director of Resources explained that there would be a contract between any large businesses moving into hard to let premises and the Council which stipulated the criteria for the discretionary rate relief, however, there would still be some risks as businesses could become bankrupt.

- Who would make the decision with regard to applications received?

The Director of Resources explained that when an application was received officers would carry out all of the necessary investigative work and ensure everything was correct before preparing a report for the Executive to consider with the application. The Executive would consider each application on an individual basis.

- When would the amendment be implemented?

The Director of Resources responded that the implementation date would be clarified and included in the final report to Council.

Members agreed that businesses should be encouraged to come to Carlisle and local businesses should be encouraged to help Carlisle grow but felt strongly that all of the correct checks and balances were in place to mitigate any risks.

RESOLVED – 1) That the Discretionary Rate Relief Policy – Large Empty 'Hard To Let' Business Premisesreport (RD.11/16) be noted;

2) That, subject to the final approval of Council, the Panel received feedback on the outcome of the implementation of the Policy at a future date.

EEOSP.38/16 END OF YEAR PERFORMANCE REPORT 2015/16

The Policy and Performance Officer submitted report PC.10/16 which updated the Panel on the Council's service standards that helped measure performance and included updates on key actions contained within the new Carlisle Plan.

The report contained information against new priorities/activities which were contained in the new Carlisle Plan 2015-18 and included Freedom of Information figures which Members had previously requested.

Members first considered the Service Standards, section 1 of the report:

- Was there more information available on the background to the corporate complaints service standard?

The Deputy Chief Executive informed the Panel that the Resources Overview and Scrutiny Panel would be considering a detailed report regarding corporate complaints. The complaints set out in the report covered a range of issues but managers were monitoring them closely to determine in patterns in services of effects of decisions made by the Council. The corporate complaint procedure had been amended to give set deadlines and training had been given on the policy along with letter writing skills.

- A Member congratulated the Development Control team for processing 93.5% of household planning applications within eight weeks. This was an impressive figure given the increase in planning applications.

- Why had 49 recycling collections been missed?

The Policy and Performance Officer explained that spikes in missed collections in July and January can be explained by a Police incident in July and the impact of the December 2015 flooding. The Deputy Chief Executive added that both himself and the Town Clerk and Chief Executive received daily reports on missed collections and assured the Panel that the situation was being monitored very closely. There had been some changes to recruitment and job descriptions in Waste Services and it was hoped these changes would improve the number of missed collections.

- Were there any combined figures for household recycling taken to sites and business recycling?

The Deputy Chief Executive agreed to investigate further the possibility of reporting figures for recycling at sites and by businesses.

- Had there been any additional steps taken to encourage more recycling?

The Deputy Chief Executive reported that there had not been any new additional steps taken but further work would be undertaken as part of the Rethinking Waste project.

Members then considered the Carlisle Plan 2015-18 Summary, section 2 of the report:

- Had access to play areas for disabled children been looked at when new play areas were being installed? A Member commented that he had raised the issue before the new Melbourne Park play area had been installed but inclusive equipment had not been placed in the play area.

The Economy, Enterprise and Housing Portfolio Holder informed the Panel that play areas fell within the remit of the Community Overview and Scrutiny Panel. She reminded the Panel that full Council had taken the decision to install specialist equipment in the major and most popular play areas which was Bitts Park and Hammonds Pond. The equipment was very expensive and although the Council had the aspiration to place specialist equipment in plays areas the financial difficulties prevent this work.

Each Ward Councillor receives a small amount of money each year which could be contributed to local play areas and many areas had 'friends of' groups which had been very successful in applying for funding which was not available to the Council. She stressed that the Council did its best to meet the aspirations and expectations of the local community but it was not always possible to that due to funding. The Council was making very difficult decisions about where funding went whilst fulfilling its statutory obligations.

A Member commented that the new play area at Melbourne Park had been funded by Section 106 monies from the St Aidan's area but the money had been limited and the Council had provided the best it could with the money available.

RESOLVED –That the end of year performance report 2015/16 (PC.10/16) be noted,

(The meeting ended at 12.25pm)

CARLISLE CITY COUNCIL

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Environment & Economy Overview and Scrutiny Panel

Agenda Item: **A.2**

Meeting Date:	28 July 2016
Portfolio:	Cross Cutting
Key Decision:	No
Within Policy and Budget Framework	
Public / Private	Public

Title:	OVERVIEW REPORT AND WORK PROGRAMME
Report of:	Overview and Scrutiny Officer
Report Number:	OS.15/16

Summary:

This report provides an overview of matters related to the Environment and EconomyO&SPanel's work. It also includes the latest version of the work programme.

Recommendations:

Members are asked to:

- Decide whether the items on the Notice of Key Executive Decisions should be included in the Panel's Work Programme for consideration.
- Note and/or amend the Panel's work programme.

Contact Officer: **Sarah Mason** **Ext: 7053**

Appendices attached to report:

1. **Environment & Economy O&S Panel Work Programme 2016/17**

1. **Notice of Key Executive Decisions**

   The most recent Notice of Key Executive Decisions was published on 1st July 2016.

   This was circulated to all Members. The following items fall within the remit of this Panel:

   KD.13/16 Adoption of Carlisle Local Plan 2015-2030

   The Executive will be asked to consider the Carlisle District Local Plan 2015-2030 and make it available for consideration by Environment and Economy Overview and Scrutiny Panel before being reported back to Executive on 26 September 2016 to consider referral to Council on 8 November 2016 for adoption.

   KD.14/16 Parish Charter – Planning Working Agreement

   The Executive will be asked to approve the Planning Working Agreement as part of Carlisle City Council's Parish Charter. The decision will be taken on 1st August 2016.

   KD.15/16 North West Coast Connections Project S42 Consultation Response

   The Executive will be asked to respond to the S42 Consultation on the North West Coast Connections Project. The decision will be taken on 24 October 2016.

2. **References from the Executive**

   EX.56/16 – Local Enforcement Plan – Environment and Economy O&S Panel. On this meeting agenda

3. **Work Programme**

   The Panel's current work programme is attached at Appendix 1. Members are asked to note and/or amend the Panel's work programme and in particular consider the framework for the next meeting.

   The following items are scheduled for the next meeting on 15 September 2016:

   - Performance Monitoring Report
   - Local Plan / Local Development Scheme
   - Business Plan development for Carlisle Parks

Note: in compliance with section 100d of the Local Government (Access to Information) Act 1985 the report has been prepared in part from the following papers: None

ENVIRONMENT AND ECONOMY OVERVIEW AND SCRUTINY PANEL WORK PROGRAMME 2016/17

Appendix 1

Issue Contact Officer	Type of Scrutiny					Comments/status	Meeting Dates							
	Performance Management	Key decision Item/Referred from Executive	Policy Review/Development	Scrutiny of Partnership/ External Agency	Monitoring		30 Jun 16	28 Jul 16	15 Sep 16	27 Oct 16	1 Dec 16	19 Jan 17	2 Mar 17	20 Apr 17
CURRENT MEETING – 28 July 2016														
Flood Update Report Darren Crossley				✓		To consider the Cumbria Flood Action Plan (Environment Agency)	✓	✓						
Rethinking Waste Colin Bowley					✓	Updated business case and detailed project plan		✓		✓		✓		✓
Local Enforcement Plan Chris Hardman		✓				To consider the updated Local Enforcement Plan		✓						
TASK AND FINISH GROUPS														
Flood 2015						Discussed at Scrutiny Chairs Group: Flood update items to each Panel. Workshop (cross Panel) to look at issues.								
FUTURE ITEMS														
Update on Public Realm / Green Market / Bandstand Mark Walshe					✓	Update on the proposed city centre orientation improvements (including signage and car park renaming).				✓				

ENVIRONMENT AND ECONOMY OVERVIEW AND SCRUTINY PANEL WORK PROGRAMME 2016/17

Appendix 1

Issue Contact Officer	Type of Scrutiny					Comments/status	Meeting Dates							
	Performance Management	Key decision Item/Referred from Executive	Policy Review/Development	Scrutiny of Partnership/ External Agency	Monitoring		30 Jun 16	28 Jul 16	15 Sep 16	27 Oct 16	1 Dec 16	19 Jan 17	2 Mar 17	20 Apr 17
Local Enterprise Partnership Jane Meek				✓		Update on LEP projects including the Enterprise Zone, Carlisle station and Citadel *Growth Fund 3 Bid **Annual Update				✓ *		✓ **		
Performance Monitoring Reports Gary Oliver	✓					Monitoring of performance relevant to the remit of Panel	✓		✓		✓		✓	
Budget Peter Mason		✓	✓			To consider budget proposals for 2016/17					✓			
Business Support Task and Finish Group Steven O'Keeffe						Review progress of recommendations made by the T&F group				✓				
Update on Clean Carlisle Colin Bowley	✓				✓	6 monthly updates				✓				✓
Tourist Information Centre					✓	Update on business plan development and performance monitoring of the TIC				?				

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Tourism Draft Plan						Development of plan to promote tourism				?				
Local Plan / Local Development Scheme						Consider emerging work programme (including Community Infrastructure Levy – CIL)			✓					
Nuclear New Builds														
Car Parking Darren Crossley						Update of car parking developments and strategy going forward.				✓				
Carlisle Economic Potential												✓		
Carlisle South Masterplan Garry Legg														✓
Economic Strategy Jane Meek													✓	

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Business Plan development for Carlisle Parks Phil Gray						Progress of Talkin Tarn Business Plan and possible Business Plan development of other Parks			✓				✓	
Skills Action Plan						To coincide with Carlisle Skills Fair								
COMPLETED ITEMS														
Discretionary Rate Relief Policy Peter Mason		✓				Consultation regarding discretionary rate relief for difficult to let commercial properties	✓							

A.3

Environment Agency

Working with the Cumbria Floods Partnership

Reducing flood risk from source to sea

First steps toward an integrated catchment plan for Cumbria

Foreword

The floods in Cumbria were truly terrible. They were horrendous in their extent: three complete river systems – the Eden, the Derwent and the Kent – flooded simultaneously.

They were horrendous in their intensity – we now know that the Eden experienced the highest flow levels, recorded on any river in England; following the highest day of rainfall recorded. They were horrendous in their human impact – one and a half thousand homes flooded in Kendal alone; a similar number in Carlisle, and hundreds in Appleby, Keswick and Cockermouth – and, while the media attention was on the larger areas, dozens of outlying villages were suffering terribly. A hundred bridges were damaged some – like Pooley Bridge – which had stood for more than a hundred years were swept away; others – like Eamont Bridge – which had stood for six hundred years were undermined. The slopes of Helvellyn collapsed, spilling rubble into the river, and flooding Glenridding, three times in a week – and on the other side, destroying the A591.

In recognition of these terrible events the Secretary of State appointed me, as Minister for Flooding, to establish and chair this Cumbria Floods Partnership. Our first responsibility as a government was the emergency response to protect lives. We owe a huge thanks to mountain and bay rescue teams, police, military, councils, churches, volunteers, the Environment Agency, and dozens more organisations – and particularly to the communities themselves – for responding so calmly and professionally to something so extreme and unprecedented.

The second stage has been recovery. Collectively the government has spent over £150 million to support recovery in Cumbria, over the last six months. This has extended from emergency funds for households, and businesses, to repairing Cumbrian roads and bridges allowing, among many other projects, Eamont Bridge to be reopened, and Pooley Bridge to be replaced, and the A591 to be rebuilt.

The third stage is now to prepare Cumbria for flooding in the future. I'm pleased that we have been able to provide affordable flood insurance for households across Cumbria through FloodRe. We must also make individual homes more resilient, so we have provided a £5,000 grant for every flooded home, to protect that home better in the future.

I have asked the Environment Agency to appoint a Director for each main river catchment - one for the Eden, one for the Derwent, and one for the Kent and Leven. This document records their initial work to make communities safer for this winter, from repairing damaged flood defences, to building new defences, and establishing new warning areas. But this is just the beginning.

Now the most important task is to improve our flood defences for the long-term. So I have asked the Catchment Directors, as their next task, to re-examine the river systems in Cumbria, from the source to the sea, and to make sure that the money we spend on the environment, farming, and water supply continues to contribute to flood protection, rather than ignoring it. The plans will rely on state-of- the-art engineering, and scientific modelling of water movement. But it will also rely on listening to communities, and farmers – who live alongside these rivers, know the most detailed local problems, and have seen the behaviour of the rivers at first hand.

By the time these plans are completed, we should be able to analyse all the ways in which you can control a flood - holding water back on the hills, through tree-planting and bogs; working closely with water companies (to use their reservoirs), and with farmers in their fields. In some places we may have to slow the water down, through weirs, and in other places – such as under bridges – we will have to speed it up through dredging. We have to connect all these actions ultimately to individual houses, flood walls, and pumping systems.

And finally, we have to fund all this work. So we have already allocated up to £72 million to invest in flood defence across Cumbria. This is a considerable sum of money.

We owe an enormous thanks to Cumbrian communities for their resilience through this terrible period. I would like to add my thanks to all the partners who have worked so hard and so patiently with the Environment Agency to bring these plans together, which will be vital over the coming years for our businesses, for our homes, and our families.

Rory Stewart OBE MP
June 2016

Cumbria better prepared for winter – about this plan

Flooding is devastating. The 6,300 householders and businesses across Cumbria flooded in December 2015 have spent much of the last 6 months dealing with its effects.

The Environment Agency and our partners have worked hard, and continue to do so, to repair damaged infrastructure and help ensure Cumbria is better protected and prepared for the coming winter, and for the future.

Since December 2015, we have:

- Secured an additional £58 million, including up to £25 million for Carlisle.
- Inspected over 3,300 raised defences and repaired 75% of the 159 flood defences damaged by Storm Desmond. All will be repaired by autumn 2016.
- Completed new flood protection schemes in Appleby, Keswick and Threlkeld on the Gategill Beck.
- Started the construction of flood protection schemes in Kendal, Ulverston, Braithwaite, Ennerdale Bridge, Keswick, Maryport and Egremont.
- Created 7 new flood warning areas taking the total to 72 areas and providing warnings to over 6,500 properties across Cumbria.
- Improved 91 drains, rebuilt 7 walls, repaired 3 bridges and used 2,500 tonnes of concrete to rebuild and resurface 44,000 square metres of the A591 (Highways England).

By winter 2016, with our partners we will:

- Remove 70,000 tonnes of gravel and debris from local rivers in communities such as Glenridding and Kendal.
- Spend over £1 million to make sure that our existing flood defences are well-maintained and are fit for purpose, including over 50km of walls and embankments across Cumbria.
- Make available national supplies of up to 250 water pumps, 500,000 additional sand bags and additional temporary defences.
- Establish a network for the 48 flood action groups so that they can better help communities to prepare, respond and recover. Create a further 6 new flood warning areas to provide better warning to communities – taking the total to 78 in Cumbria.
- Hold a flood risk modelling competition to kick-start changes to the way we manage and plan for water.

Looking further ahead we will work together to:

- Invest a total of up to £72 million in Cumbria to provide better protection from flooding to at least 4,300 homes by 2021.
- Restore 350 hectares of peatland to hold water upstream for longer at several sites in the headwaters of the Eden, Derwent and Kent and Leven catchments.
- Make changes to the way that United Utilities operates its Thirlmere reservoir to provide flood protection without compromising the security of water supply for its customers.
- Work with 4 small communities to test what integrated flood and land management looks like in practice.
- Implement measures to slow the flow where feasible, including woody debris dams and floodplain storage upstream of Gamblesby, Cumrew and Stockdalewath in the Eden catchment, and channel meandering on the Whit Beck in the Derwent catchment.
- All Local Planning Authorities in Cumbria will update key spatial planning documents in light of learning from Storm Desmond to ensure that new development is safe and resilient by summer 2017.

You can find a comprehensive list of actions online by visiting www.gov.uk and searching for ‘Cumbria Flood Action Plan’. We will also produce a series of Community Action Tables; some are already available on the same web page.

As well as the actions in the 3 catchments most severely impacted by Storm Desmond, the government continues to invest in flood resilience and water management across the whole county. Over £11.6 million of government funding has been allocated to projects over the next 5 years in Ulverston, Dalton-in-Furness, Barrow-in-Furness, Whitehaven, Ennerdale and Egremont to better protect over 1,600 homes.

Cumbria better prepared – timeline of action

December 2015

Storm Desmond.

Wettest calendar month on record.

Record rainfall hits Cumbria resulting in record river levels and devastating flooding.

2016

January

First meeting of the Cumbria Floods Partnership.

Flood defence repairs started.

30,000 tonnes of gravel and debris removed.

February

Catchment Directors appointed.

100% of assets inspected.

9% of flood defence repairs complete.

New flood gates installed in Appleby.

March

An additional £58 million for flood defences announced.

Work on Ulverston flood protection scheme started.

Temporary bridge at Pooley Bridge opened.

April

33% of flood defence repairs complete.

Further 25,000 tonnes of gravel and debris removed.

7 new flood warning areas went live.

Appleby flood defence scheme completed.

Work started on new flood defence wall at Glenridding.

May

A591 repaired and reopened.

Grasmere flood recovery repairs completed.

Keswick flood defence repairs started.

June

Create a network for the 48 flood action groups.

Elliot Park flood protection scheme for Keswick complete.

July

Flood risk management and modelling competition launched.

75% of flood defence repairs complete.

August

United Utilities confirm scope and timing of changes to operation of Thirlmere reservoir.

Work on Ennerdale Bridge flood protection scheme starts.

September

Further 25,000 tonnes of gravel and debris removed bringing the total to 70,000 tonnes.

National supplies of more pumps, sand bags and temporary defences available.

October

All flood defence repairs complete and ready for the winter.

Gategill Beck, Threlkheld scheme complete.

November

Publish interactive version of the Cumbria Flood Action Plan.

Confirmation of how up to £25 million on new flood defences in Carlisle will be spent.

December

Cumbria will be operationally prepared for winter.

January 2017 and beyond

Invest a total of £72 million to better protect at least 4,300 homes by 2021.

Implement ‘slow the flow’ projects across Cumbria.

Take an integrated catchment approach to water management.

Cumbria better prepared – a summary of actions

In order to respond to the enormity of the flooding, we are taking a comprehensive and detailed approach to protecting Cumbria with more than 100 separate actions. We have grouped these into 5 themes:

Strengthening Defences

We took immediate action to repair and strengthen infrastructure, such as flood defences, roads, bridges, water and sewage works, so that they are operational for the winter and can reduce the impact as flood water travels through towns and villages. We have constructed over 30 new flood defence projects in communities such as Carlisle, Kendal, Ulverston, Pooley Bridge, Braithwaite and Grasmere. By the winter, we will also have more mobile flood defences and portable pumps available for use in Cumbria.

We will continue to work with partners and review the flood risk of roads, railways, water and power supplies that are locally critical, and we will take action to protect them. We are also looking at the role played by bridges to see what we can do to reduce flood risk and plan to replace Staveley Bridge with a single span bridge. We will take coordinated action on the flood management of reservoirs, water courses and drains with United Utilities and other local partners.

Upstream Management

We are working with farmers, landowners, communities and organisations, such as United Utilities and The Rivers Trust to identify how to use and manage the landscape to slow the flow of water and reduce peak river levels. We will use land-management techniques such as soil aeration, bunds, leaky dams, woodland creation and river restoration to absorb water and slow the flow in locations across Cumbria including Whit Beck, Kentmere, River Gowan and Longsleddale.

We are restoring at least 350 hectares of high priority peatland to absorb water upstream of communities, and we are creating natural flood storage areas upstream of Gamblesby, Cumrew and Stockdalewath. Agri-environmental schemes will help support flood management, and we are exploring the opportunities for upstream engineered water storage. United Utilities is currently reviewing the operation of existing reservoirs such as Thirlmere and Birds Park to manage flood flows.

We are piloting this integrated approach to flood and land management in specific sub-catchments in Patterdale, Glenridding, Stockdalewath, Braithwaite and Staveley. We will share what we find out from these pilots with farmers, landowners and communities across Cumbria, and the lessons we learn will help us in our work in the rest of England.

Maintenance

The Environment Agency is updating its routine maintenance activities in light of Storm Desmond. Along with partners, we have repaired and maintained flood defences, rivers, bridges, roads and other infrastructure, so that they remain in good working order and can hold as much flood water as possible. We have repaired over 150 damaged flood and coastal defences and pumping stations. Damaged highways and bridges have been repaired and reopened, and across the Lake District National Park footpaths have been restored.

United Utilities have made sure that reservoirs and water treatment works returned to full operation, and we removed over 70,000 tonnes of gravel and debris from local rivers and streams. We will remove the further build-up of gravel in Kendal, Carlisle and Workington. We are also making it easier for communities to find out what maintenance we are planning to do and supporting local communities to carry out their own maintenance work.

Resilience

We are ensuring that people and property are as prepared for and resilient to flooding as possible and that action is taken beforehand so that life can get back to normal as quickly as possible after a flood. We will establish a network for community flood action groups to share learning and ideas, and local flood action groups are recruiting more flood volunteers, particularly those who live outside flood risk areas. We are also working with children and young people affected.

Multi-agency flood plans are ready for the winter, and we have provided support and grants to make homes and businesses more prepared and resilient. Warning is essential, and we are providing more flood warnings to over 6,500 properties across Cumbria as well as using new methods to warn communities in areas where river levels rise quickly. Local authorities are updating local spatial plans so that inappropriate development can be avoided. The insurance sector are also trialling a new approach to the availability of business insurance in flood risk areas.

Water Level Management Boards

Water Level Management Boards are locally run, public bodies that manage areas of special drainage need. They manage water levels for the benefit of the local economy, environment and the community. We continue to develop proposals and consult on the setting up of new Water Level Management Boards in the Lyth Valley and Waver Wampool.

Cumbria better protected and prepared – investment

In the immediate aftermath of Storm Desmond and the December 2015 floods, the Secretary of State announced the formation of the Cumbria Floods Partnership, and government agreed to invest more money in flood risk management across Cumbria.

We have worked with partners to ensure that we spend this money where it can add the most benefit to the preparedness and protection of the communities of Cumbria. This will pave the way for a new approach to protecting homes, businesses, and the local economy against flooding. The evidence from Cumbria County Council's flood investigation reports will be used to identify where additional investment may be required in the future.

Government and partners have committed:

- A total of up to £72 million of government funding allocated to Cumbria to better protect at least 4,300 homes from flooding by 2021. Up to £58 million of this is new funding agreed since December 2015. This includes:
  - £4.7 million of government funding for projects within the Derwent catchment to better protect at least 525 homes in Flimby, Maryport, Braithwaite and Keswick. Projects totalling £1.15 million were completed in March 2016 at Threlkeld and Elliot Park, Keswick.
  - £6.5 million of government funding for projects in the Eden catchment to better protect at least 503 homes in Appleby, Eamont Bridge, Wigton, Pooley Bridge, Rickerby Park and Gamblesby.
  - Up to £25 million for projects in Carlisle. We will confirm how this will be spent by November 2016.
  - £24.3 million of government funding for projects in the Kent and Leven catchments to better protect at least 1,217 homes in Grasmere, Grange-over-Sands and Kendal.
- Over £11.6 million of government funding has also been allocated to projects over the next 5 years in Ulverston, Dalton-in-Furness, Barrow-in-Furness, Whitehaven and Egremont to better protect over 1,600 homes.
- To help Cumbria's households and businesses recover from the December floods, government has provided a total of over £150 million. This includes:
  - £9.7 million of government funding is being invested in 159 recovery projects to be complete by autumn 2016 including repairs to walls, embankments, pumping stations, gauges, removal of large trees and over 70,000 tonnes of gravel and checking the safety of 1,600 bridges.
  - £117 million of government funding has been allocated to Cumbria County Council for investment in critical highways and bridges.
  - £10 million has been invested in repairing and improving the A591.
  - £20.6 million for Cumbria County Council to distribute through its Community and Business Recovery Scheme, as payments to flooded households, businesses and resilience measures in flooded properties.
  - £5.5 million for district councils in Cumbria to provide council tax and business rate relief for flooded properties.
  - £3 million government investment to repair and improve pathways within the Lake District National Park and £500,000 for paths in Cumbria outside the National Park.
- Cumbria County Council is investing £3.5 million from capital reserves for repairs across the county to ensure that communities remain connected.
- There have been over £10 million in charitable donations to the Cumbria Community Foundation's flood recovery appeal to support people and families in hardship and vital community organisations. This includes £4.7 million funding from government.

Catchment management in Cumbria – long-term vision

In the future, we will increasingly work at a catchment scale to integrate land management, development and resilience in areas at risk, from the tops of the fells down to the coast.

Achieving this will require:

Catchment-level leadership: we have trialled new ways of working with Catchment Directors leading engagement with partners and communities.

Next steps: we will now consider how to evolve these roles to support innovation and coordinate planning not just across water and flood risk, but also forestry, land management, biodiversity and other functions.

A strong evidence base: we have commissioned research to understand the impact of soil condition on run-off and worked with partners to pinpoint locations for measures to slow the flow, such as tree planting.

Next steps: we have launched a hydrological modelling competition for the Eden to generate more sophisticated river modelling and kick-start changes to how we manage and plan for water. The competition will support development of an interactive tool to bring the actions in this plan to life.

Collaborative working: working collaboratively allows us all to understand others' views, experiences and expertise, and to collate local knowledge. It will help us to make more informed decisions about what is right for Cumbria and to deal with issues such as what integrated land management means in practice, and who has the authority to take decisions.

Next steps: we will work in partnership to co-produce solutions – beginning with the 4 pilot areas – to deliver innovative solutions and understand long-term governance needs.

Cumbria Floods Partnership – working together for a better prepared Cumbria

This document has focused on the actions we and partners have taken over the last 6 months since the storms of December 2015. Many were about recovering damaged infrastructure. They were complemented by communities and organisations implementing their own actions. Together, these actions will make sure that Cumbria is better prepared and protected against flooding for winter 2016 to 2017 and beyond.

At the same time we have formed the Cumbria Floods Partnership. This has created a framework for communities, public, private and third sector organisations to work together. It has focused on doing more with the money that is invested by doing things differently. Its aim is to work collaboratively to create one vision through shared meetings, shared ownership and joint planning. Its initial work has focused primarily on the 3 most affected catchments – the Derwent, the Eden and the Kent and Leven. The Cumbria Floods Partnership is looking, for the first time, at how we manage flood risk across the length of these river catchments, rather than looking at communities in isolation.

It is early days for the Cumbria Floods Partnership. The catchment actions on pages 9 to 11 represent the first step towards developing a plan to reduce risk and improve resilience. Its aim is to form an action plan that inspires communities, and all involved in flood risk management, to work together and combine their knowledge and resources to reduce flood risk along river catchments from source to sea.

The way in which the Cumbria Floods Partnership works will be crucial to its success. It wants to encourage:

1 Collaborative working – working together to share information, coordinate funding and provide communities with a single point of contact.

2 Catchment approach – improving what we know about river catchments and taking actions that manage risk from source to sea.

3 Integrated solutions – ensuring that actions reduce flood risk but also deliver wider benefits for people and wildlife.

4 Community-focussed decision-making – sharing information and data with communities, groups and organisations so they can help us to best protect our communities from flooding.

5 Evolution and learning – using learning from Storm Desmond and the best information available to work closely with communities and identify actions.

It will trial this approach in 4 pilot areas: Stockdalewath, Patterdale and Glenridding, Staveley and Braithwaite. Organisations such as the Environment Agency and The Rivers Trusts will trial community-led projects to reduce local flood risk.

Across Cumbria there are 48 flood action groups bringing together communities and organisations to make sure they are better protected and prepared for flooding. By June 2016, the Cumbria Floods Partnership will form a network for these flood action groups so they can support one another, share best practice and help communities better respond to, and recover from flooding. The Cumbria Floods Partnership will also help to identify single points of contact into the various organisations who can work with them.

Initial key actions across the Eden catchment

Strengthening defences

1. Up to £25 million for new flood defences and flood storage in and upstream of Carlisle. Full business case completed by September 2017.
2. £6.5 million of investment allocated to Appleby, Eamont Bridge, Wigton, Pooley Bridge, Rickerby Park and Gamblesby providing protection to over 500 homes.

Upstream management

3. Hold a flood risk modelling competition by autumn 2016 to encourage development of integrated solutions to managing risk from source to sea.
4. Install woody debris dams, reduce soil compactions and identify locations for additional storage of floodwater upstream of the villages of Gamblesby, Cumrew and Stockdalewath.
5. Complete planting of trees in ghylls and wet areas at Mallerstang, upstream of Appleby.
6. Launch community-led flood and land management pilot projects in Patterdale, Glenridding and Stockdalewath by summer of 2016.
7. Scope an investigation by end of July 2016 into using Haweswater and Wet Sleddale reservoirs to reduce flooding downstream.

Maintenance

8. Remove gravel and debris in Carlisle by the end of August 2016.

Resilience

9. Carlisle City Council and local flood action groups to develop a Carlisle flood plan.
10. Produce a strategic flood risk assessment for the development area of Carlisle South by early 2017.

Water Level Management Boards

11. Continue work to develop proposals and re-consult on a new Waver Wampool WLMB by spring 2017.

Initial key actions across the Derwent catchment

Strengthening defences

1. £4.6 million of investment allocated to increase flood protection in Flimby, Maryport, Braithwaite and Keswick.
2. Complete the works at Penrith Road in Keswick by March 2020 and review the Keswick and Cockermouth flood investigation reports to help identify any additional new needs.

Upstream management

3. Make changes to the way United Utilities operates its Thirlmere reservoir to provide flood protection without compromising the security of supply for its customers.
4. Restore rivers and floodplains above Cockermouth and Workington to slow the flow by 2021.
5. Modify the channel on Whit Beck to slow the flow by 2017.
6. Launch community-led flood and land management pilot project in Braithwaite by summer 2016.

Maintenance

7. Remove build-up of gravel from the Derwent in Workington and Cockermouth by the end of September.

Resilience

8. Long-term options for the Gote Road area of Cockermouth developed by Allerdale District Council.
9. Update the Allerdale Strategic Flood Risk Assessment by summer 2017.

Initial key actions across the Kent and Leven catchment

Town

River

Lake/Reservior

Strengthening defences

1. £24.3 million of investment in Kendal, Burneside, Staveley and Carrus Green.
2. Replace bridge at Staveley with a single span bridge by June 2017.
3. Review the effect of bridges on flooding in Kendal, Ambleside and Backbarrow.

Upstream management

4. Develop proposals for river and peat restoration to slow the flow in the Kentmere, River Gowan, Longsleddale, River Mint and River Sprint catchments by summer 2017.
5. Investigate the use of redundant Birds Park reservoir to reduce flood risk downstream in Kendal by March 2017.
6. Launch community-led flood and land management pilot project in Staveley by summer 2016.

Maintenance

7. Remove further gravel in Kendal by autumn 2016.
8. Improve understanding of impact of water levels in Windermere and the operation of sluices at Newby Bridge by autumn 2016.

Resilience

9. Develop the Kendal town centre development masterplan by November 2016.
10. Work with children and young people affected by flooding to help them cope and build resilience by winter 2017.

Water Level Management Boards

11. Continue work to develop proposals and re-consult on a new Lyth Valley WLMB by spring 2017.

Next steps – for the plan

This plan is our first response to the December 2015 floods. It sets out the key actions that we have taken and intend to take to prepare for next winter and reduce flood risk across the 3 catchments most affected: the Eden, Derwent, and Kent and Leven.

The Cumbria Flood Action Plan is a living document. We want to continue working with local partners and communities to develop it further, including an interactive version in the autumn. This will also provide an opportunity for an update on progress. We need you, your community and your organisation to help us do this by providing specific, localised information on catchment management and taking actions to make homes, communities and businesses more resilient to flooding.

Here are 3 key things you can do now:

1. Sign up for flood warnings – call Floodline on 0345 988 1188 or log on to www.gov.uk/flood
2. Make your home more resilient to flooding – advice is available via www.gov.uk/flood
3. Share your local knowledge, suggestions and ideas for catchment management with Cumbria Floods Partnership at CumbriaFloodsPartner@environment-agency.gov.uk

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Working with the Cumbria Floods Partnership

Cumbria flood action plan

LIT- 10473

Version 1 June 2016

Introduction

Flooding is devastating. The 6,300 householders and businesses across Cumbria flooded in December have spent much of the last 6 months dealing with its effects. The Environment Agency and its partners have and continue to work hard to repair damaged infrastructure and help ensure Cumbria is better protected and prepared for the coming winter and for the future. At the same time we have formed the Cumbria Floods Partnership. This has created a framework for communities, public, private and third sector organisations to work together. It has focussed on doing more with the money that is invested by doing things differently.

This document, the Cumbria flood action plan is the first step to developing an action plan covering the Eden, Derwent and Kent and Leven catchments. It provides an overview of on-going work, new actions, information and evidence gathered since December 2015. The Environment Agency, working with the Cumbria Floods Partnership and communities across Cumbria, has collated the action plan. We have held meetings and workshops to identify actions, understand priorities and bring together the most up-to-date information and evidence.

While this action plan focuses on the 3 catchments most severely impacted by the December 2015 storms, investment in flood resilience and water management continues to be made across the whole of Cumbria. Alongside the initial short term actions, we also include longer-term actions to reduce flood risk and manage water in the future.

The plan comprises three parts:

- A short document that sets out what has been done since December, what further work will happen before winter and a summary of the actions from this document.
- The full action plan - this document - which details all of the actions identified so far that will manage flood risk in the three catchments most severely impacted by the December 2015 storms and the actions which will be taken across the whole of Cumbria.
- A series of community action tables, which provide a more detailed overview of the actions planned in specific flood risk areas. We will continue to develop these through the summer until we have produced one for each of the communities flooded in December 2015.

All these documents can be viewed online by going to www.gov.uk and searching for ‘Cumbria flood action plan’.

The Cumbria flood action plan is a living document. We want to continue working with local partners and communities to develop it further, including an interactive version, in the autumn. This will also provide an opportunity for us to update on progress. We need you, your community and your organisation to help us do this by providing specific, localised information on catchment management and taking actions to make homes, communities and businesses more resilient to flooding. This first edition of the plan reflects the ideas and requests from the people of Cumbria. If you have further ideas and actions that you feel should be included in the development of the plan, please let us know by emailing CumbriaFloodsPartner@environment-agency.gov.uk

During the development of the plan we will continue to look at ways to reduce flood risk and to protect and improve the environment. [1]

[1] The Environmental Assessment of Plans and Programmes Regulations 2004 (SEA) regulations do not apply to this plan, as it does not fall under the definition of ‘plans and programmes’. However, we will ensure an appropriate level of environmental assessment will be undertaken for any actions where there is potential to damage the environment. Some actions will require further investigation and assessment under specific legislation, for example Habitats Regulations Assessment (HRA). The need for HRAs will be determined on a project by project basis.

The content of the Cumbria flood action plan

The actions within the plan are divided into four sections:

Section	Actions
Cumbria-wide actions	**1 to 65**
Eden catchment actions	**66 to 79**
Derwent catchment actions	**80 to 91**
Kent and Leven catchment actions	**92 to 102**

The actions within the plan are divided into five themes:

Strengthening defences
This is about constructing and strengthening infrastructure such as flood defences, roads, bridges, water and sewage works to reduce the impact as flood water travels through towns and villages. This includes improving walls, embankments and bridge arches to keep flood water in the channel.

Upstream management
This is about working with farmers, landowners and organisations, such as United Utilities and the Rivers Trusts, to identify how to use and manage the landscape to slow the flow of water. Actions include temporarily storing water in lakes and reservoirs or on farmland, planting trees or changing the way farmland is managed so it absorbs more water.

Maintenance
This is about repairing and maintaining flood defences, rivers, bridges, roads and other infrastructure so they remain in good working order and can hold as much flood water as possible. This includes maintaining pumps, managing gravel where it increases flood risk and removing debris from important locations and around structures.

Resilience
This is about ensuring people and property are as resilient as possible to flooding, and take actions ahead of time to help life get back to normal as quickly as possible after a flood. It includes people signing up to flood warnings, developing a personal or community action plan or making alterations to their home or business so flood water causes less damage.

Water Level Management Boards (WLMBs)
WLMBs are locally run, public bodies that manage areas of special drainage need. They manage water levels for the benefit of the local economy, environment and the community.

Cumbria-wide								
Strengthening defences – to improve flood defences, roads, bridges and other infrastructure we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
1		Assess the vulnerability of key infrastructure* to future flooding events, and take action to reduce the risk. * Roads, railways, power supplies, water supplies, telecommunications, gas, sewage treatment works and bridges.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Autumn 2016	Short-term	Risk management authorities, operating authorities and asset owners	
2		Review the role that bridges play in flood risk and their vulnerability during a flood. Where bridges act to increase flood risk seek funding to reduce this risk.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Assess by September 2016	Short-term	Cumbria County Council and the Environment Agency	
3		Identify where we can best protect communities by extending the use of additional national mobile flood defences ready for winter 2016.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Autumn 2016	Short-term	Environment Agency	Community and Local Resilience Forum
4		Extend the review of provision of temporary flood barriers to all water supply assets serving more than 5,000 people.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	December 2017	Short-term	United Utilities	
5		Work with Defra and WaterUK to provide temporary flood barriers for all treatment works at risk of flooding and serving more than 25,000 people. Liaise with suppliers to design and procure the most appropriate schemes.	Reduce flood risk to communities.	Cornhow waste treatment works, Ennerdale waste treatment works, Castle Carrock waste treatment works	December 2016	Short-term	United Utilities	
6		Identify where we can best protect communities by extending the use of 250 national mobile pumps before/during flood incidents.	Resilience – reduce impact and improve recovery time from flooding.	Throughout Cumbria	Autumn 2016	Short-term	Environment Agency	Community and Local Resilience Forum
7		Share modelling and performance data to better understand links between rivers and sewerage systems, and develop common ways of managing flooding.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Autumn 2016	Short-term	United Utilities	Cumbria Flood Risk Strategic Partnership

Cumbria-wide								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
8		Identify further land management opportunities and locations for natural flood management projects by working with landowners, commoners, and the farming communities to use their knowledge of the catchments. These will include; soil aeration, bunds, leaky dams, woodland creation, woodland management and river restoration.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Short-list of options by October 2016	Short-term	Environment Agency and Cumbria County Council as lead local flood authority	Forestry Commission, Natural England, Lake District National Park, National Farmers Union, Farmers Network, Countryside Landowners Association, National Trust, Rivers Trusts and environmental non-governmental organisations
9		Identify 3 sub-catchments for intensive natural flood management development. Use these to test a range of approaches and improve the evidence needed future for expansion across Cumbria.	Flood risk reduction actions provide environmental benefits.	Upstream of communities at risk of flooding	Sub-catchment work begins September 2016	Short-term	Environment Agency and Cumbria County Council as lead local flood authority	Forestry Commission, Natural England, Lake District National Park, National Farmers Union, Farmers Network, Countryside Landowners Association, National Trust, Rivers Trusts and environmental non-governmental organisations
10		Identify locations where woodland creation and changes in woodland management will reduce flood risk.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	End of July 2016	Short-term	Forestry Commission Forest Services and the Environment Agency	United Utilities, National Trust and other owners of woodland holdings
11		Identify target areas where woodland creation and changes in woodland management could reduce flood risk within the four pilot catchments of Stockdalewath, Patterdale and Glenridding, Staveley and Braithwaite.	Best practice - improving the way we share knowledge and experience to benefit all.	Four pilot locations	June 2016 - December 2016	Short-term	Forestry Commission	Environment Agency, Natural England, community action groups and parishes

Cumbria-wide								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
12		Undertake projects such as weir removal, re-meandering channels and re-connecting rivers to the natural flood plain across Cumbria beyond 2016 as part of the Cumbrian River Restoration Strategy.	Flood risk reduction actions provide environmental benefits.	All catchments	2021	Short to medium	Environment Agency and Natural England	South Cumbria Rivers Trust, West Cumbria Rivers Trust, Eden Rivers Trust, National Trust, RSPB
13		Survey six high-priority peatland sites and secure funding to restore 350 hectares of peatland to hold water upstream for longer.	Flood risk reduction actions provide environmental benefits.	Eden, Derwent and Kent and Leven Catchment	Survey sites - by September 2016 Secure funding - by December 2020	Short-term Medium-term	Cumbria Wildlife Trust (Cumbria Peat Partnership)	Farmers, landowners and land managers
14		Apply the learning from the European LIFE Integrated Project to enable all issues on a river catchment to be considered collectively.	Flood risk reduction actions provide environmental benefits.	Derwent, South Cumbria and Eden	2016 (for the NFM modelling tool) 2025 overall	Long	Environment Agency (DEFRA)	United Utilities, Natural England, Rivers Trust and Local Rivers Trusts as affiliates of the Rivers Trust
15		Increase the uptake of natural flood management measures through schemes such as Countryside Stewardship and Catchment Sensitive Farming as part of an integrated approach to managing catchment.	Flood risk reduction actions provide environmental benefits.	Throughout Cumbria	Tbc	Medium-term	Natural England and Forestry Commission	Farmers, landowners and land managers
16		Update Catchment Sensitive Farming proposals (including new Farm Advice Framework contracts) to include natural flood management advice.	Flood risk reduction actions provide environmental benefits.	Throughout Cumbria	January 2017	Short-term	Natural England	Farmers, landowners and land managers
17		Run a bidding round for the Countryside Stewardship facilitation fund, targeted at flood risk areas. This will build on existing farmer engagement and encourage farmer collaboration with natural flood risk management measures.	Flood risk reduction actions provide environmental benefits.	Throughout Cumbria	January 2017	Short-term	Natural England	Farmers, landowners and land managers

Cumbria-wide								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
18		Review understanding of surface water management across the county to ensure appropriate actions and investments.	Reduce flood risk to communities.	Throughout Cumbria	Winter 2016	Short-term	Cumbria County Council	District councils, United Utilities
19		Identify further locations for building flood storage basins and/or improving storage of flood water upstream of communities.	Reduce flood risk to communities.	Throughout Cumbria	Begin identification Autumn 2016	Short-term	Environment Agency, Lead local flood authority, Natural England, farmers, landowners, land managers, Cumbrian Rivers Trusts and Wildlife Trust	Planning authorities, universities, Natural England
20		Use the Regional Flood and Coastal Committee Slow the Flow project to work with a range of partners to enable the development of natural flood management schemes across the Eden, Derwent and Leven and Kent catchments.	Flood risk reduction actions provide environmental benefits.	Throughout Cumbria	2020	Short - Medium	North West Regional Flood and Coastal Committee	Cumbria Wildlife Trust, Environment Agency, Natural England, Forestry Commission, Rivers Trusts and other environmental NGOs
21		Maintain and repair upland footpaths to reduce erosion and sediment and surface water runoff, improve visual impacts and biodiversity.	Environmental - flood risk reduction actions provide environmental benefits.	All catchments in the Lake District National Park	10+ years	Long-term	National Trust, Lake District National Park Authority	Friends of the Lake District, Nurture Lakeland, Cumbria County Council
22		Promote the Charter for Collaborative Actions on Natural Flood Management (instigated by the Foundation for Common Land and the Federation of Cumbrian Commoners) and follow its principles of collaborative working in the creation of upstream management.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	October 2016	Short-term	Cumbria Floods Partnership	Environment Agency, Forestry Commission, Natural England and Lake District National Park, Lead local flood authority, National Farmers Union, Countryside Landowners Association, the National Trust, Rivers Trusts and other environmental NGOs

Cumbria-wide								
Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
23		Repair the 159 flood defences, embankments, gauging stations, pumping stations and other assets damaged by Storm Desmond.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Autumn 2016	Short-term	Environment Agency and other Risk Management Authorities	
24		Repair bridges and highways damaged by Storm Desmond.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Programme published Summer 2016 Repairs complete May 2017	Short-term	Cumbria County Council	United Utilities, Lake District National Park authority
25		Repair footpaths and footbridges damaged by Storm Desmond.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	2019	Short-term	Lake District National Park authority and Cumbria County Council	
26		Inspect, repair and return to full operation all company assets damaged by Storm Desmond such as reservoirs, culverts and treatment works.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	June 2017	Short-term	United Utilities	
27		Improve the published maintenance programme to make it easier for communities to find out what and where maintenance is planned.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	April 2017	Short-term	Environment Agency	
28		Support local communities, landowners / occupiers to carry out maintenance works legally.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Ongoing	Short-term	Cumbria Floods Partnership and Cumbria Flood Risk Strategic Partnership	
29		Identify further options for improving the flow of water at bridge crossings and pinch points, including reviewing gravel removal where appropriate. Assess the environmental impact of any gravel removal.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	March 2017	Short-term	Environment Agency	Cumbria County Council, District Councils

Cumbria-wide								
Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
30		Remove 70,000 tonnes of gravel and debris deposited by winter storms from local rivers and streams.	Reduce flood risk to communities.	Throughout Cumbria	September 2016	Short-term	Environment Agency	
31		Make changes to how we maintain rivers and flood defences based on a better understanding of the dramatic changes in geography and landslips that occurred during Storm Desmond. Assess the impacts on the environment of any maintenance changes we make.	Reduce flood risk to communities.	Throughout Cumbria	April 2017	Short-term	Environment Agency	Cumbria Flood Partnership

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
32		Establish a network for community flood action groups and community action groups across the county so they can better help communities prepare, respond and recover.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	June 2016	Short-term	Community Resilience Network (subgroup of Cumbria Local Resilience Forum)	Flood action groups/ community action groups
33		Meet with the community and flood action group network once a year to assess how effectively and efficiently the emergency response agencies and communities are working together.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Summer 2017	Short-term	Community Resilience Network (subgroup of Cumbria Local Resilience Forum)	Flood action groups/ community action groups
34		Recruit more flood action group or community action group volunteers who live outside the areas at risk of flooding.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Ongoing	Ongoing	Community Resilience Network (subgroup of Cumbria Local Resilience Forum)	Flood action groups/ community action groups
35		Develop multi agency flood plans to ensure organisations and local communities are ready for Winter 2016.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Autumn 2016	Short-term	Cumbria Flood Risk Strategic Partnership Cumbria County Council, district authorities, Environment Agency	Flood action groups/ community action groups

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
36		Update strategic flood risk assessments (local councils' documents which represent their understanding of flood risk across their district) by using the latest knowledge and data following Storm Desmond.	Reduce flood risk to communities	Throughout Cumbria	Summer 2017	Short-term	Planning authorities; Cumbria County Council, Carlisle City Council, Eden District Council, South Lakeland District Council, Copeland Borough Council, Allerdale Borough Council, Lake District National Park, Yorkshire Dales National Park	Environment Agency and lead local flood authority
37		Update long term spatial plans (which are used to decide where housing and other building works can take place) in response to Storm Desmond.	Reduce flood risk to communities	Allerdale local plan site allocations	Winter 2017	Medium-term	Allerdale Borough Council	Neighbouring local planning authorities and statutory consultees
				Barrow local plan	Summer 2017	Medium-term	Barrow Borough Council	
				Copeland Local plan site allocations and policies	Spring 2018	Medium-term	Copeland Borough Council	
				Eden local plan in examination at the moment, with no land allocations for development in areas at risk of flooding	Review by 2021	Long-term	Eden District Council	

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
				Carlisle South, major mixed use development	Evidence gathering ongoing with first consultation in early 2017	Medium-term	Carlisle City Council	
				Lake District National Park authority	October 2018	Medium-term	Lake District National Park	
				South Lakeland Local plan part 3 – Development management policies Kendal town centre development masterplan	December 2017 Consultation November 2016	Short-term	South Lakeland District Council, Lake District National Park	
38		Learn from other areas of the country that have faced significant risk of flooding or erosion. Learn what action they took and apply that in Cumbria in an ambitious way that suits the scale of the problem.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Summer 2017	Medium-term	Planning authorities	Communities, Environment Agency, Town and Country Planning Association, Landscape Foundation, Royal Town Planning Institute, Royal Society of Architects
39		Organise a seminar for local planning authorities to improve knowledge and implementation of planning measures to reduce flood risk.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	July - September 2016	Short-term	Cumbria Planners Training Service and Town and Country Planning Association	

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
40		Conduct a research project: "Planning for Climate Change in Local Plans". Working with selected Local Authorities to review Local Plans in terms of Climate Change legislation and Flood Risk measures.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	June - December 2016	Short-term	Joseph Rowntree Foundation and Town and Country Planning Association	
41		Promote the uptake of property level resilience grants available to householders and businesses affected by the 2015 floods.	Resilience – reduce impact and improve recovery time from flooding.	Throughout Cumbria	December 2016	Short-term	District councils, Allerdale, South Lakeland, Eden and Carlisle	People who were flooded in December 2015. Defra, Department for Communities and Local Government (DCLG) and third sector organisations including Business Emergency Resilience Group (part of the Princes Trust for Businesses in the Community)
42		Understand the needs of businesses across Cumbria in terms of preparedness and resilience and investigate possible mitigation measures.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Ongoing	Short-term	Lake District National Park Partnership Business Task Force Subgroup including Local Economic Partnership (LEP), district and county council and business representatives	
43		Work with children and young people affected by flooding to help them cope and to engage them in the building resilience. Head Start and the Suitcase project (Lancaster University).	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Winter 2017	Short-term	Lancaster University and Save the Children	

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
44		Implement appropriate agreed improvement actions from Cumbria Local Resilience Forum debrief (both acute and recovery phases).	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Actions available July 2016	Short-term	Cumbria County Council	
45		Investigate the use of existing environmental monitoring technology in improving flood warnings for communities, particularly where the Environment Agency cannot currently provide conventional flood warnings. Trial any potential systems in catchments that respond rapidly to rain.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	December 2016	Short-term	Risk management authorities reporting to Cumbria Strategic Floods Partnership	
46		Increase, by 4% every year, the number of people at risk of flooding who are signed up to our flood warning service so they can take action to prevent harm to themselves and their property.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Ongoing	Short-term	Environment Agency	
47		Improve and expand the flood warning service so it is integrated across response authorities providing a seamless, robust service to the public and businesses so they receive the kind of advance warning they need to take effective action to prepare for flooding.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	2020	Medium-term	Environment Agency	
48		Promote the new flood warning areas in Kendal, Wigton, Windermere and River Leven at Newby Bridge and Backbarrow and River Roe at Stockdalewath and those being planned for Ulverston and Dalton in Furness so they can help provide better warning to communities.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	April 2016 Expansion by April 2017	Short-term	Environment Agency	
49		Trail expanding the availability of business insurance for businesses most affected by flooding.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Summer 2017	Short-term	British Insurance Brokers' Association (BIBA)	

Cumbria-wide								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
50		Make improvements to the incident training and capability of people and equipment across the county, including the creation of Major Incident Plans - NW Coastal Flooding Plan being the first.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	October 2016	Short-term	Environment Agency	
51		Promote slowing the flow of water into the drains by using sustainable drainage. (Sustainable drainage systems are methods that builders can use when developing new sites).	Best practice – improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	December 2016	Short-term	Cumbria County Council as lead local flood authority	Planning authorities; Carlisle City Council, Eden District Council, South Lakeland District Council, Copeland Borough Council, Allerdale Borough Council, Lake District National Park, Yorkshire Dales National Park, Environment Agency
52		Investigate the loss of telecommunications during Storm Desmond. Work with those communities to protect services or establish a contingency plan in the event of future flooding.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	June 2017	Short-term	Tele-communications industry, risk management authorities reporting to Cumbria Strategic Floods Partnership	
53		Increase the number of communities, individuals and families that have an Emergency Plan in place and develop an evaluation tool that can be used to measure the effectiveness of Community Emergency Plans.	Resilience - reduce impact and improve recovery time from flooding.	Throughout Cumbria	Ongoing with evaluation tool available from October 2016	Short Term	Community Resilience Network (subgroup of Cumbria Local Resilience Forum)	

Cumbria-wide								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
54	All	Use data from Storm Desmond to test, improve and expand the computer flood risk modelling used to inform flood warnings, flood risk mapping and flood alleviation scheme design standards.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	December 2016	Short-term	Environment Agency	Cumbria County Council, United Utilities, Highways England, District councils
55	All	Using latest science of rainfall, hydrology and climate change where appropriate to update models and inform decisions on flood risk management.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Ongoing	Short-term	Cumbria Flood Risk Strategic Partnership and Cumbria Flood Partnership	Academics, Met Office
56	All	Carry out aerial surveys of main river catchments, to assess geographical changes including landslip. Make the information available for others to use. Interpret the results in combination with partners including Natural England to identify, understand and mitigate the risks.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	The information from the aerial surveys should be available in August 2016.	Short-term	Environment Agency	Forestry Commission and Natural England
57	All	Run a series of webinars to increase understanding of how rivers work, the risk of flooding people face, what to do to prepare for a flood, what to do if it floods, and what we are doing to reduce the risk.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Winter 2016	Short-term	Cumbria Floods Partnership	Cumbria Flood Risk Strategic Partnership
58	All	Understand more about the risk of flooding in disadvantaged areas and share learning across Cumbria.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	October 2016	Short-term	Joseph Rowntree Foundation and Paul Sayers	Environment Agency and local authorities
59	All	Identify all potential sources of funding available to manage water and land-use and to reduce the risk of flooding. Develop guidance to explain who is responsible for funding and how it can be accessed.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Spring 2017	Short-term	Environment Agency	Cumbria Flood Risk Strategic Partnership

Cumbria-wide								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
60	All	Share the learning from the 4 pilots. (See corresponding actions, 78, 79, 91 and102).	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	June 2016 - December 2016	Short-term	Environment Agency, relevant flood action groups and local partners	Natural England, Forestry Commission, farmers, land owners, and land managers, Rivers Trusts, National Trust, Wildlife Trusts, District Councils, county council, Lake District National Park
61	All	Learn from Science Wise and others nationally and internationally (e.g. North Atlantic Programme - US Army Corp of Engineers), to improve the communication of flood risk.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Ongoing	Short-term	Environment Agency	Cumbria Floods Partnership
62	All	Review Cumbria Flood Risk Strategic Partnership's current governance.	Better partnerships - improving the ways we work and achieve action together.	Throughout Cumbria	July 2016	Short-term	Cumbria Flood Risk Strategic Partnership and Cumbria Floods Partnership.	
63	All	Update the action plan when recommendations from the flood investigation reports are published.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Summer 2017	Short-term	Environment Agency, Cumbria County Council	
64	All	Apply the Cumbria Flood Partnership approach of community led, integrated working to all other river catchments in Cumbria.	Best practice - improving the way we share knowledge and experience to benefit all.	Throughout Cumbria	Summer 2017	Short-term	Cumbria Flood Risk Strategic Partnership	

Cumbria-wide								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
65	All	Make it easier for communities and organisations to work together, for example, by holding joint meetings, sharing knowledge and agreeing decisions.	Better partnerships - improving the ways we work and achieve action together.	Throughout Cumbria	Tbc	Short-term	Cumbria Flood Risk Strategic Partnership and Cumbria Floods Partnership	Parish council; communities, Cumbria County Council, District Council, National Trust, Lake District National Park authority, Environment Agency, Natural England, Rivers Trusts, flood action groups, community action groups, Forestry Commission

Eden catchment actions								
Strengthening defences – to improve flood defences, roads, bridges and other infrastructure we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
66		Assess, design and construct projects shown in the Flood and Coastal Risk Management Investment Plan and Local Flood Risk Management Strategy.	Reduce flood risk to communities.	Appleby	Currently under investigation By March 2020	Medium-term	Lead risk management authority	Cumbria Flood Partnership
				Carlisle (post 2015 works)	Currently under investigation By March 2020	Medium-term		
				Eamont Bridge	Currently under investigation By March 2020	Medium-term		
				Rickerby Park	Currently under investigation By March 2020	Medium-term		
				Gamblesby, Carlisle.	Currently under investigation By March 2020	Medium-term		
				Goslingsike, Carlisle	Currently under investigation By March 2020	Medium-term		
				Wigton	Currently under investigation By March 2020	Medium-term		

Eden catchment actions

Strengthening defences – to improve flood defences, roads, bridges and other infrastructure we will:

	Themes	What	Why	Where	When	Time-scale	Who leads	Who supports
				Pooley Bridge	Currently under investigation By March 2020	Medium-term		
67		Assess the vulnerability of the West Coast Main Line Railway particularly at bridge crossings, and take action where appropriate.	Reduce flood risk to communities.	Carlisle	May 2017	Short-term	Network Rail	Environment Agency and Cumbria County Council as lead local flood authority

Eden catchment actions

Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:

	Themes	What	Why	Where	When	Time-scale	Who leads	Who supports
68		Review the role of Haweswater and Wet Sleddale Reservoirs in contributing to flood risk management. Understand, through modelling, the potential benefit of changing operating regimes as well as the impact on public water supply and dam safety. Work in partnership with the Environment Agency, community groups and other statutory agencies to agree actions.	Reduce flood risk to communities.	Eden catchment	Scope investigation and agree actions by August 2016	Short-term	United Utilities	Environment Agency and downstream communities
69		River restoration projects in Swindale. Realignment of channel and valley management offering natural flood risk management benefits, including 6 hectares of bankside woodland and 2 flood storage areas.	Environmental - flood risk reduction actions provide environmental benefits.	Swindale on the Lowther Catchment.	2018	Short-term	RSPB	Environment Agency, Natural England and United Utilities
70		Reduce soil compaction, install woody debris dams and identify locations for additional storage of floodwater upstream of the villages of Gamblesby, Cumrew and Stockdalewath.	Environmental - flood risk reduction actions provide environmental benefits.	Eden catchment and Roe and Ive.	Ongoing	Short-term	Eden Rivers Trust	Environment Agency and land owners
71		Plant tree in ghylls and wet areas at Mallerstang, upstream of Appleby.	Environmental - flood risk reduction actions provide environmental benefits.	Eden catchment	Ongoing	Short-term	Woodland Trust	Natural England and landowners

Eden catchment actions

Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:

	Themes	What	Why	Where	When	Time-scale	Who leads	Who supports
72		As part of a larger scheme of work looking at the flood risk and habitat benefits of weir removal, a strategic assessment of the natural flood management potential of the Caldew, Eamont and Lowther sub-catchments of the Eden will be completed in 2016.	Environmental - flood risk reduction actions provide environmental benefits.	Eden	2016	Short-term	Eden Rivers Trust	Environment Agency, Natural England, Cumbria County Council, Carlisle City Council, land owners, farming tenants, Lake District National Park Authority

Eden catchment actions

Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:

	Themes	What	Why	Where	When	Time-scale	Who leads	Who supports
73		Remove the build-up of gravel from the winter storms.	Reduce flood risk to communities.	River Caldew at Holme Head Weir in Carlisle, River Petteril at Botcherby Bridge in Carlisle	Autumn 2016	Short-term	Environment Agency	
74		Monitor and remove gravel when it reaches a defined trigger level.	Reduce flood risk to communities.	Appleby Bridge, Appleby Swimming Pool, Bampton Grange, Brougham, Carlisle Botcherby Bridge, Carlisle Holme Head Weir, Carlisle London Road Retail Park, Carlisle Nelson Bridge, Carlisle Skew Bridge, Eamont Bridge, Glenridding, Newton Reigny, Pooley Bridge, Soulby	Ongoing	Short-term	Environment Agency	

Eden catchment actions								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
75		Develop a Carlisle flood plan to ensure organisations and local communities are better prepared.	Resilience - reduce impact and improve recovery time from flooding.	Carlisle	Tbc	Short-term	Carlisle City Council	Flood action groups / community action groups

Eden catchment actions								
To better manage water levels we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
76		Extend the notice period to end of March 2017, during this time we will provide financial and technical support to the local community, landowners, environmental interest groups, beneficiaries and the Local Authority developing proposals for a new Lyth Valley Water Level Management Board. The proposals will reflect the needs of the area socially, economically and environmentally and further consultation on the revised proposals will take place in early 2017. If there is support, the notice period will be extended to June 2019 and a local funding solution to support the WLMB's operation costs will be found including a financial contribution to make any necessary repairs or improvements to assets as they are transferred to new ownership.	Better partnerships - improving the ways we work and achieve action together.	Waver Wampool	March 2017 review point Board establishment by June 2019	Short-term	Environment Agency, National Farmers Union	Waver Wampool Advisory Group, Water Level Management Project Board

Eden catchment actions								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
77	All	Hold a flood risk management and modelling competition on the Eden catchment.	Best practice - improving the way we share knowledge and experience to benefit all.	Eden catchment	September 2016	Short-term	Defra	

Eden catchment actions								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
78	All	Undertake the Patterdale and Glenridding pilot where agencies and communities are working together to reduce and manage flood risk in a way that best suits their community and catchment characteristics.	Reduce flood risk to communities.	Glenridding, Patterdale and Hartsop	Begin Summer 2016	Short-term	Patterdale parish community flood group	Lake District National Park Authority, National Trust, Cumbria County Council, Eden District Council, Environment Agency, Forestry Commission, Natural England
79	All	Undertake the Stockdalewath pilot where agencies and communities are working together to reduce and manage flood risk in a way that best suits their community and catchment characteristics.	Reduce flood risk to communities.	Stockdalewath	Begin Summer 2016	Short-term	Stockdalewath Flood Action Group, parish council	The Eden Rivers Trusts, Eden District Council, Cumbria County Council, Forestry Commission, Natural England

Derwent catchment actions								
Strengthening defences – to improve flood defences, roads, bridges and other infrastructure we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
80		Assess, design and construct projects shown in the Flood and Coastal Risk Management Investment Plan and Local Flood Risk Management Strategy.	Reduce flood risk to communities.	Flimby	Currently under investigation By March 2020	Medium-term	Lead risk management authorities	
				Braithwaite	Construction 2016/2017	Short-term	Lead risk management authorities	
				Penrith Road, Keswick	Construction 2017/2018	Medium-term	Lead risk management authorities	
				Maryport	By March 2020	Short-term	Lead risk management authorities	

Derwent catchment actions								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
81		Modify the Whit Beck channel to slow the flow, create new floodplain and woodland habitat and links to existing habitat.	Environmental - flood risk reduction actions provide environmental benefits.	Whit Beck Lorton valley	2017	Short-term	West Cumbria Rivers Trust	Environment Agency, Natural England, Catchment Sensitive Farming, Woodland Trust, National Trust, Aberystwyth University
82		Reconnect water courses to the flood plain and re-meander channels at locations above Cockermouth and Workington to slow the flow.	Environmental - flood risk reduction actions provide environmental benefits.	Derwent catchment	2021	Long-term	Environment Agency, Natural England and West Cumbria Rivers Trust	

Derwent catchment actions								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
83		Review the role of Thirlmere Reservoir in contributing to flood risk management. Understand, through modelling, the potential benefit of changing operating regimes as well as the impact on public water supply and dam safety. Work in partnership with the Environment Agency, community groups and other statutory agencies to balance the risks and opportunities associated with any changes and recommend a proposed way forward.	Reduce flood risk to communities.	Derwent catchment, Keswick and communities downstream	Scope investigation and agree actions by August 2016 Modelling: summer 2017 Agreement of operating changes to operating regime Summer 2019	Short- and medium-term	United Utilities	Keswick Flood Action Group and Environment Agency
84		Through the River Cocker Crag End Farm Floodplain Re-connection Project remove flood embankments to improve connectivity of river to 20 hectares of floodplain and increase natural flood storage capacity. Add to the flood management benefits by planting of willow crops.	Environmental - flood risk reduction actions provide environmental benefits.	Derwent	2017	Short-medium	West Cumbria Rivers Trust	Environment Agency, Natural England, Iggesund
85		Restore land and watercourses at Eycott Hill to contribute towards managing river flows in the River Glendermakin.	Environmental - flood risk reduction actions provide environmental benefits.	Derwent	Tbc	Short-term	Cumbria Wildlife Trust	
86		Undertake a study of river restoration options in the Borrowdale Valley including re-meandering watercourses and flood plain reconnection. Part of the ‘Catchments in Trust' approach for sustainable catchment management in the Borrowdale.	Environmental - flood risk reduction actions provide environmental benefits.	Derwent	2016	Short-term	The National Trust	Natural England

Derwent catchment actions								
Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
87		Remove build-up of gravel from the winter storms.	Reduce flood risk to communities.	Town Field in Keswick, upstream and downstream of Gote Bridge in Cockermouth, Coledale Beck in Braithwaite, Halls Beck at Bassenthwaite , River Derwent at Workington	Autumn 2016	Short-term	Environment Agency	
88		Monitor and remove gravel when it reaches a defined trigger level.	Reduce flood risk to communities.	Braithwaite Gravel Trap, Braithwaite Village, Cockermouth Cocker, Cockermouth Derwent, Coupland Beck, River Derwent at Grange, River Derwent at Workington, River Ellen at Baggrow, Halls Beck, Bassenthwaite , Keswick, Low Lorton, Egremont, Whit Beck, Lorton	Ongoing	Short-term	Environment Agency	

Derwent catchment actions								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
89		Consider long-term development options for the area of Cockermouth around the Gote Road. To reduce risk to existing housing and implement the recommendations from the flood investigation report.	Reduce flood risk to communities.	Cockermouth	Tbc	Medium-term	Allerdale Borough Council	Community, residence and Environment Agency

Derwent catchment actions								
To better manage water levels we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
90		Explore inclusion of the Black Dub sub-catchment within the Waver Wampool Water Level Management Board proposals.	Better partnerships - improving the ways we work and achieve action together.	North of Allonby	December 2016	Short-term	NFU and CLA with landowners	

Derwent catchment actions								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
91	All	Undertake the Braithwaite Pilot where agencies and communities are working together to reduce and manage flood risk in a way that best suits their community and catchment characteristics.	Reduce flood risk to communities.	Newlands Beck, Coldale, Whinlatter and Braithwaite Bog.	June 2016 - December 2016	Short-term	Parish council, Above Derwent Flood Action Group	Environment Agency, Natural England, West Cumbria Rivers Trust, National Trust, Forestry Commission, Lake District National Park and other partners

Kent and Leven catchment actions								
Strengthening defences – to improve flood defences, roads, bridges and other infrastructure we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
92		Assess, design and construct projects shown in the FCRM Investment Plan and Local Flood Risk Management Strategy.	Reduce flood risk to communities.	Kendal Burneside Staveley	Currently under investigation By March 2020	Medium-term	Lead risk management authorities	
				Kendal Carrus Green	Construction 2016/2017	Short-term	Lead risk management authorities	
				Grasmere	Currently under investigation By March 2020	Medium-term	Lead risk management authorities	
				Grange-over-Sands	Currently under investigation April 2019	Medium-term	Lead risk management authorities	

Kent and Leven catchment actions								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
93		Develop a range of measures to ‘slow the flow’, reduce erosion and improve water quality in Kentmere, River Gowan, Longsleden, River Mint and River Sprint.	Environmental - flood risk reduction actions provide environmental benefits.	East Kendal including Sandylands	summer 2017	Short-term	South Lakeland District Council, United Utilities Cumbria County Council and the Environment Agency	
94		Investigate the use of the redundant Birds Park Reservoir and adjacent land to slow the flow of water into one of the Stock Beck tributaries to the east of Kendal.	Reduce flood risk to communities.	Kendal	March 2017	Short-term	United Utilities	Environment Agency, Cumbria Wildlife Trust, South Cumbria River Trust
95		Remove embankment to reconnect the river with its floodplain, at the confluence of the River Kent and the River Gowan.	Environmental - flood risk reduction actions provide environmental benefits.	Staveley	2016	Short-term	South Cumbria Rivers Trust	Landowner, Environment Agency, Natural England

Kent and Leven catchment actions								
Upstream management – to help manage the landscape in a way that reduces impacts downstream we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
96		Continue to manage and support the sub-soiling programme on farmland around Windermere. Sub-soiling breaks up compacted layers of soil increasing water infiltration, reducing run-off and increasing crop yield.	Environmental - flood risk reduction actions provide environmental benefits.	Leven catchment	2025	Long-term	South Cumbria Rivers Trust	Landowners, Natural England - Catchment Sensitive Farming

Kent and Leven catchment actions								
Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
97		Remove build-up of gravel from the winter storms.	Reduce flood risk to communities.	Miller Bridge Aynam Road in Kendal, River Kent, upstream of Victoria Road Bridge in Kendal Stocks Ghyll in Ambleside	Autumn 2016	Short-term	Environment Agency	
98		Monitor and remove gravel when it reaches a defined trigger level.	Reduce flood risk to communities.	Yewdale Beck at Coniston, Dragley Beck at Ulverston, Grasmere, Kendal Mintsfeet Industrial Estate, Aynam Road in Kendal, Dockray Hall in Kendal, Romney Road in Kendal, Stramongate Weir in Kendal, Burneside, Spark Bridge, River Gowan at Staveley, River Kent at Staveley	Ongoing	Short-term	Environment Agency	

Kent and Leven catchment actions								
Maintenance – to keep flood defences, rivers, bridges, roads and other infrastructure in good working order we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
99		Improve understanding of the impact of water levels in Lake Windermere and the operation of sluices at Newby on the economy of South Cumbria.	Reduce flood risk to communities.	Kent and Leven	Autumn 2016	Short-term	Lake Windermere Level Group	Business Task Force, South Lakeland District Council, Environment Agency and Lake District National Park Authority

Kent and Leven catchment actions								
Resilience – to help communities and businesses get back on their feet as quickly as possible after a flood we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
100		Replace the damaged bridge at Staveley with a single span bridge.	Reduce flood risk to communities.	Staveley	June 2017	Short-term	Cumbria County Council Highways	

Kent and Leven catchment actions								
To better manage water levels we will:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
101		Extend the notice period to the end of June 2019, during this time we will provide financial and technical support to the local community, landowners, environmental interest groups, beneficiaries and the Local Authority developing proposals for a new Lyth Valley Water Level Management Board. The proposals will reflect the needs of the area socially, economically and environmentally and further consultation on the revised proposals will take place in early 2017. A local funding solution to support the WLMB's operation costs will be found including a financial contribution to make any necessary repairs or improvements to assets as they are transferred to new ownership.	Better partnerships - improving the ways we work and achieve action together.	Lyth Valley	Review point March 2017 Board establishment by June 2019	Medium-term	Environment Agency, National Farmers Union	Lyth Valley Advisory Group, Water Level Management Project Board

Kent and Leven catchment actions								
We will also:								
	Themes	**What**	**Why**	**Where**	**When**	**Time-scale**	**Who leads**	**Who supports**
102	All	Undertake the Staveley Pilot where agencies and communities are working together to reduce and manage flood risk in a way that best suits their community and catchment characteristics.	Reduce flood risk to communities	River Gowan, Kentmere and Staveley	Begin Summer 2016	Short-term	Staveley and Kentmere Parish Councils, Staveley Flood Action Group	Environment Agency, Cumbria County Council, South Lakeland District Council, Natural England, Cumbria Wildlife Trust, Lake District National Park and other partners

Cumbria flood action plan

Carlisle community action table

The purpose of this action table is to highlight the flood management that is currently in place and the specific actions that are happening or proposed within Cumbria flood action plan for this community.

Please read this table in conjunction with the full Cumbria flood action plan and summary document, which can be found online by visiting www.gov.uk and searching Cumbria flood action plan.

Catchment: **Eden**

Impact of December 2015 flood: **Approximately 1,900 homes and businesses were flooded**

Description: **The three large rivers in Carlisle are the Eden, Caldew and Petteril. Key infrastructure includes the sewage works and electricity substation which were affected by flooding and are located on Willow Holme Industrial Estate. The main west coast railway line and Cumbria's principal hospital both located nearby were also affected during Storm Desmond.**

Carlisle better protected

1) **Do now (within next 12 months):**
   - **Complete repair and recovery work**
   - **Set up temporary defences and pump deployment plan before winter 2016**
   - **Complete emergency plans**
   - **Register properties on Floodline Warnings Direct**
   - **Publish and review flood investigation report**
   - **Initiate development of flood risk management improvement works**

2) **Develop (2-5 years):**
   - **Improvements to flood risk management assets and watercourses in response to the flood investigation report.**
   - **Continue to support sharing knowledge and best practice through the network for Community Action Groups**

3) **Explore (5+ years):**
   - **Implement opportunities for natural flood risk management and engineered storage upstream of Carlisle.**

	What's already in place	What we're going to do and what this will achieve	When this work will take place	Who's responsible for this work	How much will it cost/ Sources of funding
Strengthening flood defences	Flooding in Carlisle is reduced by over 6.3km of raised embankment and 5km of flood wall. These defences work together to manage river flows through the town. There are 2 flood storage basins, two pumping stations to manage flows, 32 floodgates, 3km of culvert and numerous flap valves on drainage outfalls.	**Improved defences** £26.2million of capital funding has been allocated from within the Flood and Coastal Erosion Risk Management Investment Programme. This funding will be used to promote the options for managing flood risk which may include strengthening defences, improving the capacity of watercourses and surface water drains and upstream storage and 'slow the flow' interventions. Provide access to additional national mobile defences	Medium term (5 years) **Available before winter 2016**	Environment Agency	£26.2m from central government
		Review the recommendations from the Section 19 Flood Investigation Report and National Resilience Review to develop integrated flood risk management solutions and review maintenance practices.	Flood Investigation Report due **summer 2016**		

	What's already in place	What we're going to do and what this will achieve	When this work will take place	Who's responsible for this work	How much will it cost/ Sources of funding
		Repairing damages from Storm Desmond Work completed; Repairs to the storage basin at Durranhill and the pumping stations on the Little Caldew and Durranhill. Work ongoing and planned; In June and July projects will start to remove gravel from the river Caldew at Holme Head, repair walls at Botcherby Bridge and remove gravel and a significant number of fallen trees in the channel of the river Petteril between London Road and Melbourne Park.	Complete Short term (within 12 months)		£1.4m from central government
		Modelling and forecasting post-event model re-runs Update the river level model with the most recent flow data available from Storm Desmond to develop and support any future schemes. Hold a flood risk management and modelling competition on the Eden catchment.	Short term (within next 12 months) Short term (within next 12 months)	Environment Agency Defra	£70,000 (Cumbria wide spend)
		Understanding Bridges Review the role that bridges play in flood risk and their vulnerability during a flood	Short term – strategic review within the next 12 months	Cumbria County Council Environment Agency	
		Understanding railway structures Assess the vulnerability of the West Coast Main Line Railway particularly at bridge crossings, and take action where appropriate.	Short Term – **May 2017**	Network Rail Environment Agency and Cumbria County Council as lead local flood authority	
Upstream management 	Currently there is limited use of Upstream Management in the sub-catchments upstream of Carlisle. Projects are underway in the Eden valley to install natural flood management features and practices such as woodland planting, managing soil to improve infiltration, leaky dams and peatland restoration.	Explore opportunities for engineered and natural flood management solutions to be used upstream of Carlisle in order to 'slow the flow' and manage peak river levels	Medium term (5 years) or long term (over 5 years)	Farmers Landowners Community Groups Trusts	
		By January 2017 it will be easier for farmers and landowners to get natural flood management advice and adopt natural flood management practices through the countryside stewardship scheme.	Short term **January 2017**	Natural England	

	What's already in place	What we're going to do and what this will achieve	When this work will take place	Who's responsible for this work	How much will it cost/ Sources of funding
		The Cumbrian River Restoration Strategy aims to protect Cumbria's special areas and create better places for local communities, with reducing flood risk and adaptation to climate change being key considerations. This is achieved through projects such as weir removal, re-meandering channels and re-connecting rivers to the natural flood plain. On the River Caldew there are projects planned to work with landowners to look at gravel management, possible weir removal and re-connect parts of the river to the flood plain.	Medium term (5 years)	Eden Rivers Trust Environment Agency Cumbria County Council Carlisle City Council Land owners Natural England	
		Scope an investigation into using Haweswater and Wet Sleddale reservoirs to reduce flooding downstream.	Medium term (5 years	United Utilities	
		Natural flood management approaches will be trialled and developed in the future across the Eden catchment for affected areas, for example at Stockdalewath, Patterdale and Gamblesby. This will be part of a co-ordinated approach to develop natural flood risk management across the catchment. The longer term aim is to see how this could be scaled up for the benefit of Carlisle.	Medium term (5 years)	Farmers Landowners Community Groups Trusts	
Maintenance 	Flooding in Carlisle is reduced by over 6.3km of raised embankment and 5km of flood wall. These defences work together to manage river flows through the town. There are 2 flood storage basins, two pumping stations to manage flows, 32 floodgates, 3km of culvert and numerous flap valves on drainage outfalls. These assets and the river channel are maintained by the Environment Agency on an ongoing basis. This includes managing vegetation and removing gravel. The flood wall, embankment and other structures are also inspected and any necessary works carried out. The planned maintenance programme is available at: https://www.gov.uk/government/publications/river-and-coastal-maintenance-programme Cumbria County Council maintains the ordinary watercourses, surface water drainage and highway drainage.	New Environment Agency system will make it easier for communities to understand maintenance in their area. Improvements will show exactly when, where and what maintenance is being planned each year. Make sure that communities understand how they can access information on planned maintenance at: https://www.gov.uk/government/publications/river-and-coastal-maintenance-programme	Short (within next 12 months)	Communities Environment Agency Parish and district Councils	

	What's already in place	What we're going to do and what this will achieve	When this work will take place	Who's responsible for this work	How much will it cost/ Sources of funding
Resilience 	There are 2 active Flood Action Groups (FLAG) in Carlisle. An Emergency Plan has been completed for the Carlisle FLAG and another is currently being developed through the Willow Holme FLAG with support from the Environment Agency.	Work with the FLAG's and community groups to ensure that they are able to continue into the future. Continue to work with communities to establish a network of Emergency Groups to share learning and best practice. Carlisle City Council are producing a strategic flood risk assessment for the development area of Carlisle South.	Emergency Plan to be in place **before winter 2016.** Short term –**Early 2017**	Environment Agency (Flood Warning & Community Resilience) Communities Parish & District Councils Local Government	Local Levy, central government Flood Defence Grant in Aid
		Identify and make up a 'core' team of Carlisle City Council staff to respond in the event of flooding. Ensure available sandbags are targeted to specific areas where their use may be most effective and Carlisle City Council to agree with community groups the deployment arrangements. Carlisle City Council to continue work on developing the Carlisle Business Continuity Plan.		Carlisle City Council Carlisle City Council Carlisle City Council	
	Carlisle currently receive Flood Warnings with an uptake of 79% of at risk properties registered to the service	Work with the Emergency Group to increase uptake of residents registered to the flood warning service	**Before winter 2016 / complete**	Environment Agency (Flood Warning & Community Resilience) Communities Parish & District Councils Local Government	
		Named Carlisle City Council officer will be appointed to receive the Environment Agency/Met Office flood warnings. Carlisle City Council to develop engagement plan that will support the dissemination and gathering of information during an event. A clean-up plan is also to be developed/activated.		Carlisle City Council	
	Carlisle City Council is administering flood recovery and resilience grants	Provide additional support to DCLG and Local Authorities to improve the uptake of the £5,000 Government resilience grants to help people better protect their homes. Applications can be made up until December 2016. A further £2,000 top up grant can also be applied for from the Cumbria Flood Recovery Fund.	Closing date for Grant applications – **end of December 2016**		Resilience grants of £5k per property
		Carry out further investigations with respect to the feasibility of local temporary defences and pumping, with the aim of having plans prepared for Winter 2016. With the outcome to increase resilience in communities where either there are no formal defences in place or where additional contingency is required.	**Before winter 2016**	Environment Agency	

	What's already in place	What we're going to do and what this will achieve	When this work will take place	Who's responsible for this work	How much will it cost/ Sources of funding
Water Level Management Boards 	There are no Water Level Management Boards in this area				

June 2016 LIT 10479

Carlisle

Flood Investigation Report

Brunton Park football ground 6th December

Flood Event 5-6th December 2015

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

Version	Prepared by	Reviewed by	Approved by	Date
Working Draft for discussion with EA	Ian McCall	Michael Lilley		17th March 2016
Second Draft following EA Feedback	Ian McCall	Adam Parkes		14th April 2016
Draft for CCC review	Ian McCall	N/A		22nd April 2016
Final Draft	Ian McCall	N/A		26th April 2016
First Version	Ian McCall	Michael Lilley		3rd May 2016

Contents

Executive Summary

The flooding experienced in Carlisle on the 5th and 6th of December 2015 was unprecedented, and was the result of the effects of Storm Desmond. This storm caused a period of prolonged, intense rainfall across Northern England, falling on an already saturated catchment, and led to high river levels and flooding throughout Cumbria and beyond. The flow in the River Eden in Carlisle on the 6th of December was the highest ever recorded, resulting in flood levels in some locations that were approximately 600mm higher than those experienced during the previous record set in January 2005.

In response to the flood event, this *flood investigation report* has been completed by the Environment Agency as a key Risk Management Authority (RMA) working in partnership with Cumbria County Council as the Lead Local Flood Authority, under the duties as set out in Section 19 of the Flood and Water Management Act 2010. This report provides details on the flooding that occurred in Carlisle on the 5th and 6th of December, and has used a range of data collected from affected residents, site visits, surveys of the area, and data collected by observers and river & rainfall telemetry during the flood event. This data has been compiled by CH2M, specialist consultants in flood risk management who have provided advice in understanding the event and recommendations for future action.

The existing flood defences in Carlisle were designed to protect the city from a flooding event greater than that which was experienced in January 2005, taking into account climate change and an allowance for freeboard. The river levels experienced in December 2015 exceeded the design level of the existing defences, resulting in the extensive flooding of the City. Although defences were overtopped no defences were breached. In some locations defences were successful in reducing the damage, and delayed flooding, which gave residents additional time to prepare and reduce the impact of the flood.

Approximately 2,100 properties were directly affected by the flooding, and approximately 1,450 properties were protected by the existing flood defences, mainly in the Denton Holme area of the city.

This report details the flooding that occurred from the Rivers Eden, Petteril, and Caldew, flooding from other watercourses and from surface water. It identifies the flow routes and the causes of the flooding where flood defences were overtopped or bypassed in a number of locations in Carlisle:

- The embankments on both sides of the River Petteril upstream of Botcherby Bridge
- The left bank of the River Eden at the Sands Leisure Centre upstream of Eden Bridge and the flood defences downstream in Bitts Park
- Etterby Terrace on the right bank of the River Eden downstream of Eden Bridge
- The River Eden flood defences along Warwick Road, including Durranhill storage basin
- Caldew Maltings including Willow Holme Industrial Estate on the left bank of the River Caldew
- Defences at Carlisle sewage works from Parham Beck and the River Eden

Please note references to left and right bank are taken looking downstream with the flow of water.

Seventeen actions have been recommended in this report to manage future flood risk, which will require the involvement of a number of organisations and local communities. One of the main actions is a review of the performance of the existing Carlisle Flood Risk Management Scheme to identify what worked well, and any areas that could be improved. This review will also include potential improvements to processes such as flood warnings and gravel management. This review is already underway and is expected to be complete by July 2016.

Government is investing £3bn in flood defences in the six years to 2021 to protect the whole nation from flooding, which includes a boost of £700m announced in the last budget. Up to £25million of this funding has been earmarked to improve flood risk management in Carlisle and a further £33million has been earmarked for other Cumbrian communities.

In response to the flooding, a number of community meetings have taken place, and these will continue in order to ensure that all those affected are given the opportunity to be involved in reducing the flood risk in their area of the city.

Any additional information that residents and others can provide to the Environment Agency and Cumbria County Council to help develop our understanding of the flooding is welcomed. A lot of information has already been provided, much of which has been used to inform this report. The scale of this report means that not every piece of information can be incorporated into the document. Any additional information should be provided to;

http://www.cumbria.gov.uk/planning-environment/flooding/floodriskassessment.asp

Flooding History

Carlisle is at the confluence of three major rivers, the Rivers Eden, Caldew and Petteril, and is therefore highly prone to flooding. The city has a long history of flooding with notable floods in 1771, 1822, 1856, 1925, 1968 and more recently in 2005. The 2015 flood level on the River Eden was 0.6m higher than in 2005.

The flood event in January 2005 affected approximately 1600 properties and led to the loss of 3 lives. That event had an estimated Annual Exceedence Probability (AEP) of 0.59% (1 in 170) of flooding occurring in any one year. Much of the city's current flood defences were developed following this flood event. **They were designed to reduce the flood risk for an event with a 0.5% probability of flooding occurring in any one year.**

The annual exceedence probability (AEP) describes the likelihood of a specified flow rate (or volume of water with specified duration) being exceeded in a given year. There are several ways to express AEP as shown in Table 1. Throughout this report AEP is expressed as a percentage. As such an event having a 1 in 100 chance of occurring in any single year will be a 1% AEP event.

AEP (as percent)	AEP (as probability)	Annual recurrance interval (ARI)
50%	0.5	2-year
20%	0.2	5-year
10%	0.1	10-year
4%	0.04	25-year
2%	0.02	50-year
1%	0.01	100-year
0.1%	0.001	1000-year

Table 1 Probabilities of Exceedance

The city's defences were tested in November 2009. The flood defence scheme developed following the 2005 floods, significantly reduced the impact of this flood event .There were a small number of properties that were affected by flooding mainly in public amenity areas that are not protected by flood defences.

There was also an event in June 2012, where severe rainfall led to high river levels within Carlisle. The 2012 event was primarily on the River Caldew, whereas the 2005, 2009 and 2015 events were driven by all three rivers.

During the 2012 event, the Caldew remained within its channel and there was minimal flooding. This was partly due to the lower levels in the River Eden and also due to the flood defence scheme along the Caldew.

The 2015 event was of significantly greater magnitude than past events and the flow in the River Eden was the highest level recorded.

Table 3 shows the recorded maximum flows in the 3 rivers during these past flooding events and the numbers of properties affected.

Flooding Event	Number of Properties Flooded	Peak Flow in River Eden @Sheepmount (m^3/s)	Peak Flow in River Eden @Great Corby (m^3/s)	Peak Flow in River Caldew @Cummersdale (m^3/s)
January 2005	1600	1516.4	1372.9	252.6
November 2009	15	1029.3	815.6	175.8
December 2015	2128	**1680.0**	**1490.0**	279.0

Table 2 Recent Flood Events affecting Carlisle

Event background

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

Flooding Incident

Carlisle is the county town of Cumbria and a major city with a population of approximately 74,000[*]. The city is an economic and industrial centre for Northern England and the Scottish Borders and is also a tourist destination due to its roman heritage and nearby Lake District National Park. Due to the numerous watercourses and drainage systems within the city there are several areas at risk of flooding.

[*] From ONS (Office of National Statistics) Population estimates for UK, England and Wales, Scotland and Northern Ireland 2014

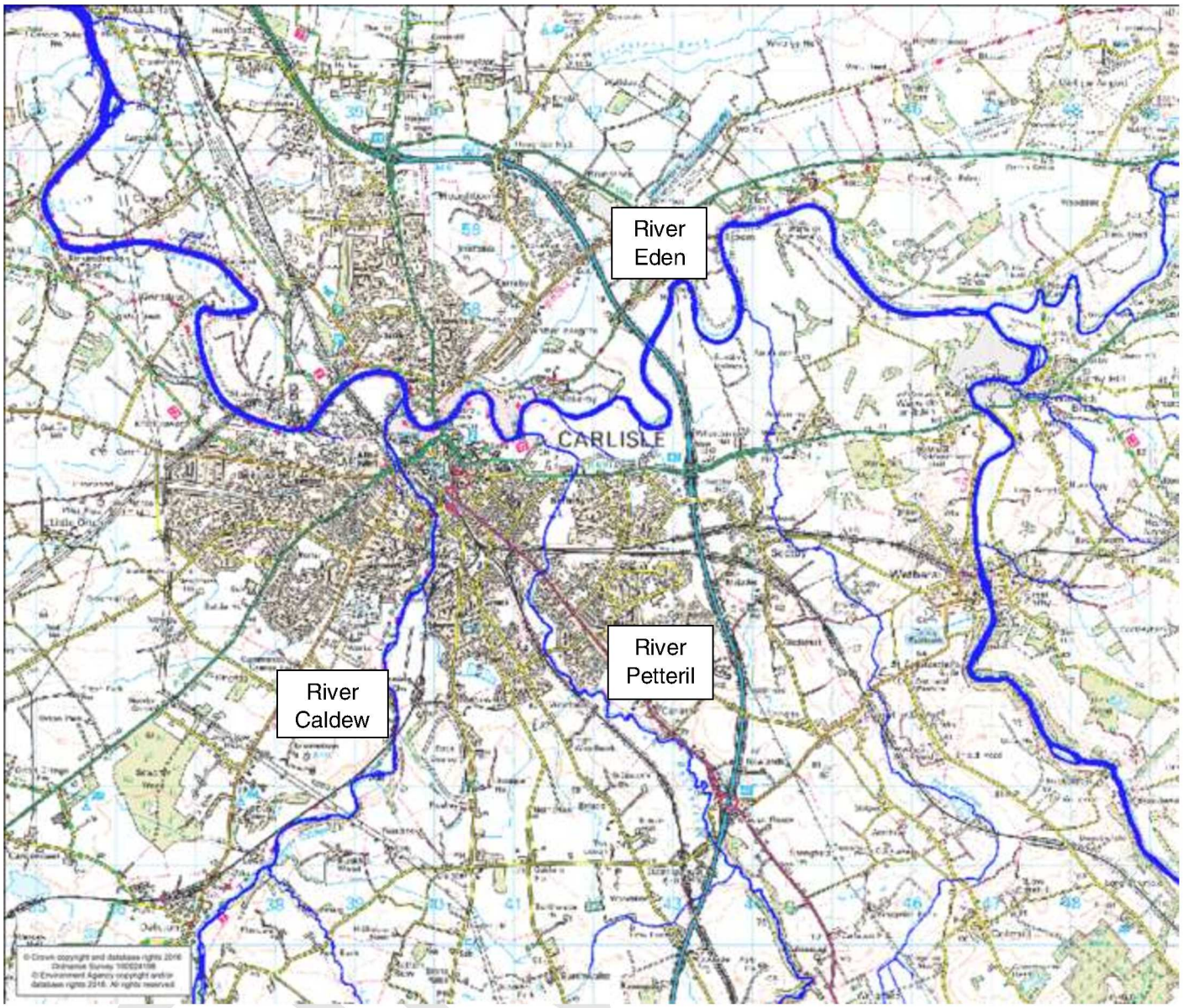


Figure 1 Location of Carlisle and Major Rivers

On 5th and 6th December 2015, approximately 2,100 properties suffered flooding. This flooding can be attributed to a record-breaking rainfall event from Storm Desmond. This led to widespread flooding from the Rivers Eden, Petteril, and Caldew, plus flooding from other watercourses, surface water and drainage systems. Figure 2 shows the approximate extent of the flooding.

Flooding was primarily associated with fluvial (river) sources and it should be noted that Carlisle lies upstream of any tidal influence on the River Eden so flood risk is not impacted by tides on the Solway Estuary.

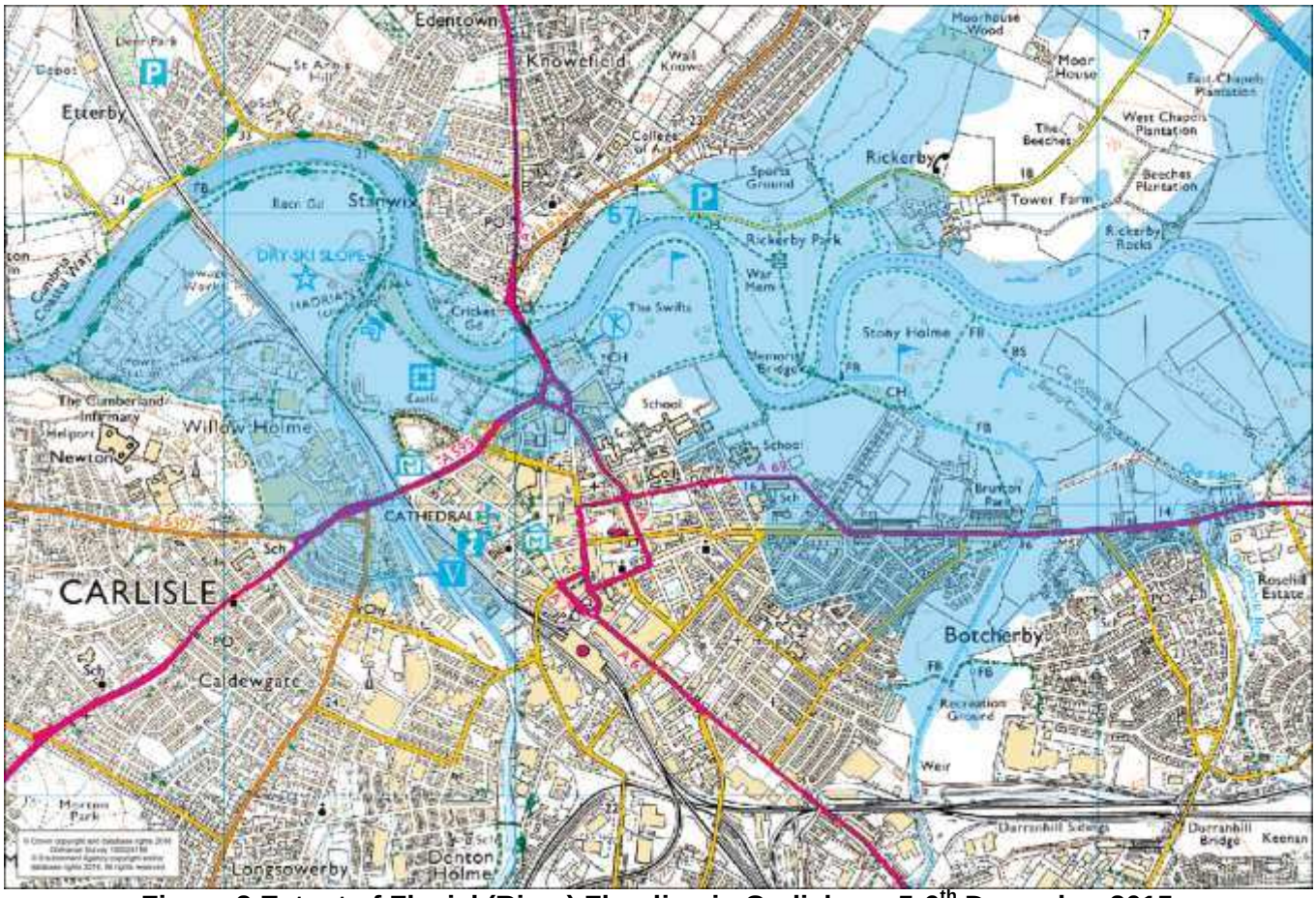


Figure 2 Extent of Fluvial (River) Flooding in Carlisle on 5-6th December 2015

For this report the flooded area has been divided into 7 sub-areas for investigation. These are shown in Figure 3.

- **Warwick Road East –** Warwick Road on the right bank of the River Petteril and surrounding area
- **Warwick Road West –** Warwick Road on the left bank of the River Petteril and surrounding area
- **Hardwick Circus –** The area south of Eden Bridge
- **Rickerby –** Rickerby village north of the River Eden
- **Etterby Terrace –** The flooded area on the right bank of the River Eden located downstream of Eden Bridge
- **Viaduct Estate –** The area on the right bank of the River Caldew around Caldew Bridge
- **Willow Holme -** The left bank of the River Caldew and the left bank of the River Eden where these two rivers meet

Please note references to left and right bank are taken looking downstream with the flow of water.

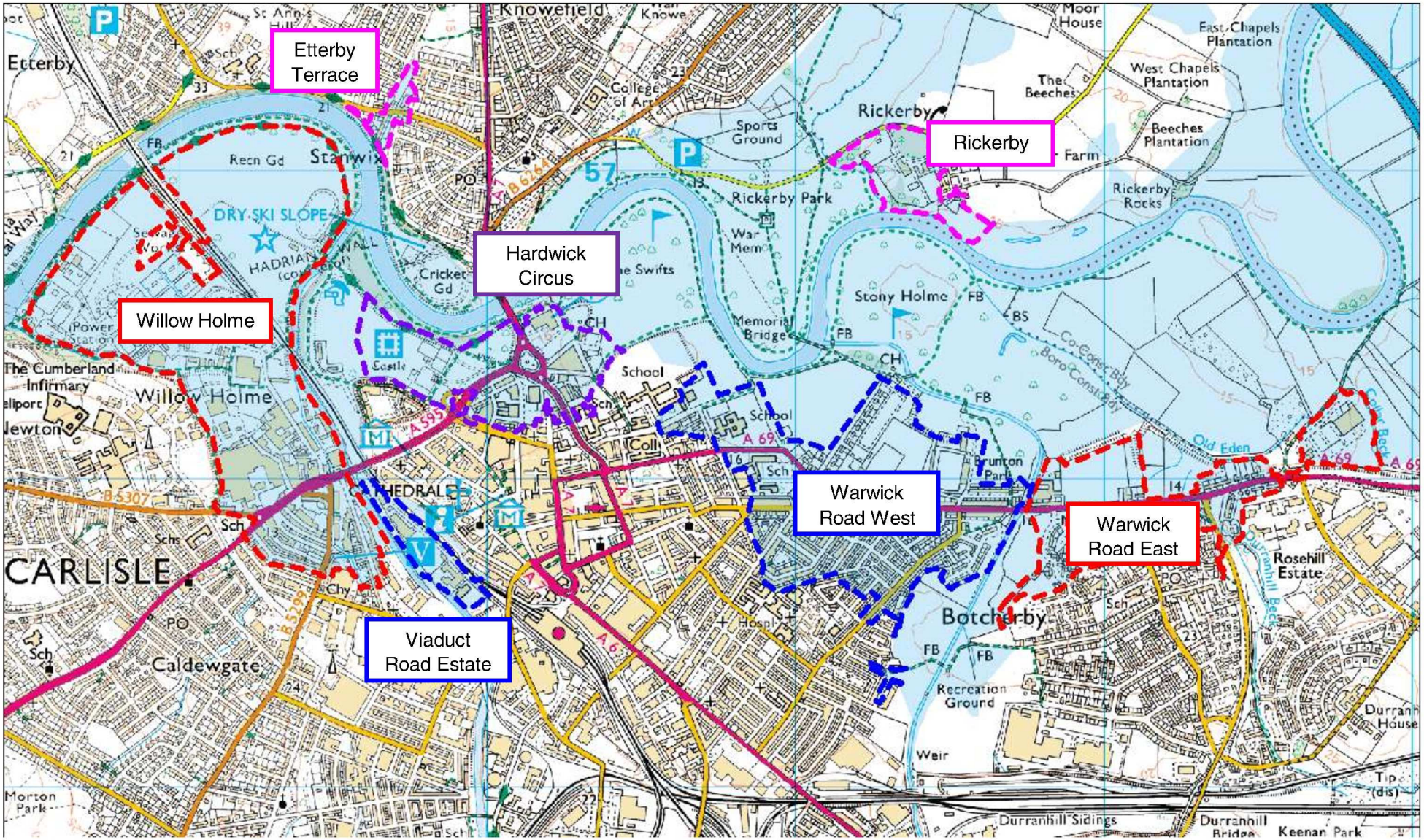


Figure 3 Identification of Areas Flooded

Current Flood Defences

Carlisle's flood defences were constructed in several phases with the majority being built following the severe flooding that occurred in January 2005. These provide protection to the city against a flood event greater than that which was experienced in January 2005. They were designed to reduce the flood risk from an event with 0.5% probability of occurring in any one year with an allowance for climate change and freeboard.

The first of these was the Eden & Petteril Flood Alleviation Scheme in the east of the city (completed in 2007) and this was followed by the Caldew & Carlisle City Flood Alleviation Scheme to the west (completed in 2010). In addition to this there are smaller schemes at Etterby Terrace and Harraby Green, which were completed before the 2009 storms.

A map of existing defences is shown in Figure 4.

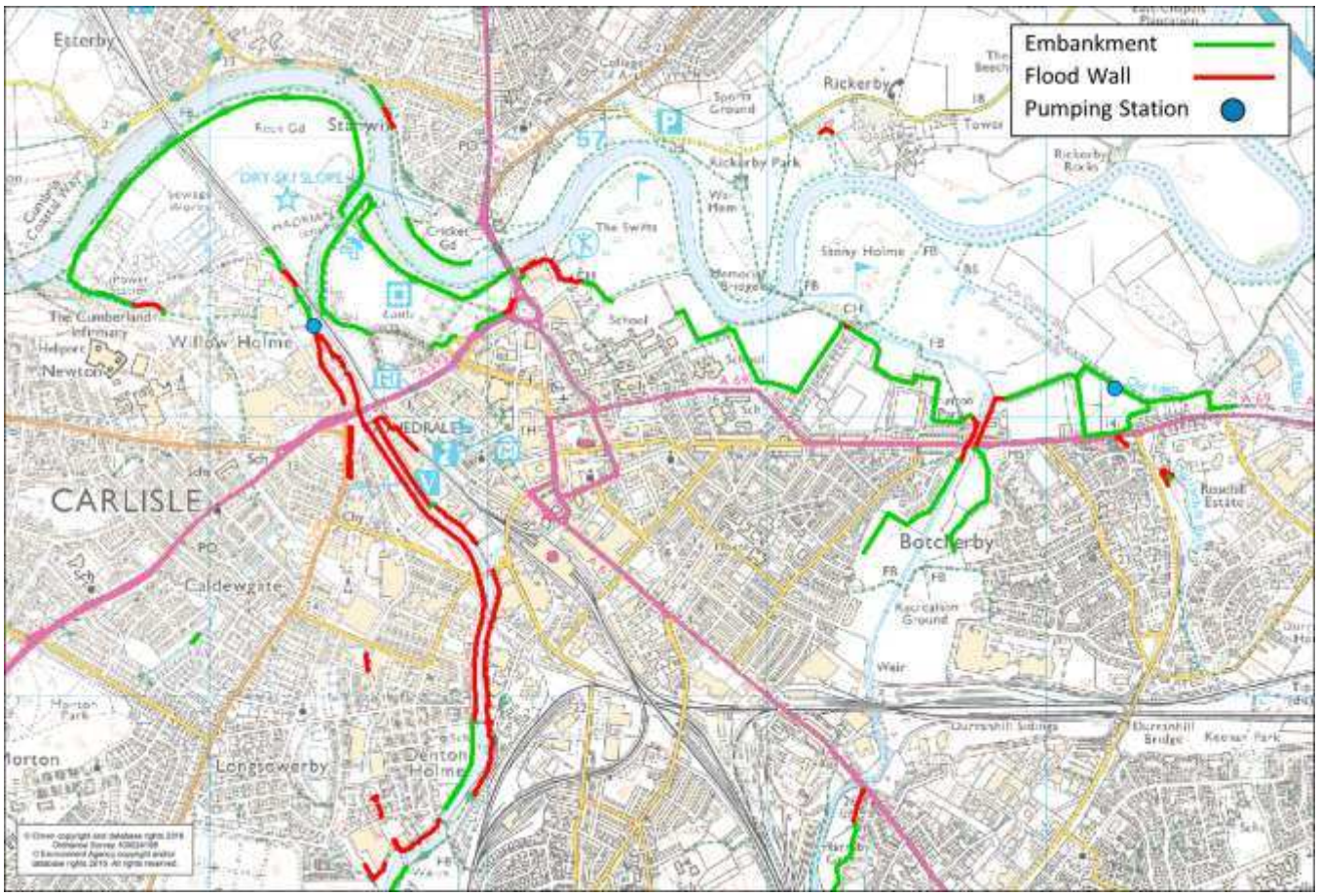


Figure 4 Flood Defences within Carlisle

Investigation

This section provides details of the rainfall event, the likely causes of flooding and the history of flooding in the area.

This investigation was carried out by the Environment Agency through surveys of the area and data collected from the communities affected with help from Cumbria County Council.

This report has been complied by CH2M from the data collected by the Environment Agency. CH2M are a global civil engineering consultancy providing a full range of flood management consultancy services in the UK and overseas. CH2M's range of experienced specialists have provided input into understanding this event and producing recommendations for future flood management in Carlisle. More details of CH2M's work in the UK is included in Appendix 5.

Rainfall Event

December 2015 was the wettest calendar month on record with much of the northern UK receiving double the average December rainfall. This also followed a particularly wet November and as such much of the soil within the Cumbria catchments was already saturated.

From the 4th to the 7th of December there was a period of prolonged, intense rainfall caused by Storm Desmond. Over this period, new 24 hour and 48 hour rainfall records were set for the UK. Both of these were within Cumbria and broke the previous records, also within Cumbria, set during the November 2009 floods.

Record breaking rainfall fell across Cumbria which caused exceptionally high river flows across the county and widespread flooding. The level of the River Eden peaked at 7.8m on the gauge at Sheepmount gauging station at 9:15am on Sunday 6th December. This was the highest river level ever recorded at this location, exceeding the previous record level of 7.2m recorded in 2005.

Table 3 shows the levels of rainfall that fell prior to the flooding event in four monitoring locations on the Eden upstream of Carlisle. These locations are shown in figure 5. The equivalent rainfall at these stations prior to the 2009 event is also shown demonstrating that the 2015 rainfall is significantly more severe. The rainfall for several of these locations has an estimated Annual Exceedance Probability of less than 0.1% (1 in 1000) and as such this level of rainfall would be expected to be extremely rare.

Location	24 hour Rainfall during November 2009 Event	24 hour Rainfall during December 2015 Event	
	mm	mm	Estimated AEP
Scalebeck	60.8	147.6	0.2% to 0.1%
Skelton	42.2	137.8	<0.1%
Brotherswater	200.8	293.4	<0.1%
Aisgil	61.2	105.7	20% to 5%

Table 3 Rainfall over 24 hours in the Eden catchment prior to the December 2015 event

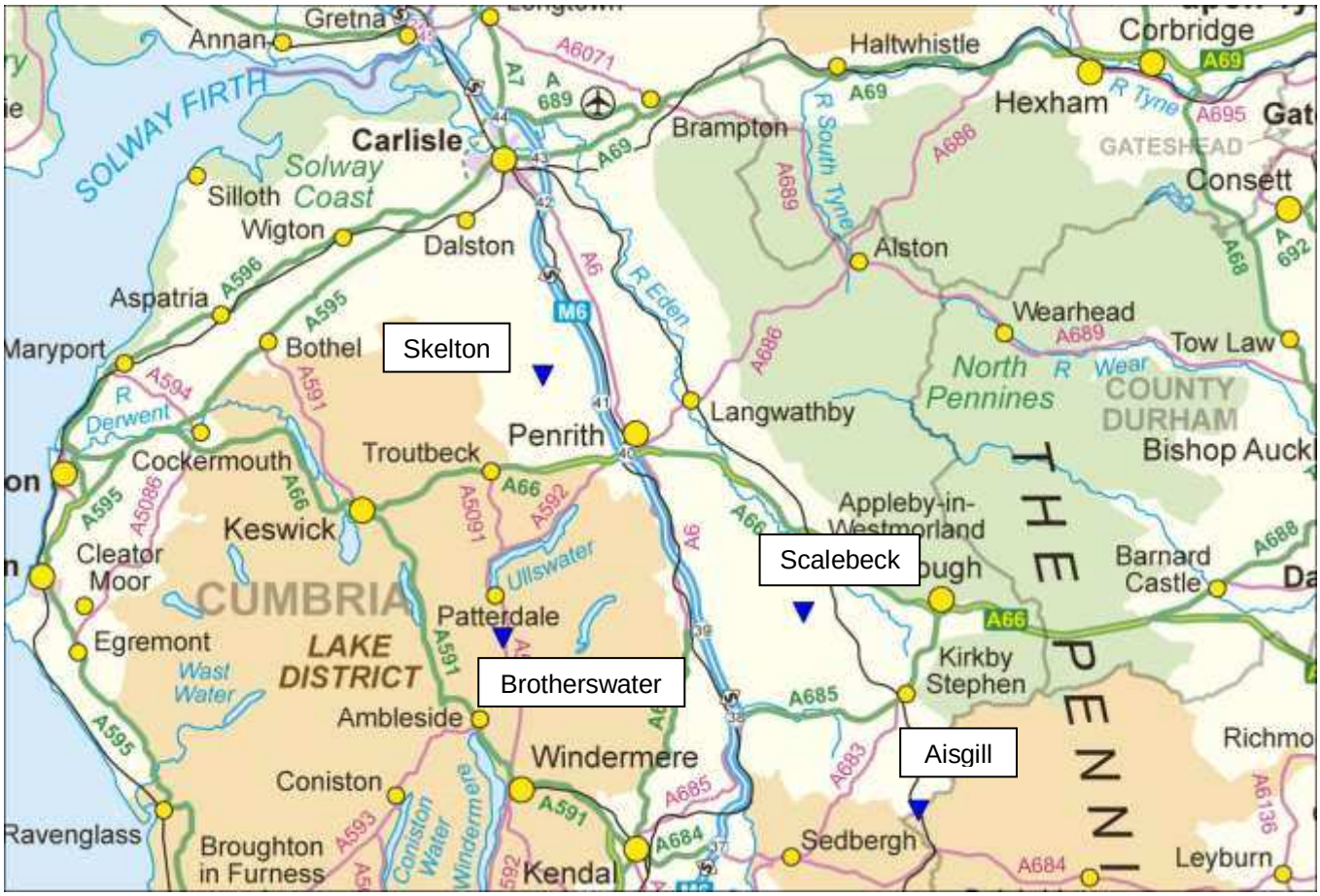


Figure 5 Location of rain gauges in the Eden catchment upstream of Carlisle

There are 4 river monitoring gauges in the Carlisle area, these are shown in Figure 6. The peak flows recorded on the Rivers Eden and Caldew are shown in Table 4, along with the flows from past flooding events.

Figure 7 shows the flow recorded by these river monitoring gauges from the 4th to the 8th of December. This shows the time and duration of the flood event on the 5th and 6th of December. This illustrates the magnitude of the flood event and the relative sizes of the three rivers.

The December 5th 2015 event has been estimated to be close to a 0.33% (1 in 300) Annual Exceedance Probability (AEP) event. An event of this magnitude therefore has a 0.33% chance of being exceeded in any year. The flow during this event was greater than any flow previously recorded on the River Eden. This is a greater magnitude event than the scheme was designed to protect against (0.5% AEP - 1 in 200). As such, river levels would be expected to be higher than the flood defence level and some overtopping of the defences would be expected to occur.

Gauging Station	River	Peak flow (m3/s)		
		Dec 2015	Past Events*	
			June 2012	Jan 2005
Great Corby	Eden	1490	N/A	1373
Cummersdale	Caldew	279	**313**	253
Sheepmount	Eden	**1680**	615	1514

Table 4 Peak Flow in River Gauges around Carlisle

* Flows for past events taken from CEH National River Flow Archive **http://nrfa.ceh.ac.uk/data/search**

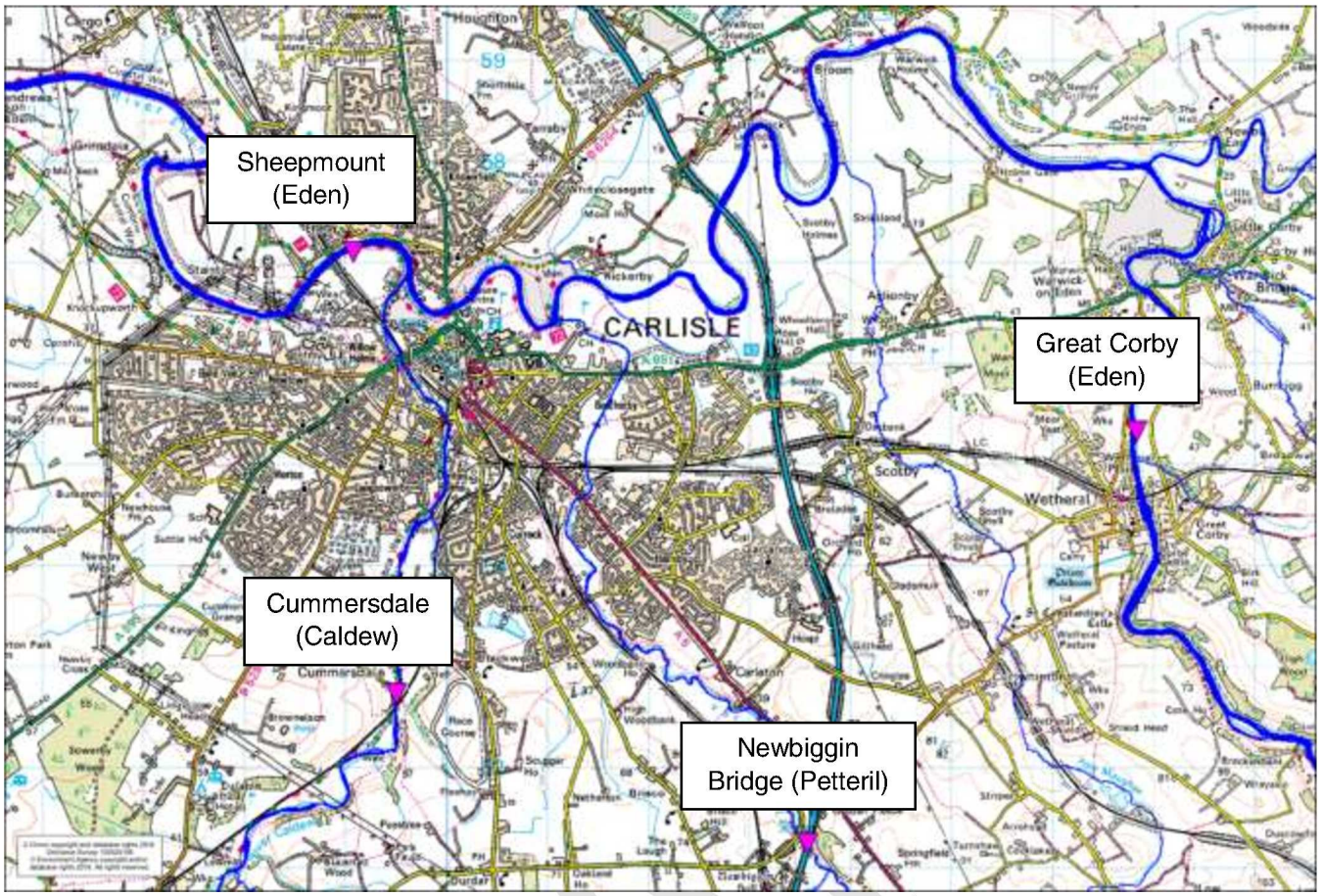


Figure 6 Location of river gauges around Carlisle

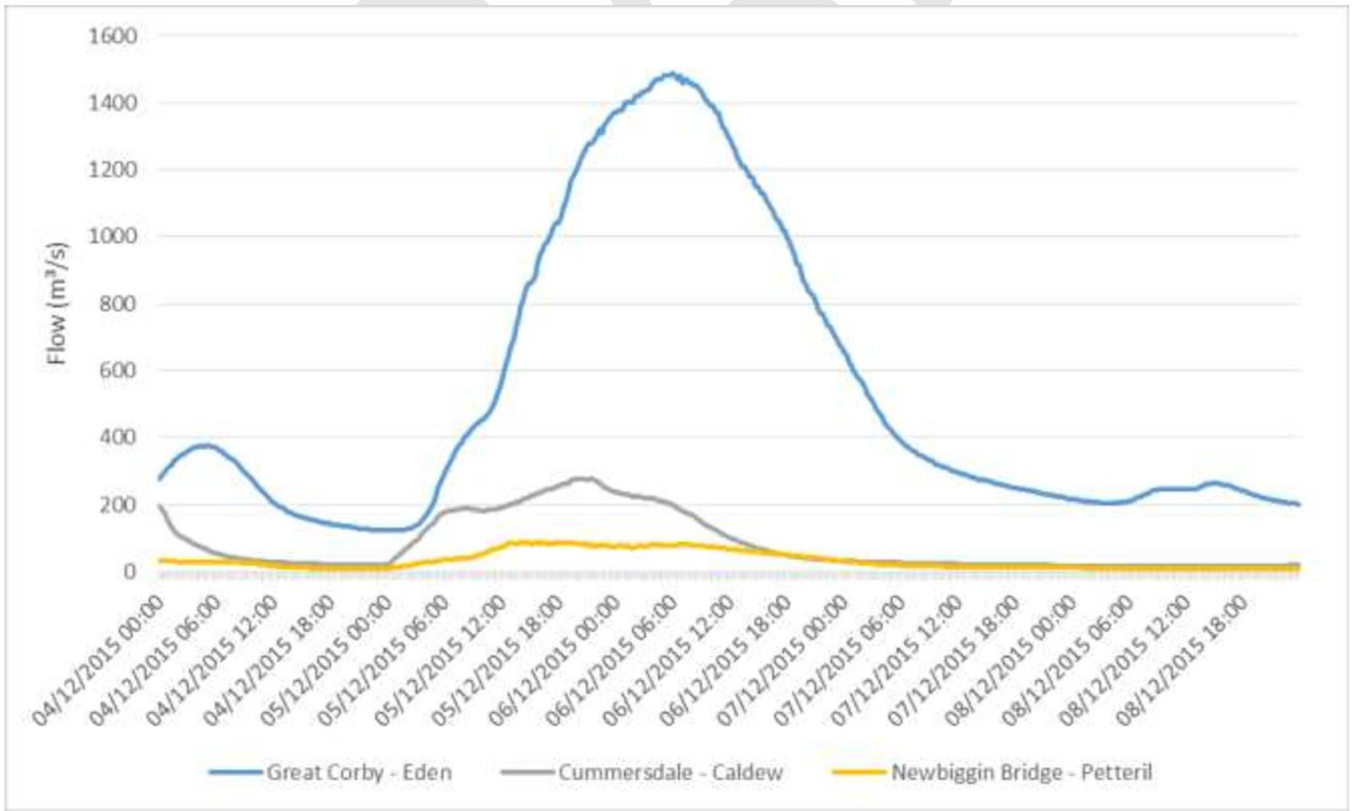


Figure 7 Flow recorded upstream of Carlisle during the December flood event

Flooding Flow Routes

There were a number of flood flow routes during the event. For investigation purposes, the flooded areas have been divided into the 7 sub areas shown in Figure 3.

The details of the flow routes into these areas, the likely causes, and the properties flooded are discussed in the 'Likely Causes of Flooding' section. There may also have been other flooding mechanisms that were not identified during this investigation.

Likely Causes of Flooding

Warwick Road East

Timeline

5th December	**Event**
1528	Flood Warning Issued
1734	**Severe Flood Warning Issued**
6th December	**Event**
0400	Flooding from drains reported on Tilbury Road
0400	River Petteril overtops right bank at Botcherby Bridge
0800	Flow from direction of flooded Tesco superstore
0800-0900	River Eden embankment overtopped
0815	**River Petteril peak at Botcherby Bridge – 4.36m**
0915	**River Eden peak at Sheepmount – 7.80m**
1000-1030	Reported flooding to Eden Park Crescent at the South-Eastern extent of the flooded area

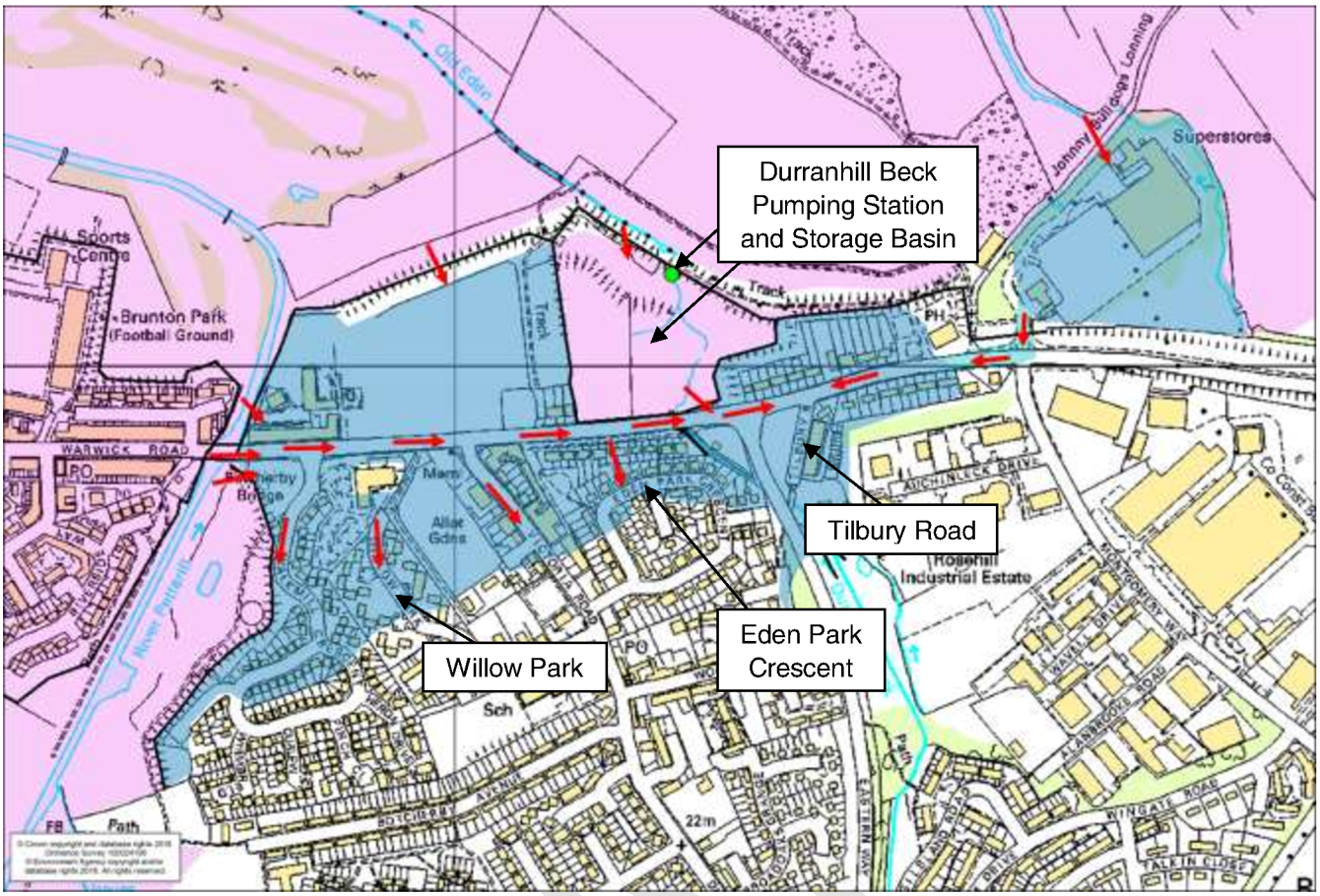


Figure 8 Flood Flow Routes in Warwick Road East area

This area is on the right bank of the River Petteril and left bank of the River Eden. There is also a smaller watercourse, Durranhill Beck, which flows through the area. Warwick Road crosses the River Petteril at Botcherby Bridge in this location. This area is primarily residential and was flooded from the River Petteril and also from the River Eden in the latter stages of the flood event.

This area is defended by a combination of embankments and walls along both rivers. There are also defences around Durranhill Beck creating a storage basin with a pumping station to discharge water from Durranhill Beck into the Eden during times of elevated water levels in the River Eden.

There was initial flooding from drains and road gullies surcharging before the defences were overtopped. This was reported in Willow Park and Tilbury Road.

The main flow route into this area was from the Petteril overtopping the defences upstream of Botcherby Bridge. Floodwater spilled onto Warwick Road, flowing in an easterly direction and flooding properties on Warwick Road and adjoining roads in the area.

Early in the event, Botcherby Bridge acted as an obstruction to flow leading to higher water levels upstream of the bridge and over topping of the left bank . However the defences on the right bank were not overtopped until high water levels in the River Eden caused flow in the River Petteril to back up.

The left bank of the River Petteril had flooded prior to the defences on the right bank being overtopped. This led to flood flows over Botcherby Bridge from the West of Warwick Road. This route, as well as the route from the overtopped defences, led to flows East down Warwick Road flooding the surrounding area.

The pumping station on Durranhill Beck pumps water stored in the storage basin when water cannot naturally flow into the River Eden during periods of high river levels. During the flood event the power supply to the area failed; following this the pumping station continued to run on an emergency generator until it exhausted its fuel and stopped pumping. This occurred in the early hours of Sunday morning, but the exact time that pumping stopped was not recorded. Whilst the pump was operational the storage basin for Durranhill Beck worked well and did not fill to capacity. Following the failure of the pumping station the basin filled and overtopped leading to additional flooding on Warwick Road.

The Tesco store at the east of this area was flooded directly from the River Eden. This store is not protected by flood defences. During the latter stages of the event on Sunday morning flood water overtopped the raised access road to the store (which forms part of the flood defence scheme). The access ramp may have formed a low point in the River Eden defences in this area. This flow route will have contributed to the flooding on the eastern extent of the flooded area of Warwick Road.

Figure 9 Flooded Tesco store with the flow route onto Warwick Road visible

The defences along the River Eden in this area were overtopped at the time of the peak flow in the River Eden. This was after the onset of flooding from the River Petteril.

This flooding occurred overnight with defences on the River Petteril reported to have been overtopped at 04:00 on Sunday 6th December. Affected residents described the flood as a gradual increase in levels. The properties furthest from the river were not flooded until later in the morning with properties in Eden Park Crescent not reported to have flooded until after 10am on the 6th December. These properties were flooded from the direction of Warwick Road but this may have occurred through the flow paths that developed later in the flood event.

Warwick Road West

Timeline

5th December	Event
1528	Flood Warning Issued
1600	Flooding from drains reported in Adelaide Street
1600	River Petteril begins to flood Melbourne Park from left bank
1734	**Severe Flood Warning Issued**
6th December	**Event**
0000	Reported flooding to Tullie Street, Greystone Road and Riverside Way from left bank of River Petteril
0300	Reported flooding to St Aidans Road from River Petteril
0815	**River Petteril peak at Botcherby Bridge – 4.36m**
0915	**River Eden peak at Sheepmount – 7.80m**

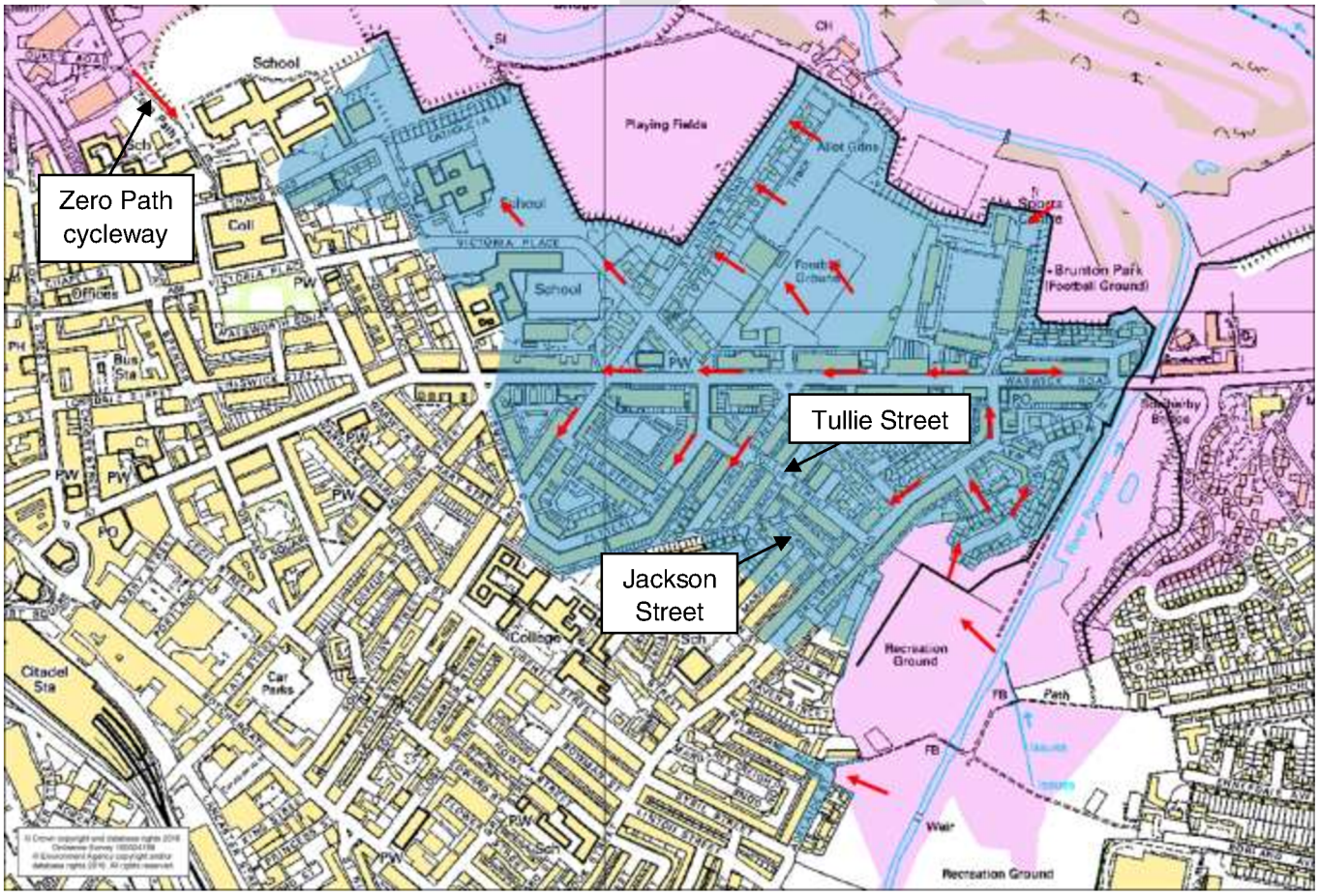


Figure 10 Flood Flow Routes in Warwick Road West area

This area is located on the left bank of the River Petteril on the opposite side of Botcherby Bridge. The flooded area is primarily residential with a number of schools also affected. There are flood defences along the banks of both rivers consisting of earth embankments and sheet piled walls. There were a number of properties that flooded during the flood event of the 5th and 6th December that had never flooded historically in this part of the city. This is a reflection of the size of the event experienced in December 2015.

This area is a relatively densely populated urban area with several blocks of terraced housing. Due to this, a large number of properties were flooded. This area accounts for a large proportion of the total flooded properties within Carlisle.

There was flooding reported early on Saturday afternoon to Adelaide Street. This was from the River Petteril outflanking the flood defences at Melbourne Park via a flow route upstream of these defences. There was also flooding from drains reported in the area at this time. This was reported to have occurred at 16:00 on the 5th December, significantly before the peak river levels in the Petteril and Eden. Residents in Jackson Street and Vasey Crescent reported that the properties in these streets closest to the River Petteril had water rising through the floorboards prior to flooding from the river.

The main flow route into this area was from defences being overtopped upstream of Botcherby Bridge. Melbourne Park was also flooded with the defences here being overtopped near the end of Riverside Way. As with the Warwick Road East area, this was exacerbated by the high levels in the River Eden. The defences within Melbourne Park were also out-flanked, as the river levels were greater than the ground level upstream of these defences. In addition to this, there was some leakage through the defences immediately upstream of Botcherby Bridge; some water was seeping through the corner joint of the defence wall before properties were flooded from the Melbourne Park route.

Figure 11 Melbourne Park and River Petteril during flood event

The overtopping of this defence led to flooding in Riverside Way, Greystone Road and Tullie Street at midnight. This flood route then continued to Warwick Road and flooded the neighbouring streets. This flooding extended as far as St Aidans Road and Newman & Trinity Schools. This also led to flood water flowing over Botcherby Bridge into the Warwick Road East area.

There was also flood flow reported down Zero Path from the direction of Hardwicke Circus. This also contributed to the flooding to the schools. The time of this flow was not recorded but is expected to have been after the onset on flooding from the River Petteril.

In this area, there was no evidence of overtopping along the River Eden defences. As such the majority of flooding is believed to have come from the River Petteril. Properties on St. Aidan's Road (alongside the River Eden) reported that flooding had come across the sports fields from the direction of the River Petteril. There were reports of the Carlisle City Rugby Club and Carlisle United football grounds flooding on Saturday night. This was possibly due to drainage systems backing up from where they outfall into the River Petteril.

Hardwick Circus

Timeline

5th December	Event
1528	Flood Warning Issued
1734	**Severe Flood Warning Issued**
1800	Flooding from drains reported in Hardwick Circus area
6th December	**Event**
0000-0030	Overtopping of defences between Bitts Park and Hardwick Circus
0215	Sands Centre defences overtopped
0215	Evacuation of properties on Corporation Road
0915	**River Eden peak at Sheepmount – 7.80m**

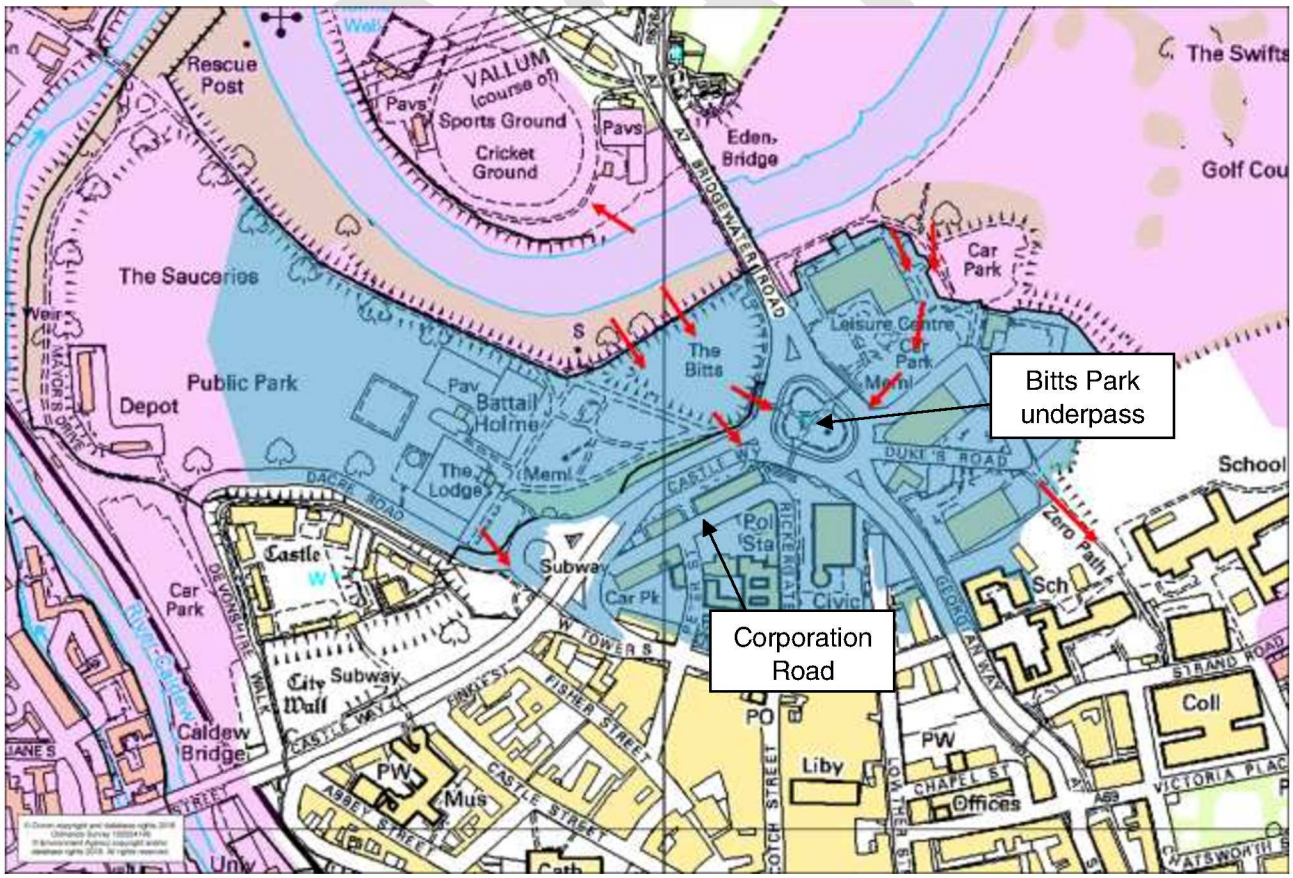


Figure 12 Flood Flow Routes in Hardwick Circus area

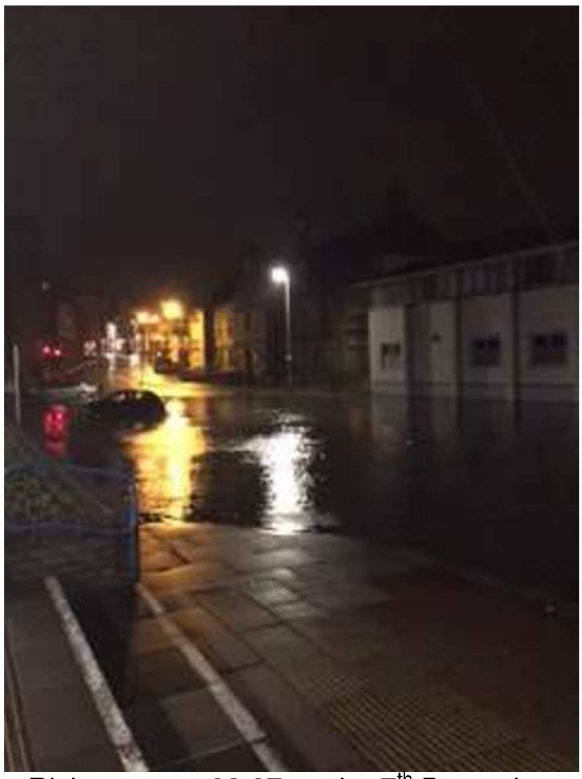
This is the area south of Eden Bridge and consists of commercial and retail buildings as well as Carlisle City Civic centre. To the north of the River Eden is the Cricket Ground which was badly affected during the flooding. The area is alongside the River Eden and there are flood defences along this riverbank in the form of embankments and reinforced concrete walls.

This area was initially flooded with surface water on Saturday evening then flooded from the River Eden when defences were overtopped. Defences were initially overtopped downstream of Eden Bridge at Bitts Park and at Dacre Road near Carlisle Castle. From this area, the flood water spreads under Castle Way and onto West Tower Street and Corporation Road. The water cascaded down the subway and rapidly filled the underpass and surrounding area. This flooding occurred around midnight and led to depths of up to 2m to the properties in this area. Subsequently, at around 02:15 on the 6th December, defences at the Sands Centre upstream of Eden Bridge were overtopped.

This area is adjacent to Eden Bridge, which carries the A7 trunk road. The left arch of this bridge was reported to have been blocked by debris during the flood event. This, combined with the flood flow level reaching to the top of the bridge arches will have increased river levels upstream of the bridge, and may have contributed to the overtopping of defences at the Sands Centre.

From this area there was flow down Zero Path towards Trinity School. This contributed to the flooding in the Warwick Road West area. The time of this flow was not recorded.

Figure 13 Hardwick Circus area during flood event



Rickergate at 23:07 on the 7th December

Peter Street facing towards Corporation Road at 03:23 on the 6th December

Figure 14 Photographs of Hardwick Circus area during the flood event

Rickerby

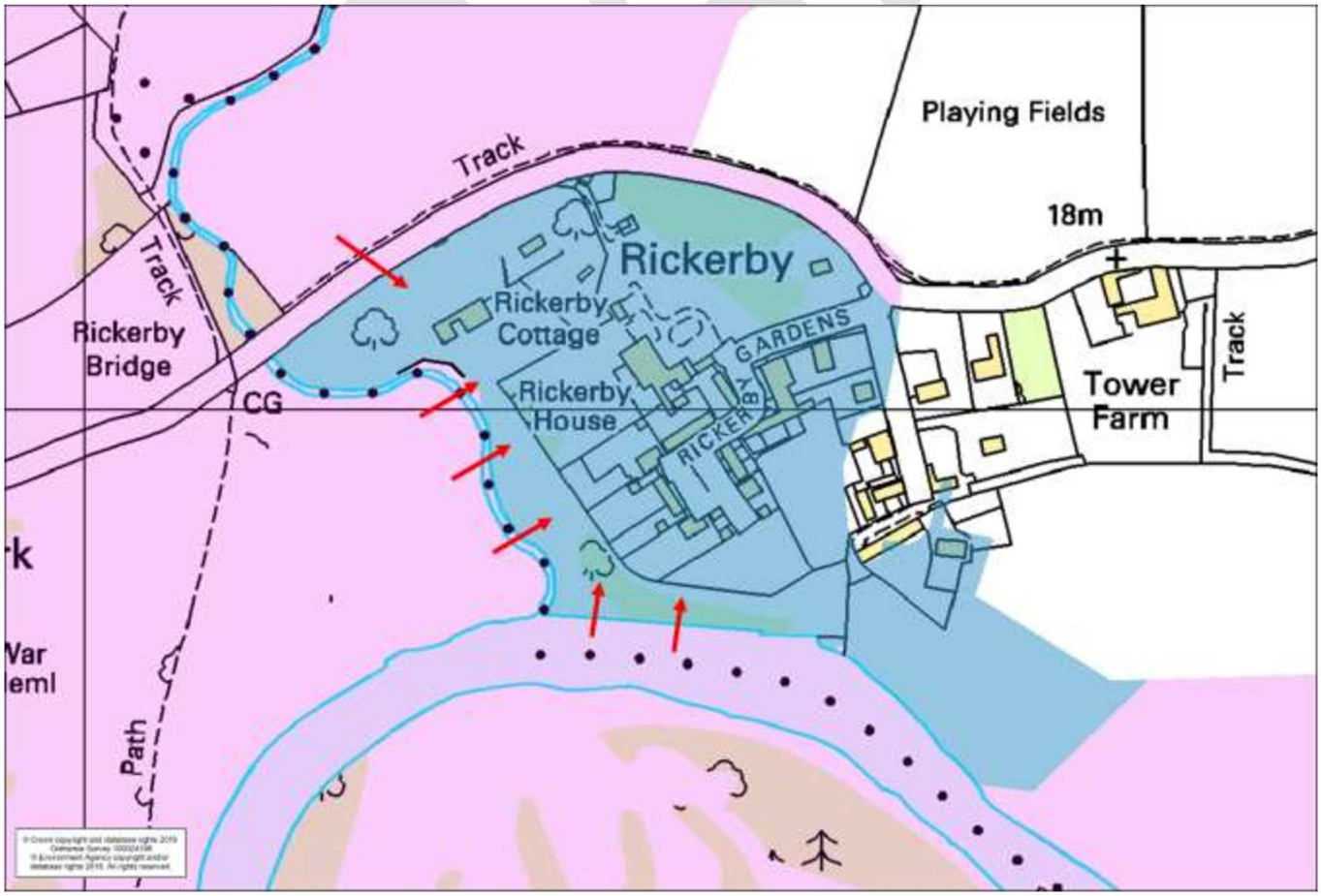


Figure 15 Flood Flow Routes in Rickerby

The majority of properties in Rickerby village are relatively new, and located in a residential development completed in 2004. Despite the village's close proximity to the River Eden there are limited flood defences in this area. The only raised defences consist of a small raised embankment to protect Rickerby House against minor flooding. As the area is at risk of flooding, many of the properties have property level protection.

As there are no significant defences for the Rickerby area, the village was flooded from both the River Eden and from the adjacent Brunstock Beck due to the high river levels in the River Eden. All but 2 properties within Rickerby Gardens were flooded as shown in Figure 15. Flood depths of up to 1.5m were recorded within these properties. The flooding extended to Rickerby Park where properties are at a higher ground level.

The onset of flooding to Rickerby is believed to have been around 21:00 hrs on the 5th December 2015 across the road to the north of the village. This was soon followed by water flooding from the Rickerby Park side of the village. Parts of the older Rickerby village were flooded on the Sunday at roughly 04:00 hrs.

Etterby Terrace

Timeline

5th December	Event
1522	Flood Warning Issued
1600	Reported flooding to Etterby Terrace properties from Gosling Syke
1734	**Severe Flood Warning Issued**
2130-2200	Reported overtopping of River Eden defences at Etterby Terrace
6th December	**Event**
0915	**River Eden peak at Sheepmount – 7.80m**

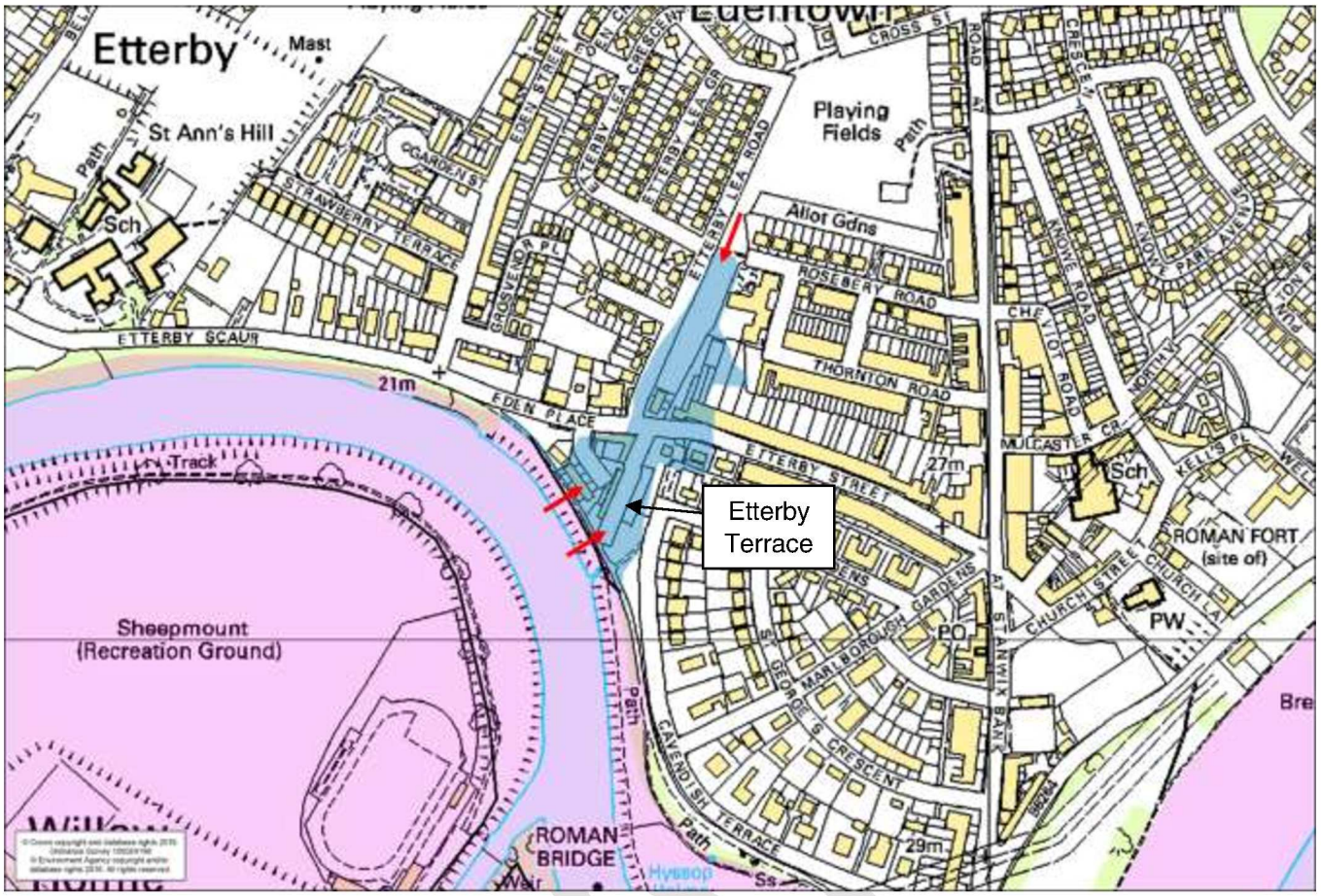


Figure 16 Flood Flow Routes in Etterby Terrace

This is an area of residential properties north of the River Eden. There is a flood defence wall along the River Eden at Etterby Terrace, constructed following flooding to this area in January 2005. There is also a culverted watercourse, Gosling Syke, which passes underneath this area and into the River Eden.

The River Eden overtopped this defence wall due to high river levels. This led to flooding in the area around the defence as shown in figure 16. However, the properties within this area reported that they had flooded prior to the defences overtopping.

Prior to the overtopping of the defences the properties within this area were flooded from surcharging surface water drains and from water rising through floors. This flooding was from Gosling Syke, a watercourse which passes underneath the area that was flooded. Residents reported that the Gosling Syke outfall is often blocked. However, this flooding may have been caused by high river levels in the Eden causing Gosling Syke to back up.

Willow Holme

Timeline

5th December	Event
1655	Flood Warning
1734	**Severe Flood Warning**
2100	**River Caldew peak at Skew Bridge – 5.04m**
2230	Defences overtopped on left bank of River Caldew at Caldew Maltings
2330	Little Caldew Pumping station fails due to flooding
6th December	**Event**
0915	**River Eden peak at Sheepmount – 7.80m**

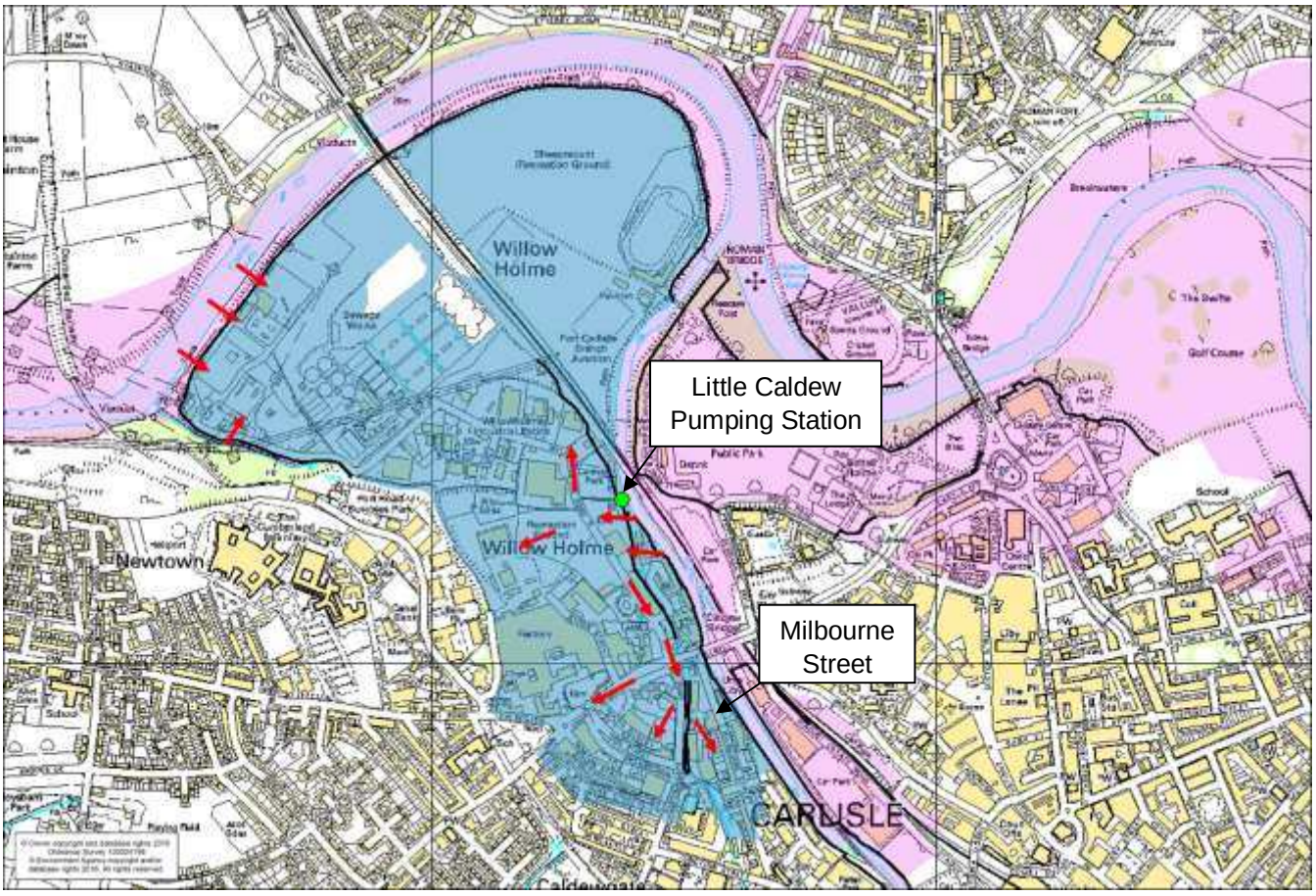


Figure 17 Flood Flow Routes in Willow Holme

This area is adjacent to both the River Caldew and River Eden. A large area was flooded including Carlisle sewage treatment works, Sainsbury's, Willow Holme industrial estate, the United Biscuits factory, and some of the Caldewgate residential area. In addition to the Rivers Eden and Caldew, there are also three smaller watercourses in this area, Parham Beck, Dow Beck, and the Little Caldew.

This area is protected by defences that were built following the floods in January 2005. There are walls and embankments along both banks of the River Caldew and a flood bund around the left bank of the River Eden. In addition to this, there are defence walls along Parham Beck, and a pumping station on

the Little Caldew mill race at the Caldew Maltings. This allows water from the mill race and Dow Beck to continue to discharge into the River Caldew when its water level is elevated. The Little Caldew flows from the River Caldew at Holme Head Weir via a sluice structure. This sluice structure is closed prior to high river levels and remains closed for the duration of flood events.

This area was flooded from both the River Caldew and River Eden due to flood defences being overtopped. The main locations where defences were overtopped are:

- The left bank of the River Caldew downstream of Caldew Bridge at Caldew Maltings and the Old Brewery
- The Sewage treatment works from the left bank of the River Eden
- Parham Beck running alongside the Sewage Treatment works and Willow Holme road

The areas where defences were overtopped are shown in Figure 17. Prior to the river flooding there was flooding reported from surface water drains. This was reported on Milbourne Street and in the Caldewgate area along the route of Dow Beck.

The defences on the River Caldew at Caldew Maltings overtopped at 22:30 on the 5th December. This is thought to be the main route through which most of this area was flooded. The time at which the Eden defences were overtopped was not recorded, but is thought to have occurred on Sunday morning after the flooding from the Caldew.

This was one of the first areas of the city that was flooded, with flooding occurring on the 5th December. This was due to this area being at risk from the River Caldew, which peaked before the Rivers Eden and Petteril. Despite this, defences were not overtopped until after the peak flow in the River Caldew, suggesting that flooding was due to restriction of flow caused by high levels in the River Eden.

This area of Carlisle contains several pieces of infrastructure that play a role in how flooding occurs. These include road and rail bridges and railway embankments. The Environment Agency needs to work with Network Rail to better understand the role that their bridges played to the flooding in this location. It also needs to understand how the West Coast main line embankment and railway line acted as flow routes into the city (see page 26 Viaduct Estate).

During the event, the pumping station on the Little Caldew at the Caldew Maltings stopped operating, as this was flooded. This pumping station failed due to flooding of the electrical components at 23:30 on the 5th December shortly after the defences at Caldew Maltings were overtopped. A number of properties flooded from the direction of the Little Caldew after this, and it is thought that this pumping station reduced the extent of this flooding whilst it was operational.

Properties at the Barrel House in the Maltings form part of the riverside wall at this location. They also form part of the defended line for the flood defence scheme along the left hand bank of the River Caldew. These properties suffered internal flooding through the floors and walls prior to the flood defences at the Maltings over topping.

There was a large amount of oil and diesel reported in this area following the flooding. This was from flooded commercial properties dealing in motor vehicles. This created pollution within the flooded area and additional challenges for properties recovering from flooding.

Figure 18 Cars in Willow Holme area covered with oil following flooding

Viaduct Estate

Timeline

5th December	Event
1530	Flood Warning
1600	Flooding of West Coast Main Line on right bank of River Caldew
1734	**Severe Flood Warning**
2100	**River Caldew peak at Skew Bridge – 5.04m**
6th December	**Event**
0915	**River Eden peak at Sheepmount – 7.80m**

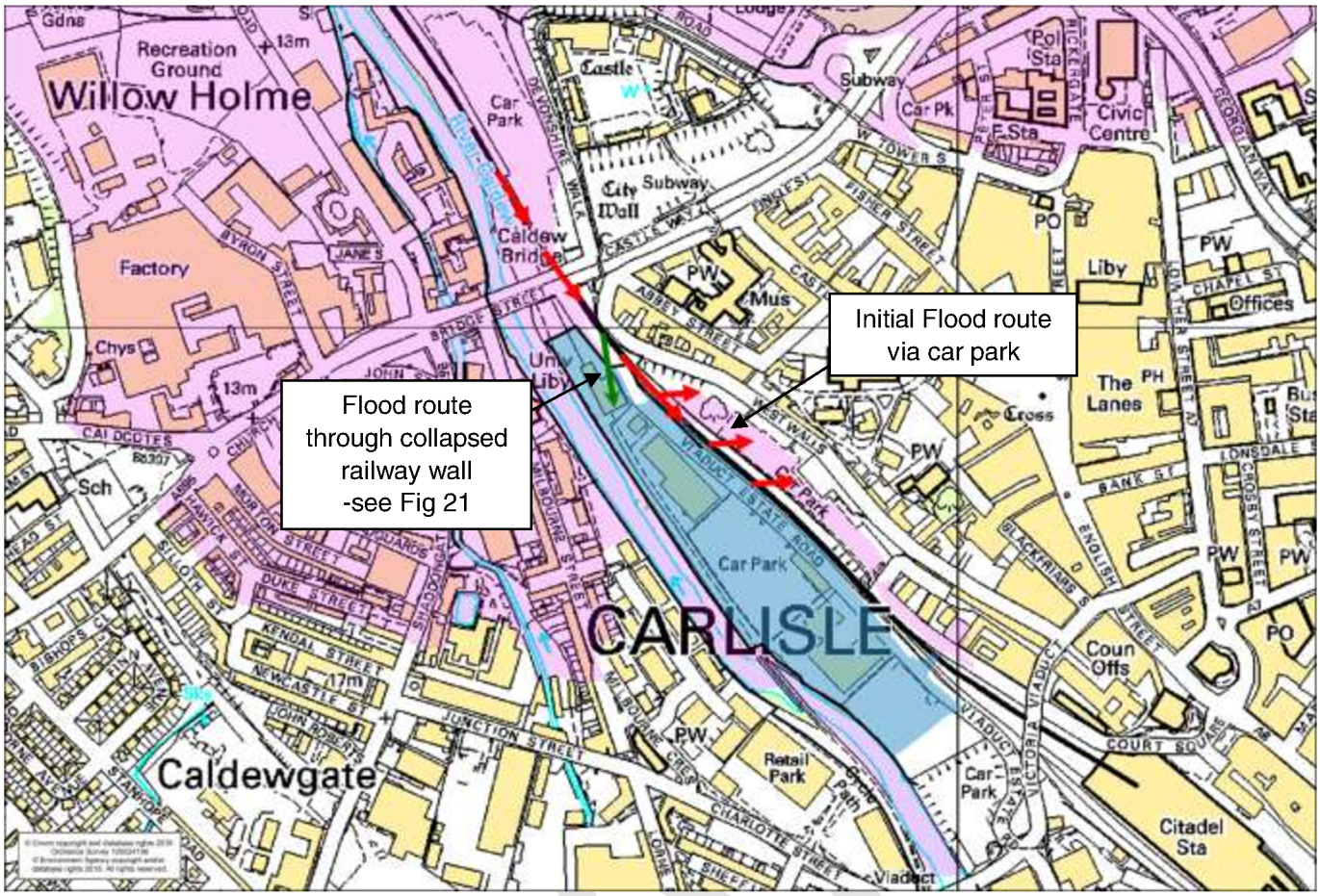


Figure 19 Flood flow routes into Viaduct Estate

The Viaduct Estate is a retail and leisure area located between the River Caldew and the West Coast Main Line railway. The area is protected from direct flooding from the River Caldew by a flood defence wall along the right bank (when looking downstream) of the River Caldew.

The flood defence wall upstream of Caldew Bridge on the right hand bank was not overtopped. The flooding of the Viaduct Estate was due to this defence being outflanked by water flooding out of bank downstream of Caldew Bridge, then flowing along the railway line and into the West Walls car park to the east of the railway. This is the route shown in red on Figure 19. From this car park, the water rose to a level where it passed through the open arches beneath the railway and into Viaduct Estate, flooding the properties within this area.

Later in the flood event, a section of the railway wall was breached at this location. The wall collapsed onto the footpath indicating that the breach was caused by the water on the railway line. Following this, the flow path into the viaduct estate would be directly from the railway line through this breach. This is the route shown in green on Figure 19.

When this area has been flooded previously, this was partly due to surcharging drains. This was not reported during this event but may have occurred prior to the river flooding.

Figure 20 Viaduct Estate during flood event

Figure 21 Wall along railway at entrance to Viaduct Estate that collapsed during the flood event

Environment Agency Flood Incident Response

The Environment Agency's response to the flood event on the 5th and 6th December 2015 started well in advance of the event. This response included the closure of flood gates and clearing of grids in the city. Additional resources including manpower and machinery such as pumps were also brought to the city.

The Environment Agency and Cumbria County Council are members of the Cumbria Local Resilience Forum. The Cumbria Local Resilience Forum (LRF) is a partnership, made up of all the organisations needed to prepare for and respond to any major emergency in the LRF area. All services and organisations worked together prior to and during the flooding to ensure that the best possible preparations and plans were in place.

A flood alert for the lower River Eden was issued on the 4th of December at 15:08. Flood warnings were issued to the flood warning areas within Carlisle between 13:11 and 16:55 on the 5th December. The details of the flood warning areas and the timings of these warnings is shown in Appendix 4.

A severe flood warning was issued at 17:34. The majority of properties reported that they had received these warnings within good time.

There were additional challenges with flood warnings, due to parts of the city flooding overnight. A number of residents did not respond to flood warnings because of this, and they therefore wrongly assumed that as the area was not flooded on Saturday evening following the severe flood warning, the risk of flooding had passed.

A number of properties affected by the flood event did not receive flood warnings as the residents were not registered with the Environment Agency's flood warning system. It was also recognised that the details stored for some residents were not up to date. The Environment Agency's Flood Resilience team have already made improvements to the flood warning service with 437 new customers registered to receive Flood Warnings Direct. The total of fully registered customers for Carlisle is up to 4330.

Timeline

The table below shows the times of key events during the Carlisle flooding.

4th December	Event
1508	Flood Alert Issued
5th December	**Event**
1311-1655	Flood Warnings
1600	Flooding from left bank of River Petteril via route upstream of defences in Melbourne Park
1600	Flooding from drains reported in Warwick Road West area
1600	Flooding of West Coast Main Line on right bank of River Caldew
1600	Reported flooding to Etterby Terrace properties from Gosling Syke through drainage system
1734	**Severe Flood Warning issued for Carlisle**
1800	Flooding from drains reported in Hardwick Circus area
2100	**River Caldew peak at Skew Bridge – 5.04m**
2100	Reports of flooding at Rickerby
2130-2200	Reported overtopping of River Eden defences at Etterby Terrace
2230	Defences overtopped on left bank of River Caldew at Caldew Maltings (Willow Holme)
2330	Little Caldew Pumping station (Willow Holme) fails due to flooding
6th December	**Event**
0000	Reported flooding to Tullie Street from overtopping of defences on left bank of River Petteril
0000-0030	Overtopping of defences between Bitts Park and Hardwick Circus
0215	Overtopping of defences at the Sands Centre
0300	Reported flooding to St. Aidans road from River Petteril
0400	Flooding from drains reported on Tilbury Road in Warwick Road East area
0400	River Petteril overtops right bank at Botcherby Bridge leading to flooding of Warwick Road East area
0800	Flow into Warwick Road East area from direction of flooded Tesco superstore
0800-0900	River Eden embankment overtopped in Warwick Road East area
0815	**River Petteril peak at Botcherby Bridge – 4.36m**
0915	**River Eden peak at Sheepmount – 7.80m**
1000-1030	Reported flooding to Eden park Crescent on eastern extent of Warwick Road East area

Recommended Actions

The following table details recommended actions for various organisations and members of the public to consider using the Cumbria Floods Partnerships 5 Themes: Community Resilience, Upstream Management, Strengthening Defences, Maintenance, and Internal Drainage Boards (IDB's). Some of these recommendations may have already been carried out and or are ongoing.

Some of the actions referred to below are identified on the location map (fig. 22) following this table.

Cumbria Flood Partnership Theme	Action by	Recommended Action	Timescale
Community Resilience	Cumbria Local Resilience Forum *	Review and update plans to enable homes & business to be better prepared for flooding & reduce the impacts of flooding	2016
	Environment Agency and Cumbria County Council Highways, Network Rail and Electricity North West.	To review the flood risk and resilience of critical transport and power supply infrastructure.	Autumn 2016
	Environment Agency and Cumbria County Council Highways	Investigate potential to increase the flood flow capacity of Botcherby Bridge and Eden Bridge	Summer 2016
	Cumbria Planning Group, Carlisle City Council, Cumbria County Council and Environment Agency	Review Local Development Plans and Strategic Flood Risk Assessment to reflect current understanding of flooding	2016
	Environment Agency	Ensure all properties at risk can register to receive flood warnings and details are up-to-date.	Summer 2016
Upstream Management	Cumbria Floods Partnership (CFP)	The CFP action plan will consider natural flood management options to reduce flood risk across the catchment. This may also include land use changes and or flood storage.	July 2016
Maintenance	County Council, United Utilities and Carlisle City Council	Review and investigate drainage and sewage systems for which they are responsible to better understand where improvements are required.	2016
	Environment Agency and Cumbria County Council	Review outfalls to the River system within Carlisle and	Summer 2016

		ensure all outfalls are sealed with flap valves or non-return valves to prevent the defence scheme being compromised.	
	Environment Agency, United Utilities and Cumbria County Council	Complete on-going inspections and repairs to assets which may have been damaged during the flood event	2016
Strengthening Defences	Environment Agency	Review modelling data to ensure that models for Carlisle reflect real conditions as accurately as possible and use this information to make any improvements to the flood warnings service. This will be used to inform future investment plans.	July 2016
	Environment Agency	Review scheme performance and consider what worked well, and where improvements to defences are required	July 2016
	Environment Agency	Investigate potential to improve defences upstream of Botcherby Bridge to prevent overtopping and outflanking of defences in Melbourne Park.	July 2016
	Environment Agency in consultation with Network Rail	Investigate potential to extend the defences at Viaduct Road Estate to prevent flooding from the railway line. This could potentially consist of defence walls along the railway line or temporary barriers across the archways between the car park and viaduct road estate.	July 2016
	Environment Agency	Promote a flood defence scheme at Rickerby village.	Summer 2016
	Environment Agency	Improve resilience of pumping stations at Durranhill Beck and Little Caldew so that these assets remain in operation longer during severe flood events.	Summer 2016

	Environment Agency	Etterby Terrace experienced flooding from the drainage system, Gosling Syke and latterly the River Eden. All these sources of flooding need to be investigated	Summer 2016
	Environment Agency	The Environment Agency is carrying out a series of repairs to flood defence assets that were damaged during the floods as part of a c.£10m Asset Recovery Programme which covers Cumbria & Lancashire. This programme of repairs is scheduled to be complete before winter 2016/17 and includes work such as repairing the pumping station at the confluence of the Little Caldew and the River Caldew, reinstating embankments which suffered scour damage and removing large debris and silt/gravel build up from within the river channels.	Winter 2016

* The Cumbria Local Resilience Forum includes emergency services, Local Authorities, Cumbria County Council, Environment Agency, Maritime Coastguard Agency and health agencies along with voluntary and private agencies. Under the Civil Contingencies Act (2004) every part of the United Kingdom is required to establish a resilience forum.

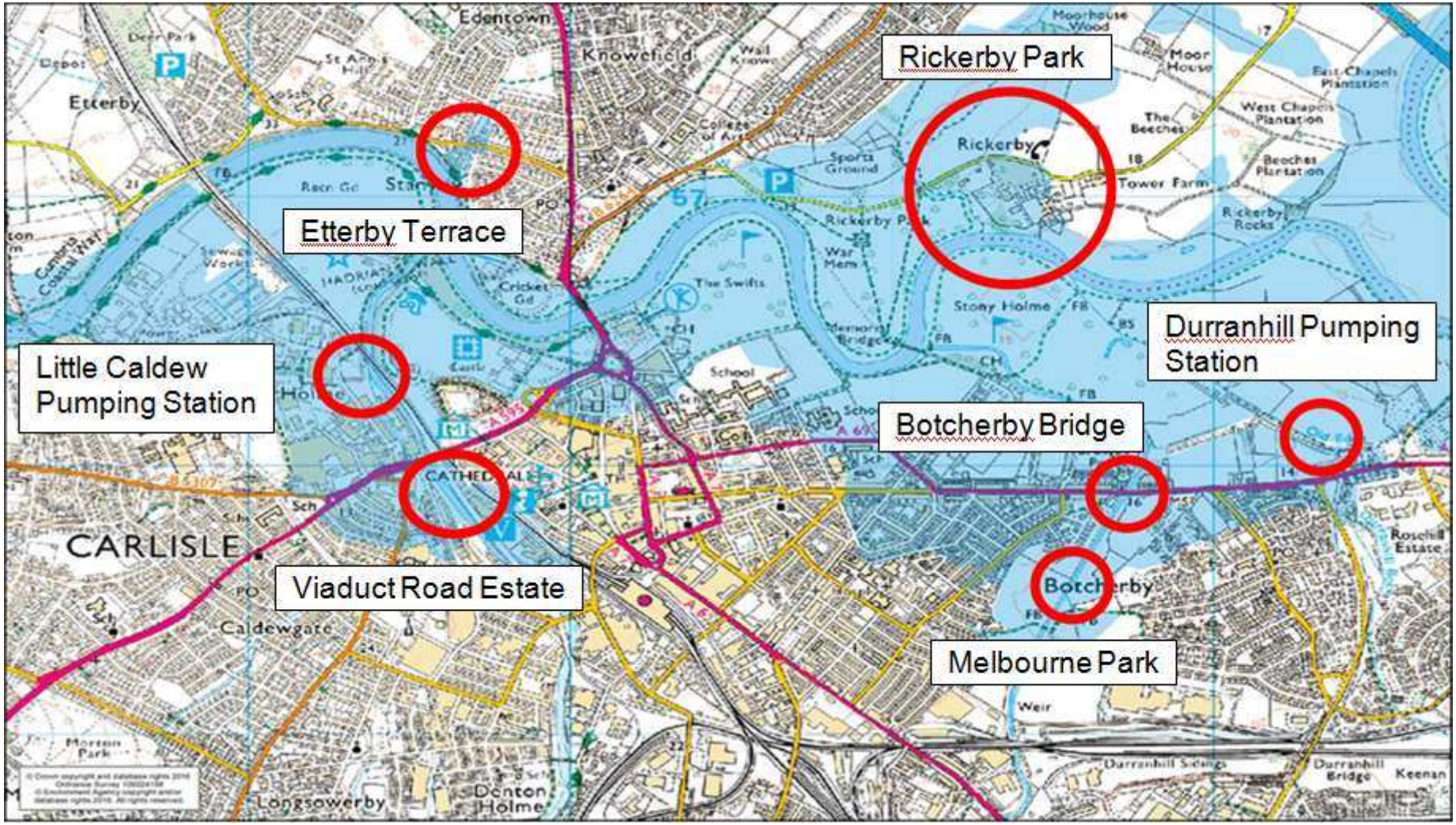


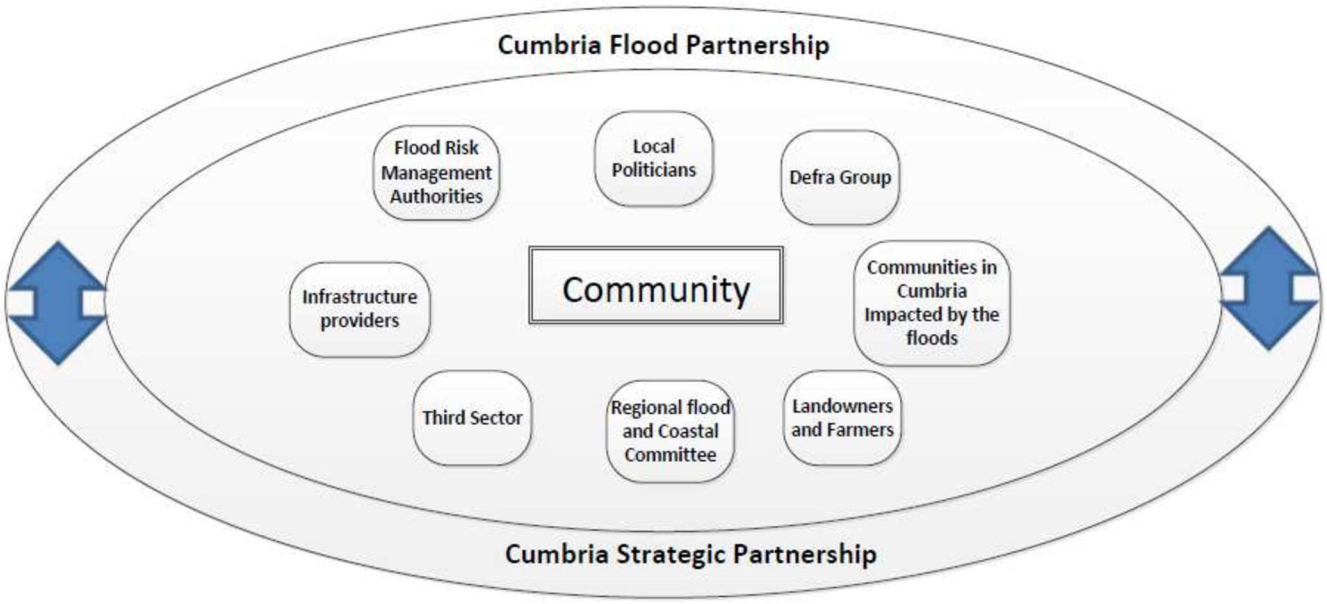
Fig. 22 Recommended Action Locations

Next Steps

The Cumbria Floods Partnership has brought together a wide range of community representatives and stakeholders from a variety of sectors to plan and take action to reduce flood risk. The Cumbria Floods Partnership, led by the Environment Agency, is producing a 25 year flood action plan for the Cumbrian catchments worst effected by the December 2015 flooding, including Carlisle. The plan will consider options to reduce flood risk across the whole length of a river catchment including upstream land management, strengthening flood defences, reviewing maintenance of banks and channels, considering water level management boards and increasing property resilience. The Cumbria Floods Partnership structure below details how these 5 themes are being delivered in the Flood Action plans which will be completed in July.

The 'Cumbria Floods Partnership' was set up by Flood Minister Rory Stewart following December's floods and includes all of Cumbria's Flood Risk Management Authorities. They are working alongside the existing 'Cumbria Strategic Partnership', which was formed as part of the Flood and Water Management Act and comprises of the county's Flood Risk Management Authorities (RMAs) including the Environment Agency, Cumbria County Council, Local Authorities and United Utilities. Both partnerships are working with communities, businesses and relevant stakeholders to understand and reduce flood risk across Cumbria.

This diagram below helps demonstrate how the two partnerships are working together:



Appendices

Appendix 1: Glossary

AEP	Annual Exceedance Probability
ARI	Annual Recurrance Interval
AOD	Above Ordnance Datum
CCC	Cumbria County Council
EA	Environment Agency
FAG	Flood Action Group
FWD	Flood Warnings Direct
LLFA	Local Lead Flood Authority
LRF	Local Resilience Forum
MsfWG	Making space for Water Group
RMA	Risk Management Authority

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

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 the LLFA'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 (RMA's). 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 under the Flood & Water Management Act 2010. 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 RMA 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 RMA's to maximise knowledge of flood risk to all involved. This function is carried out at CCC by the Development 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. These organisations are classed as RMA's.

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. These organisations are classed as RMA's

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. These organisations are classed as RMA's

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 process 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: Links to Other Information on Flooding

Sign up for Flood Warnings
https://www.gov.uk/sign-up-for-flood-warnings

Environment Agency – Prepare your property for flooding; a guide for householders and small businesses to prepare for floods
https://www.gov.uk/government/publications/prepare-your-property-for-flooding

Environment Agency – What to do before, during and after a flood: Practical advice on what to do to protect you and your property
https://www.gov.uk/government/publications/flooding-what-to-do-before-during-and-after-a-flood

Environment Agency – Living on the Edge: A guide ot the rights and responsibilities of riverside occupiers
https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

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

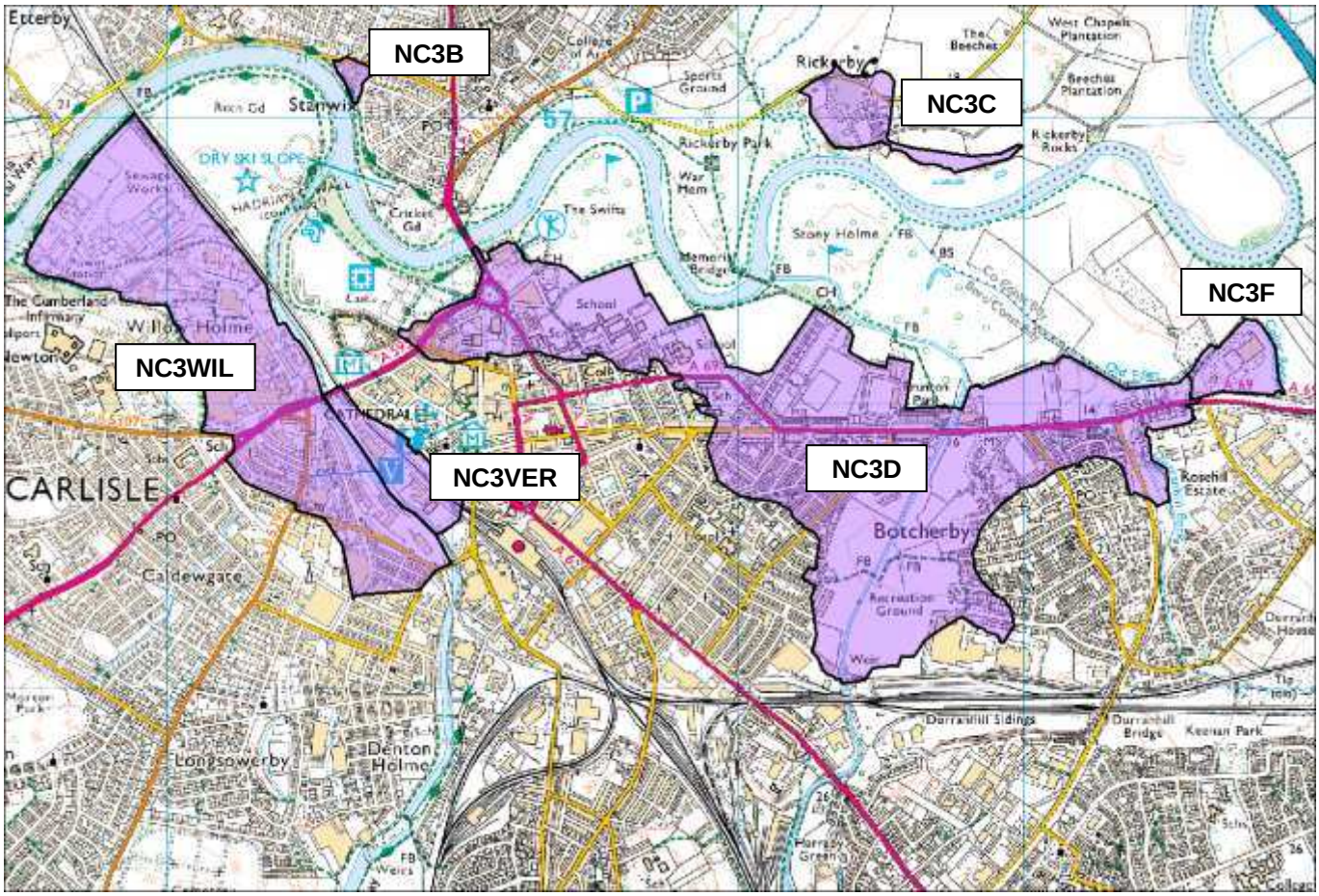
Water Resources Act 1991:
http://www.legislation.gov.uk/all?title=water%20resources%20act

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

Appendix 4: Flood Warnings and Alerts

Carlisle is covered by a Flood Alert, and certain areas are additionally served by 13 Flood Warnings including the 6 shown in the map above. Flood Warning Areas are well defined following the major flood event in 2005. Flood Warning Levels will be reviewed in terms of revised modelling for the Rivers Eden, Caldew and Petteril and some amendments to these areas are anticipated.

The table below summarises the times of the flood warnings issued during this flood event:



Flood Warning Areas within Carlisle

Flood Warning Area	Flood Warning Issued (05/12/15)	Severe Flood Warning Issued (05/12/15)	Properties	Contacts	%Success
NC3B River Eden at Etterby Terrace and Eden Place	15:22	17:34	53	104	68%
NC3C River Eden at Rickerby Village	13:11	17:34	72	145	72%
NC3F River Eden at Tesco Store Warwick Road	15:28	17:34	29	70	69%
NC3VER The River Caldew at Viaduct Estate Road Area	15:30	17:34	33	76	68%
NC3D River Eden and Petteril at City Centre, Botcherby and Warwick Road Area	15:28	17:34	1887	2488	73%
NC3WIL The River Caldew and Eden at Willowholme, Caldewgate, Shaddongate	16:55	17:34	781	922	67%

The following pages show additional details on the flood alerts and warnings issued during this event.

Flood Alerts:

011WAFLE- Lower River Eden

Alert issued on Thursday 03/12/2015 at 14:46
Alert issued on Friday 04/12/2015 at 15:08

Customers in Flood Alert area registered on FWD: 332
Contacts (landline, mobile, email etc) in Flood Alert area registered on FWD: 1051
Successful contacts: 911
Unsuccessful contacts: 140

Alert Message:
A Flood Alert has been issued by the Environment Agency for the Lower River Eden.
Flooding is possible for River Eden and its tributaries from its confluence with the River Irthing through Crosby-on-Eden and Carlisle to the Solway Firth at Rockcliffe.

Flood Warning Target Areas:

011FWFNC3A- River Eden at Carlisle, Rickerby Park, Swifts and Stoneyholme Golf Courses

Flood Warning issued on Thursday 03/12/2015 at 23:59
Flood Warning removed on Friday 04/12/2015 at 12:05

Date/Time Warning Level Reached: 04/12/2015 03:00
Time customers had to take action: 03:01:00
Customers in Flood Warning area registered on FWD: 52
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 169
Successful contacts: 115
Unsuccessful contacts: 54

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Carlisle, Rickerby Park, Swifts and Stoneyholme Golf Courses.
Flooding is expected for Low lying roads and car parks, Residential and commercial properties. Flooding is expected from 03:00 on Friday. Immediate action required.
Following heavy rainfall throughout the river catchment on Thursday evening the river level has risen and is likely to cause flooding in this area in the early hours on Friday 4th December 2015. The river level is likely to start falling by mid morning with Friday being a mainly dry day. However, further significant rainfall is expected from late Friday and throughout Saturday which will probably result in the river level rising to higher levels.

Flood Warning issued on Friday 04/12/2015 at 21:50
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:51

Date/Time Warning Level Reached: 05/12/2015 09:00
Time customers had to take action: 11:10:00
Customers in Flood Warning area registered on FWD: 52
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 171
Successful contacts: 116
Unsuccessful contacts: 55

Severe Warning Message:
Severe Flooding. Danger to life. A Severe Flood Warning has been issued by the Environment Agency for the River Eden at Carlisle, Rickerby Park, Swifts and Stoneyholme Golf Courses.
This Severe Flood Warning is for Low lying roads and car parks, Residential and commercial properties.

011FWFNC3B - River Eden at Carlisle, Etterby Terrace and Eden Place

Flood Warning issued on Saturday 05/12/2015 at 15:22
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:55

Date/Time Warning Level Reached: 05/12/2015 23:00
Time customers had to take action: 07:37:25
Customers in Flood Warning area registered on FWD: 53
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 153
Successful contacts: 104
Unsuccessful contacts: 49

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Carlisle, Etterby Terrace and Eden Place.

Flooding is expected for Low lying roads, residential & commercial properties adjacent the rivers Eden & Caldew including areas of Stanwix, Etterby Terrace and Eden Place. Immediate action required.
Heavy and persistent rainfall is expected throughout Saturday. River levels will continue to rise and further Flood Warnings are likely. Please check for updates throughout the weekend. Operational Teams have closed flood defences and are checking watercourses for blockages.

011FWFNC3BP - River Eden and Caldew at Carlisle, Devonshire Walk, West Coast Mainline, Bitts Park, Cricket Club

Flood Warning issued on Friday 04/12/2015 at 22:58
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning downgraded to Flood Warning on Tuesday 08/12/2015 at 17:11
Flood Warning removed on Wednesday 09/12/2015 at 11:27

Date/Time Warning Level Reached: 05/12/2015 15:15
Time customers had to take action: 16:16:04
Customers in Flood Warning area registered on FWD: 31
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 109
Successful contacts: 80
Unsuccessful contacts: 29

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden and Caldew at Carlisle, Devonshire Walk, West Coast Mainline, Bitts Park, Cricket Club.
Flooding is expected for River Eden and Caldew at Carlisle, Devonshire Walk and West Coast Mainline, Bitts Park, Cricket Club, Sheepmount. Immediate action required.

011FWFNC3C - River Eden at Carlisle, Rickerby Village

Flood Warning issued on Saturday 05/12/2015 at 13:11
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 17:04
Date/Time Warning Level Reached: 05/12/2015 17:45
Time customers had to take action: 04:33:30
Customers in Flood Warning area registered on FWD: 72
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 201
Successful contacts: 145
Unsuccessful contacts: 56

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Carlisle, Rickerby Village.
Flooding is expected for Low lying roads, agricultural land, residential and commercial properties around the River Eden at Rickerby Village. Immediate action required.

011FWFNC3CUM - River Caldew at Cummersdale, Factory

Flood Warning issued on Thursday 03/12/2015 at 20:29
Flood Warning removed on Friday 04/12/2015 at 08:23
Date/Time Warning Level Reached: 03/12/2015 20:45
Time customers had to take action: 00:15:22
Customers in Flood Warning area registered on FWD: 29
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 104
Successful contacts: 74
Unsuccessful contacts: 30

Flood Warning issued on Thursday 05/12/2015 at 01:21
Flood Warning removed on Friday 06/12/2015 at 19:04

Date/Time Warning Level Reached: 05/12/2015 04:45
Time customers had to take action: 03:23:32
Customers in Flood Warning area registered on FWD: 29
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 104
Successful contacts: 77
Unsuccessful contacts: 27

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Caldew at Cummersdale, Factory.
Flooding is expected for River Caldew at Cummersdale, Factory. Immediate action required.

011FWFNC3D - River Eden and Petteril at Carlisle, City Centre, Botcherby and Warwick Road Area

Flood Warning issued on Saturday 05/12/2015 at 15:28
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning downgraded to Flood Warning on Tuesday 08/12/2015 at 16:54
Flood Warning removed on Wednesday 09/12/2015 at 11:27

Date/Time Warning Level Reached: 06/12/2015 00:15
Time customers had to take action: 08:47:00
Customers in Flood Warning area registered on FWD: 1887
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 3421
Successful contacts: 2488
Unsuccessful contacts: 933

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden and Petteril at Carlisle, City Centre, Botcherby and Warwick Road Area.
Flooding is expected for Low lying roads, agricultural land, residential & commercial properties in Carlisle adjacent Rivers Eden and Petteril including City Centre, Botcherby and Warwick Road Areas. Immediate action required.

011FWFNC3DH - River Caldew at Carlisle, Denton Holme, Bousteads Grassing, James Street Area

Flood Warning issued on Saturday 05/12/2015 at 15:28
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:49

Date/Time Warning Level Reached: Did not reach threshold.
Time customers had to take action: N/A
Customers in Flood Warning area registered on FWD: 2019
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 3273
Successful contacts: 2247
Unsuccessful contacts: 1026

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Caldew at Carlisle, Denton Holme, Bousteads Grassing, James Street Area.
Flooding is expected for River Caldew at Carlisle, Denton Holme, Bousteads Grassing, James Street Area. Immediate action required.

011FWFNC3F - River Eden at Carlisle, Tesco Store Warwick Road

Flood Warning issued on Saturday 05/12/2015 at 15:28
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:55

Date/Time Warning Level Reached: 05/12/2015 20:45
Time customers had to take action: 05:16:18
Customers in Flood Warning area registered on FWD: 29
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 102
Successful contacts: 70
Unsuccessful contacts: 32

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Carlisle, Tesco Store Warwick Road.
Flooding is expected for Low lying roads and agricultural land, adjacent to the River Eden at Tesco Store, Warwick Road. Immediate action required.

011FWFNC3VER - River Caldew at Carlisle, Viaduct Estate Road Area

Flood Warning issued on Saturday 05/12/2015 at 15:30
Severe Flood Warning issued on Sunday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:59

Date/Time Warning Level Reached: Did not reach threshold.
Time customers had to take action: N/A
Customers in Flood Warning area registered on FWD: 33
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 112
Successful contacts: 76
Unsuccessful contacts: 36

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Caldew at Carlisle, Viaduct Estate Road Area.
Flooding is expected for River Caldew at Carlisle, Viaduct Estate Road Area. Immediate action required.

011FWFNC3WIL - River Caldew and Eden at Carlisle, Willowholme, Caldewgate, Shaddongate

Flood Warning issued on Saturday 05/12/2015 at 16:55
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:57

Date/Time Warning Level Reached: Did not reach threshold.
Time customers had to take action: N/A
Customers in Flood Warning area registered on FWD: 781
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 1386
Successful contacts: 922
Unsuccessful contacts: 464

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Caldew and Eden at Carlisle, Willowholme, Caldewgate, Shaddongate.
Flooding is expected for River Caldew and Eden at Carlisle, Willowholme, Caldewgate, Shaddongate. Immediate action required.

011FWFNC3LC - Little Caldew

Severe Flood Warning issued on Saturday 05/12/2015 at 17:36
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:55
Customers in Flood Warning area registered on FWD: 255
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 483
Successful contacts: 400
Unsuccessful contacts: 183

Warning Message:
Severe Flooding. Danger to life. A Severe Flood Warning has been issued by the Environment Agency for the Little Caldew.
This Severe Flood Warning is for Flooding of properties from the Little Caldew.

011FWFNC3DUR - Durranhill

Flood Warning issued on Sunday 06/12/2015 at 17:15
Flood Warning removed on Tuesday 08/12/2015 at 17:32

Date/Time Warning Level Reached: Do not forecast for this threshold.
Customers in Flood Warning area registered on FWD: 431
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 848
Successful contacts: 571
Unsuccessful contacts: 277

Warning Message:
A Flood Warning has been issued by the Environment Agency for the Durranhill. Flooding is expected for Flooding of properties adjacent to Durranhill Beck. Immediate action required.
Durranhill pumping station is no longer operational. Water levels will continue to rise in this area for several hours.

011FWFNC3WH - Willowholme Surface Water

Flood Warning issued on Saturday 05/12/2015 at 15:30
Severe Flood Warning issued on Saturday 05/12/2015 at 17:34
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:48

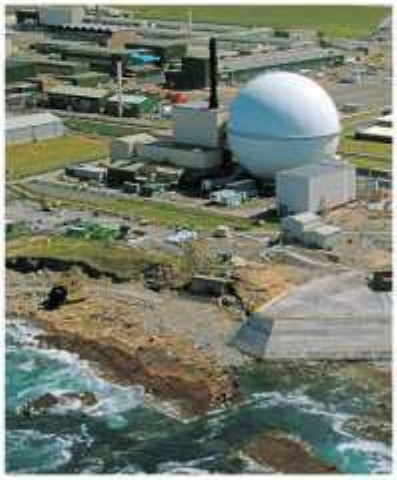
Date/Time Warning Level Reached: Do not forecast for surface water, no threshold.
Customers in Flood Warning area registered on FWD: 73
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 218
Successful contacts: 147
Unsuccessful contacts: 71

Warning Message:
A Flood Warning has been issued by the Environment Agency for the Willowholme Surface Water. Flooding is expected for Flooding of Willowholme area due to surface water and drainage issues. Immediate action required.

Appendix 5: CH2M Hill UK Projects and Flood Risk Management brochure

CH2MHILL.

Key Projects in the UK



We partner with your industry

- Municipal Water, Wastewater, and Water Supply
- Aviation, Ports, Transit, and Rail
- Nuclear Decontamination and Decommissioning
- Chemical Manufacturing
- Environmental Remediation and Compliance Management
- Environmental Industrial Systems
- Commercial Nuclear
- Oil and Gas
- Electronics and Advanced Technologies
- Manufacturing
- Life Sciences
- Communications Infrastructure
- Security Systems

Employee-owned CH2M HILL is one of the world's leading consulting, design, design-build, operations, and programme management companies serving government, civil, industrial and energy clients, employing over 28,000 people worldwide. Our work is concentrated in the areas of water, transportation, environmental, energy, facilities and resources.

Having operated in the UK for over 20 years, we acquired Halcrow in 2011 and continue to base our European headquarters in London, now employing over 3,300 people in the UK. CH2M HILL is working on some of the most iconic infrastructure programmes including High Speed 2, Thames Tideway Tunnels, the decommissioning of Dounreay and was one of the leading partners in CLM, Delivery Partner to the ODA for the London 2012 Olympic & Paralympic Games.

We serve as a single point of contact and responsibility, managing your project through planning, financing, permitting, design, construction, and operations. We use technology transfer and leverage established relationships with local firms to deliver industrial and enterprise management solutions throughout the United Kingdom.

CH2M HILL is an active member of Business in the Community and the Employee Ownership Association.

Urban Programmes

Key endorsements:

"From the outset of the project, the Olympic Park has set new standards in sustainability, including delivery of lightweight venues, recycling or reuse of waste materials, using concrete with a high recycled content and delivering materials by rail or water. We have achieved new standards for a project of this size and scale and have raised the bar for the industry."
– John Armitt, ODA Chairman

"The ODA did a fantastic job in delivering the Olympic venues and infrastructure on time and within budget. They did our nation proud."
– Margaret Hodge MP, Chair of the Public Accounts Select Committee

London 2012 Olympic and Paralympic Games

CH2M HILL was one of the three first constituting the international consortium CLM, the Delivery Partner to the Olympic Delivery Authority (ODA). CLM oversaw the design and construction of the nine venues across the 500-acre Olympic Park for the London 2012 Olympic and Paralympic Games. CH2M HILL provided the consortium and ODA with global engineering, construction and programme management expertise.

Completed one year ahead of the games, the programme was delivered at an impressive £1Bn under the baseline budget of £7.2Bn with notably zero construction fatalities, the first of such records of any modern Olympics.

Water

Thames Tideway Tunnel and Lee Tunnel

CH2M HILL is the programme manager for the London Tideway Tunnels Programme, one of the biggest and most historic public works initiatives in London's history. With the Rivers Lee and Thames currently overflowing approximately 50-60 times annually, the London Tideway Tunnels Programme looks to reduce overflows to three or less per year.

The programme will see the construction of the Lee Tunnel and the Thames Tideway Tunnel and aims to greatly improve the river quality and reduce the environmental impact of sewerage overflows. Both tunnels will be more than seven metres wide, running beneath a vast network of existing tunnels, including six Underground lines and utilities. The programme includes constructing numerous collection and diversion facilities, a large high-head underground pumping station, and a major upgrade at Beckton sewage treatment works. Ultimately, CH2M HILL will manage over 300 work packages. So far, CH2M HILL have delivered £700M of savings on a £4.1Bn budget and carried out exemplary stakeholder relations across 14 London Boroughs.

Transport

Crossrail

As Europe's largest engineering project, Crossrail will connect 37 stations, including Heathrow airport and Maidenhead in the west with Canary Wharf, Abbey Wood and Shenfield in the east—reducing journey times across London while delivering extensive economic benefits.

The Transcend team, which includes CH2M HILL, AECOM and The Nichols Group, was appointed as the programme partner to work alongside Crossrail to oversee the construction of a 21 kilometre-long tunnel beneath central London, build eight new stations and integrate Crossrail with London's existing transport systems. Additionally, the team is responsible for programme controls, encompassing the functions of scope, cost and schedule control, as well as risk and value management.

When Crossrail opens in 2018, the £14.8Bn rail link will boost London's rail-based network capacity by ten percent—transporting 200 million passengers annually, bolster the capital's position as a world-leading financial center, and significantly reduce journey times across the city.

High Speed 2 (HS2)

HS2 will be the UK's new high speed rail network and is being designed and built to resolve impending capacity issues for both passengers and freight on existing routes, particularly the West Coast Main Line.

The network will provide enhanced infrastructure links between London and the West Midlands (Phase One), as well as the Channel Tunnel, expanding in future to connect Manchester, Leeds and the North with Birmingham, the south of England and Heathrow Airport (Phase Two).

CH2M HILL is development partner with HS2 Ltd and is leading the development of the next phase of engineering, design and environmental work on the London to the West Midlands line. The 80 strong team, working alongside HS2 Ltd, largely consists of project management and engineering specialists from the UK. The team project manage the professional services companies who are carrying out the design, environmental and land referencing work for the London to West Midlands line. CH2M HILL's expertise ensures that the work is fully integrated and delivered to the required quality.

On appointing CH2M HILL, HS2 Ltd's Chief Executive Alison Munro said: "The appointment means that we will have world class project managers and technical experts working alongside us to deliver the design, engineering and environmental work necessary for the hybrid bill. They will bring, in particular, their highly regarded experience of working on HS1 and Crossrail, two major UK infrastructure projects that have direct relevance to our work."

We provide services for your success

- Programme and Project Management
- Site Selection
- Infrastructure Planning
- Economic Development
- Energy Management and Planning
- Information Systems
- Master Planning
- Licensing and Permitting
- Management Consulting
- Project Financing
- Project Development
- Architecture and Programming
- LEED and BREEAM Facility Certification
- Civil, Structural, Mechanical, and Electrical Engineering

Water Resources-Ecosystem Management Services

Flood Risk Management

CH2M is a world leader in flood risk management, providing integrated and sustainable solutions for both the built and natural environment. Our large team of specialists and scientists, who are primarily based in the UK and USA, deliver projects around the world. They are supported by environmental scientists, surveyors, geotechnical engineers, and business planning, finance and contract, and other specialists. Our work includes the full cycle of flood risk mapping and strategic planning; capital works delivery; and operation, maintenance and asset management.

The solutions we develop recognize the effect climate change is increasingly having on the built and natural environment within river catchments and estuaries, and thus our focus is on developing long-term solutions that work with nature and continue to leave a sustainable legacy to protect future generations from the effects of climate change.

A core focus is delivering fully integrated solutions that maximize both direct and indirect benefits for the clients that we serve in WBG, T&G and Strategic Consulting. This means we are linked with several technologies including IWRM, Dams and Levees (Conveyance), Water Resilience, H&H modeling (Software Applications and Integration), Urban Watershed Management; and Coastal Planning and Engineering.

Sub-technologies

The FRM technology group has three key sub-technology areas that we steward, offering several capabilities in each:

Flood mapping and appraisal

- Watershed-scale flood risk management planning
- Flood hazard modeling/mapping and hydraulic analysis
- Flood risk management alternatives development and testing
- Risk vulnerability and damage analysis
- Flood forecasting/warning
- Flood incident management and exercise

Capital works delivery

- Program/project management
- Conceptual, preliminary and final design
- Contract preparation and administration
- Construction supervision
- Due diligence and other pre-bid assistance

O&M and asset management (AM)

- Asset management
- Strategic and tactical investment advice
- Disaster recovery

Challenges, Trends, Opportunities

Floods are increasing in frequency around the world and it is forecast that these will only get worse as a result of climate change. As the frequency of floods increases, the tolerance of the public, governments, the private sector, and insurance companies is reducing, prompting action.

A key market differentiator is being able to deliver multiple outcomes to clients through a river basin management approach which links together flood risk management needs with regeneration, recreational, and environmental enhancement opportunities and combines the associated available funding to generate both efficiencies and the financial support necessary for scheme delivery.

To achieve this we need to combine our flood risk management capabilities and technology with our knowledge of what the issues are within the river basins.

Did You Know?

- A review by the Organization for Economic Cooperation and Development on 136 coastal cities found that the estimated damage from sea level rise, storm surge and subsidence for 1 in 100 year flood event in 2070 was estimated at $35,000 billion.
- In 2070 it is estimated that over 150 million people will live in these 136 coastal cities at risk.
- River flooding is the most common type of flood event.
- Floods are the number one natural disaster in the US, and just a few inches of water from a flood can cause tens of thousands of dollars in damage.
- The flooding in Alberta, Canada in 2013 flooding displaced 100,000 people and is estimated to cost $6 billion.
- According to the House of Commons library, £2.34 billion has been spent on new flood defenses in England alone since 2011.

Low Crosby

Flood Investigation Report

Aerial photograph taken looking east from Carlisle

Photograph provided by Peter Smith. Taken 06/12/2015 11:00hrs

Flood Event 5th and 6th December 2015

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

Version	Prepared by	Reviewed by	Date
Draft for comment	Kevin Keating	XXXXX	23 June 2016
IL edits	Iwan Lawton		23/06/16

Contents

Executive Summary

Low Crosby experienced severe flooding on the 5th and 6th of December 2015 following Storm Desmond. This storm caused a period of prolonged, intense rainfall across Northern England, falling on an already saturated catchment, and led to high river levels and flooding throughout Cumbria and beyond. The flow in the River Eden on the 6th December was the highest flow in the data record dating back to the 1960's, with the previous high set in the January 2005 floods. Peak flows in the December 2015 event were 10% greater than those in 2005.

In response to the flood event, this Flood Investigation Report has been completed by the Environment Agency as a key Risk Management Authority (RMA) working in partnership with Cumbria County Council as the Lead Local Flood Authority, under the duties as set out in Section 19 of the Flood and Water Management Act 2010. This report provides details on the flooding that occurred in Low Crosby on 6th of December, and has used a range of data collected from affected residents, site visits, surveys of the area, and data collected by observers, along with river and rainfall telemetry during the flood event. This report also includes recommendations for future action.

Approximately 60 properties in Low Crosby and the surrounding area were flooded from the River Eden, when the existing flood defences were overtopped and outflanked. Flooding also occurred as a result of floodwater entering the village from the west along the line of Willow Beck where there are no flood defences. Overtopping of the defences occurred when the water level exceeded the height of the defence and flowed over the structures. Outflanking occurred when the river levels were high enough for water to flow around the furthest extent of the defended line. The flood event exceeded the design level of the existing flood defences within Low Crosby, however, no defences failed or collapsed. The defences may have been useful in delaying the onset of flooding, allowing residents additional time to prepare for the flood.

Eleven actions have been recommended in this report in order to improve future flood risk management. These will require the involvement of a number of organisations and local communities.

In response to the flooding, community meetings have taken place, and these will continue in order to ensure that all those affected are given the opportunity to be involved in reducing flood risk.

Any additional information that can be provided to the Environment Agency and Cumbria County Council to help develop our understanding of the flooding is welcomed. A lot of information has already been provided, much of which has been used to inform this report. Any additional information should be provided to;

http://www.cumbria.gov.uk/planning-environment/flooding/floodriskassessment.asp

Introduction

Under Section 19 of the Flood and Water Management Act (2010) Cumbria County Council, as Lead Local Flood Authority (LLFA), has a statutory duty to produce Flood Investigation Reports for areas affected by flooding. Section 19 of the Flood and Water Management Act states:

(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.

This section of the Act leaves the determination of the extent of flood investigation to the LLFA. It is not practical or realistic for Cumbria County Council to carry out a detailed investigation into every flood incident that occurs in the County, but every incident, together with basic details will be recorded by the LLFA.

Only those with 5 or more properties/businesses involved will have investigations published.
An investigation will be carried out, and a report prepared and published by the LLFA when the flooding impacts meet the following criteria:

- where there is ambiguity surrounding the source or responsibility of flood incident,
- internal flooding of one property that has been experienced on more than one occasion,
- internal flooding of five properties has been experienced during one single flood incident and
- there is a risk to life as a result of flooding.

As a flood Risk Management Authority (RMA), the Environment Agency have partnered with Cumbria County Council (CCC) to produce the 53 flood investigation reports across Cumbria.

Scope of this report

This Flood Investigation Report **is**:

- An investigation on the what, when, why, and how the flooding took place resulting from the 6th December 2015 flooding event and
- A means of identifying potential recommendations for actions to minimise the risk or impact of future flooding.

This Flood Investigation Report **does not**:

- Interpret observations and measurements resulting from this flooding event. Interpretation will be undertaken as part of the subsequent reports,
- Provide a complete description of what happens next.

The Flood Investigation Report outlines recommendations and actions that various organisations and authorities can do to minimise flood risk in affected areas. Once agreed, the report can be used by communities and agencies as the basis for developing future plans to help make the area more resilient to flooding in the future.

For further information on the “Section 19” flood investigations being completed throughout Cumbria following the flooding in December 2015, including a timetable of Flood Forum events and associated documentation, please visit the County Council website at:

http://www.cumbria.gov.uk/floods2015/floodforums.asp

To provide feedback on the report please email LFRM@cumbria.gov.uk.

Flooding History

Low Crosby is a village to the northeast of Carlisle and stands on the north bank of the River Eden. There are approximately 110 residential properties in Low Crosby itself. Due to its position and low lying topography the village is prone to flooding from the River Eden and other sources. In recent decades, Low Crosby has suffered serious flooding in 1968, 1995, 2005 and 2009.

The January 2005 event caused widespread flooding in Low Crosby and was estimated to be an event with a 0.6% Annual Exceedance Probability (AEP)*.

The AEP describes the likelihood of a specified flow rate (or volume of water with specified duration) being exceeded in a given year. There are several ways to express AEP as shown in Table 1. Throughout this report AEP is expressed as a percentage. As such an event having a 1 in 100 chance of occurring in any single year (0.01 probability) will be described as a 1% AEP event.

AEP (as percent)	AEP (as probability)
50%	0.5
20%	0.2
10%	0.1
4%	0.04
2%	0.02
1%	0.01
0.1%	0.001

Table 1-Probabilities of Exceedance

Partly in response to the flooding in 2005 event, a new defence scheme was constructed to reduce flood risk. The main component is a 500m long earth embankment to the east of Low Crosby. This scheme included a sump chamber designed to accommodate a pump. This was constructed due to the history of surface water flooding and drainage problems experienced in the village. When the River Eden is in flood the highways and surface water drainage systems cannot discharge freely and require a pumped discharge to operate effectively. CCC are installing a permanent pump at this location this financial year.

It should be noted that the 2015 flood level on the River Eden was 0.6m higher than in 2005. Indeed, the 2015 event was of significantly greater magnitude than past events and the flow in the River Eden was the highest recorded.

Flooding Event	Number of Properties Flooded	Peak Flow in River Eden at Sheepmount (m^3/s)†	Peak Flow in River Eden at Warwick Bridge (m^3/s)	Peak Flow in River Eden at Great Corby (m^3/s)	Peak Flow in River Irthing at Greenholme (m^3/s)
March 1968	Unkown	1200*	1104	-	189
Febuary 1995	Unknown	950	812	-	26
January 2005	>60	1516	-	1373	205
November 2009	5	1029	-	816	198
December 2015	>58**	1680	-	1490	229

*based on an extrapolation, not directly from recorded data at this gauging station. **58 in Low Crosby and more nearby.

* 2007 Viability Study by Jacobs

† Flows for past events taken from CEH National River Flow Archive http://nrfa.ceh.ac.uk/data/search

Table 2 -Recent flood events affecting Low Crosby

Event background

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

Flooding Incident

Low Crosby is a village to the north east of Carlisle and stands on the north bank of the River Eden. There is also a small watercourse called Willow Beck that drains land north of Low Crosby, discharging into the River Eden, west of Low Crosby. Willow Beck skirts the north and western sides of the village. Low Crosby is located on the former Stanegate Roman road and Hadrian's Wall passes approx. 2km to the north, with Hadrian's Wall Path located within the village. It is small residential community, with no large commercial entreprises.

On 6th December 2015, approximately 60 properties in Low Crosby suffered internal flooding as a result of Storm Desmond. Further flooding of property also occurred in surrounding rural areas (e.g. Warwick Holmes and Newby Grange). This storm caused 36 hours of intense rainfall leading to high river levels that overtopped and outflanked flood defences. The main source of the local flooding is attributed to the River Eden, rather than Willow Beck. The River Eden flowed up the course of Willow Beck, entering the western side of the village along Willow Beck's left hand bank. The area affected by the flooding is shown in Figure 1.

Figure 1- Extent of River (Fluvial) Flooding* in Low Crosby on 5-6th December 2015

*The flood outline identifies the maximum extent of flooding. Not all properties within the extent area were flooded.

The extent of the flooding was greater than that in 2005, with more penetration within the village, particularly on the west / south west side.

Figure 2- Aerial View of the Flood Extent at Low Crosby and Warwick Holmes (view looking west)

Existing Flood Defences

There are embankments that reduce flood risk to both the north and south side of the River Eden at Low Crosby, as shown in Figure 3. Natural features also provide flood risk reduction benefit and numerous properties within Low Crosby have had property level protection installed (with limited success), with a supporting automated telephone flood warning service provided by the Environment Agency.

The flood embankment to the east of Low Crosby was constructed in 2011-12, partly in response to the flooding in 2005. It includes approximately 500m of raised embankment, typically 1.5m high. It also includes an area of raised road (to provide continuity of the standard of protection provided) and a sump / chamber to allow deployment of a mobile pump. The scheme ties into higher ground to the south and the A689 road embankment to the north. The scheme was designed to provide protection from flood events on the Eden up to a 1% Annual Exceedance Probability, with a minimum crest level of +19.1mOD* at the raised road areas and +19.4mOD along the embankment (the latter appears to include a 300mm freeboard allowance for settlement etc.).

There are also three lengths of long standing embankments on the banks of the River Eden.

The embankment on the north bank, immediately upstream of Low Crosby offers some protection to a golf course and scattered residential properties and farms. The standard of protection offered is estimated as 10% Annual Exceedance Probability, with embankment crest elevations varying from +18.2mOD near Low Crosby and increasing to +18.6mOD near the sewage tratment works.

The flood embankment on the south bank directly south of Low Crosby (the Warwick Holmes flood defence) reduces flood risk to agricultural land, farm buildings and several residential properties. Historically, this defence was maintained by the Environment Agency and its predecessors. However, In 2008-09, the Environment Agency and the local landowner agreed that the defence would be maintained by the landowner in future. As part of this agreement, the Environment Agency refurbished sections of the embankment prior to responsibility being transferred. A recent topographic survey shows the crest of this defence directly south of Low Crosby to be at approx. +19.0mOD, increasing upstream and decreasing downstream.

The flood embankment on the north bank of the Eden, downstream of Low Crosby, follows the line of the Hadrian's Wall Footpath. The crest elevation is approximately +17.5mOD, most probably offering the lowest level of protection of any of the local embankments. For example, the crest level of the embankment opposite, protecting Warwick Holme, is +18.1mOD at this location.

There are currently no formal upstream flood storage schemes that provide benefit to Low Crosby. However, there are initiatives within Cumbria examining the viability of reducing flood conveyance within the River Eden catchment. This includes work within the "Slow the Flow" initiative and that by the "Cumbria Floods Partnership".

There are no flood defences to the west of the village around Green Lane or along the course of Willow Beck.

* All topographic levels quoted in this section are based on a survey completed in June 2016

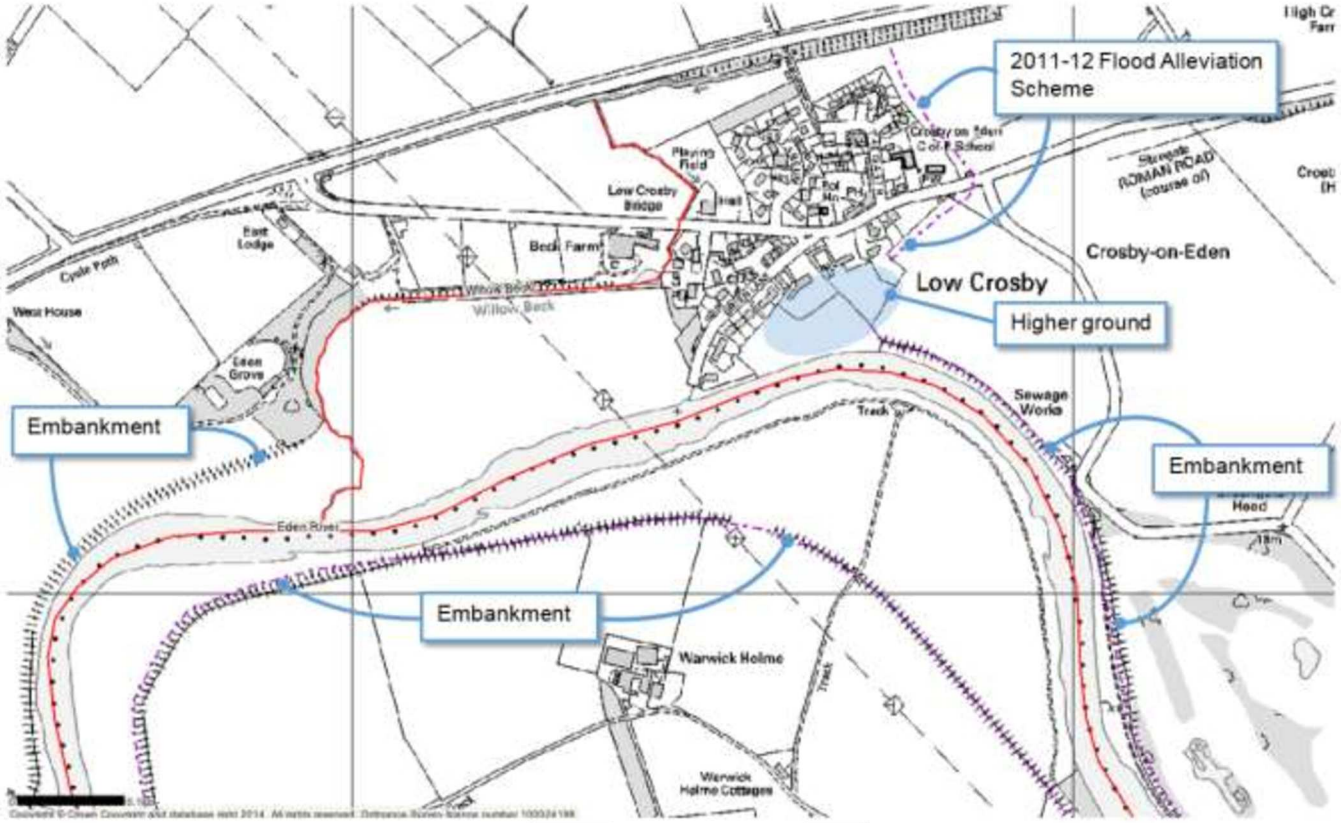


Figure 3-Flood Defences at Low Crosby

Investigation

This section provides details of the rainfall event and the likely local causes of flooding. This investigation was carried out by the Environment Agency through surveys of the area and data collected from the community affected. This report has compiled this data to provide details of the flooding within Low Crosby.

Rainfall and Fluvial Flow Event

December 2015 was the wettest calendar month on record for the UK, with much of northern England receiving double the average December rainfall. This also followed a particularly wet November and as such, much of the ground within the Cumbria catchments was already saturated.

From the 4th to the 7th of December there was a period of prolonged, intense rainfall caused by Storm Desmond. Over this period, new 24 hour and 48 hour rainfall records were set for the UK. Both of these were within Cumbria and broke the previous records, also within Cumbria, set during the November 2009 floods.

Table 3 shows the record levels of rainfall that fell prior to the flooding event. Table 4 shows the rainfall more widely recorded over the catchment on the 4th and 5th December 2015. Figure 5 shows the location of these rain gauges around Low Crosby.

	Previous record November 2009		Current Record December 2015	
	Location	**mm**	**Location**	**mm**
24 hour rainfall	Seathwaite	316.4	Honister Pass	341.4
48 hour rainfall	Seathwaite	395.6	Thirlmere	405

Table 3 - UK Rainfall Records*

Return periods (calculated using historical rainfall event data) have been calculated for this event. Two of these locations have recorded rainfall that is estimated to be more extreme than 0.1% AEP.

* Taken from met office – www.metoffice.gov.uk/public/weather/climate-extremes http://www.metoffice.gov.uk/climate/uk/interesting/nov2009

Location	24 hour Rainfall during November 2009 Event	24 hour Rainfall during December 2015 Event	
	mm	mm	Estimated AEP
Scalebeck	60.8	147.6	0.2% to 0.1%
Skelton	42.2	137.8	<0.1%
Brotherswater	200.8	293.4	<0.1%
Aisgil	61.2	105.7	20% to 5%

Table 4 - Rainfall over 24 hours in the Eden catchment prior to the December 2015 event

Figure 4 - Location of Local Rain Gauges

There are a number of river monitoring gauges near Low Crosby measuring river flow and water level. The locations of these are shown in Figure 5.

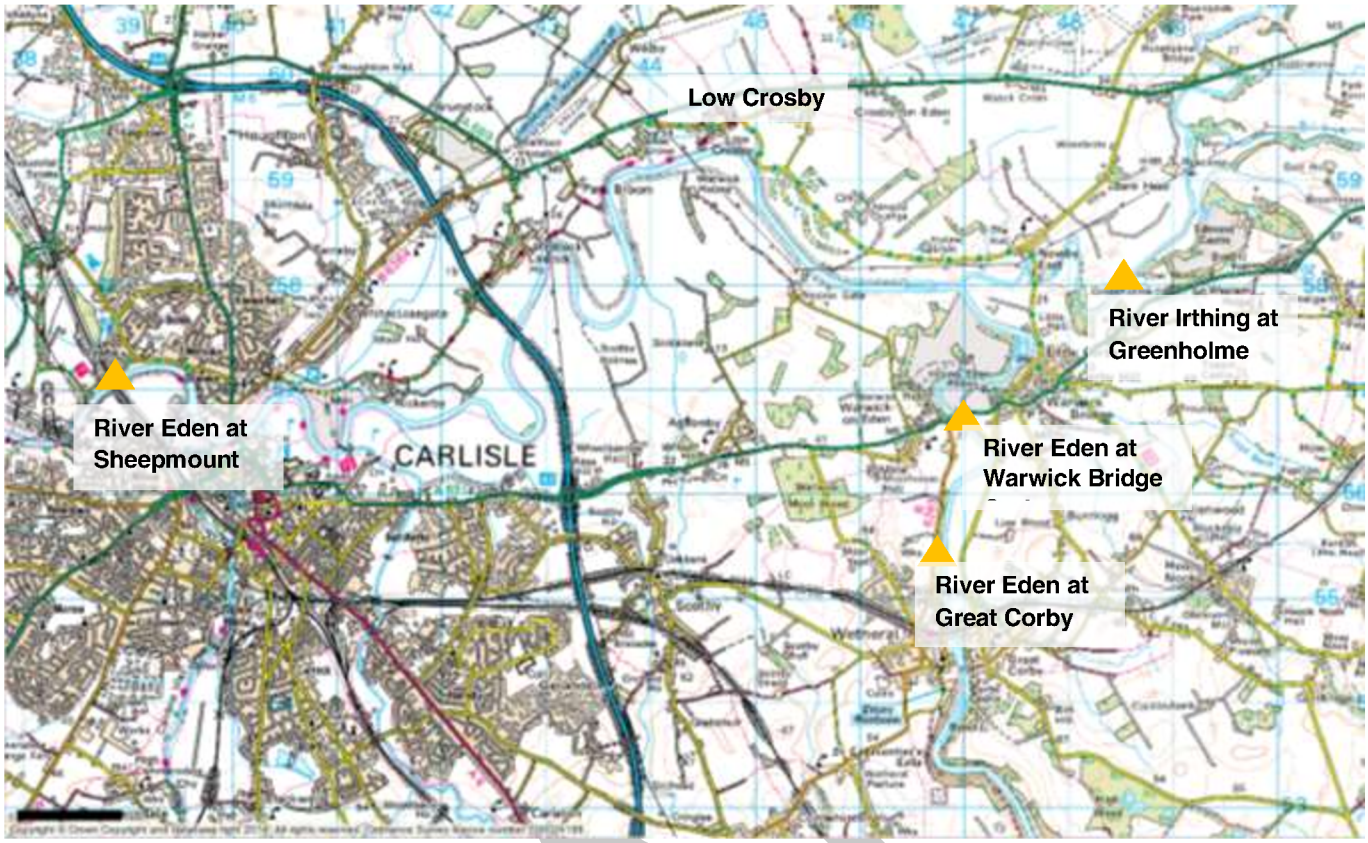


Figure 5 - Location of River Gauges Near Low Crosby

Table 5 shows the peak flows recorded at these gauging stations.

Gauging Station	River	Peak flow (m3/s)					Estimated AEP of Dec 2015 event
		Dec 2015	Past events				
			March 1968	Feb. 1995	Jan. 2005	Nov. 2009	
Sheepmount	Eden	1680	1200*	950	1516	1029	0.16%
Warwick B.	Eden	-	1104	812	-	-	-
Great Corby	Eden	1490	-	-	1373	816	0.17%
Greenholme	Irthing	229	189	26	205	198	5.9%

*based on an extrapolation, not directly recorded data at this gauging station

Table 5 - Flows recorded at the gauging stations

All gauges on the River Eden recorded the highest flow rates on record. In the case of the Sheepmount gauge, the records began in 1967. While the December 2015 event was certainly extreme, it should be noted that the estimation of the exact rarity of extreme flood events is subject to a significant degree of uncertainty. This is mainly due to the relatively brief period over which data has been recorded. However, it seems likely that this flood event was of a greater magnitude than that which the 2011-2012 scheme was designed to protect against (1% AEP).

Figure 6 shows the recorded river flows at the three "live" monitoring gauges from the 5th to the 7th of December 2015. This illustrates the relative size of the two rivers and the times of peak flow during the flood event.

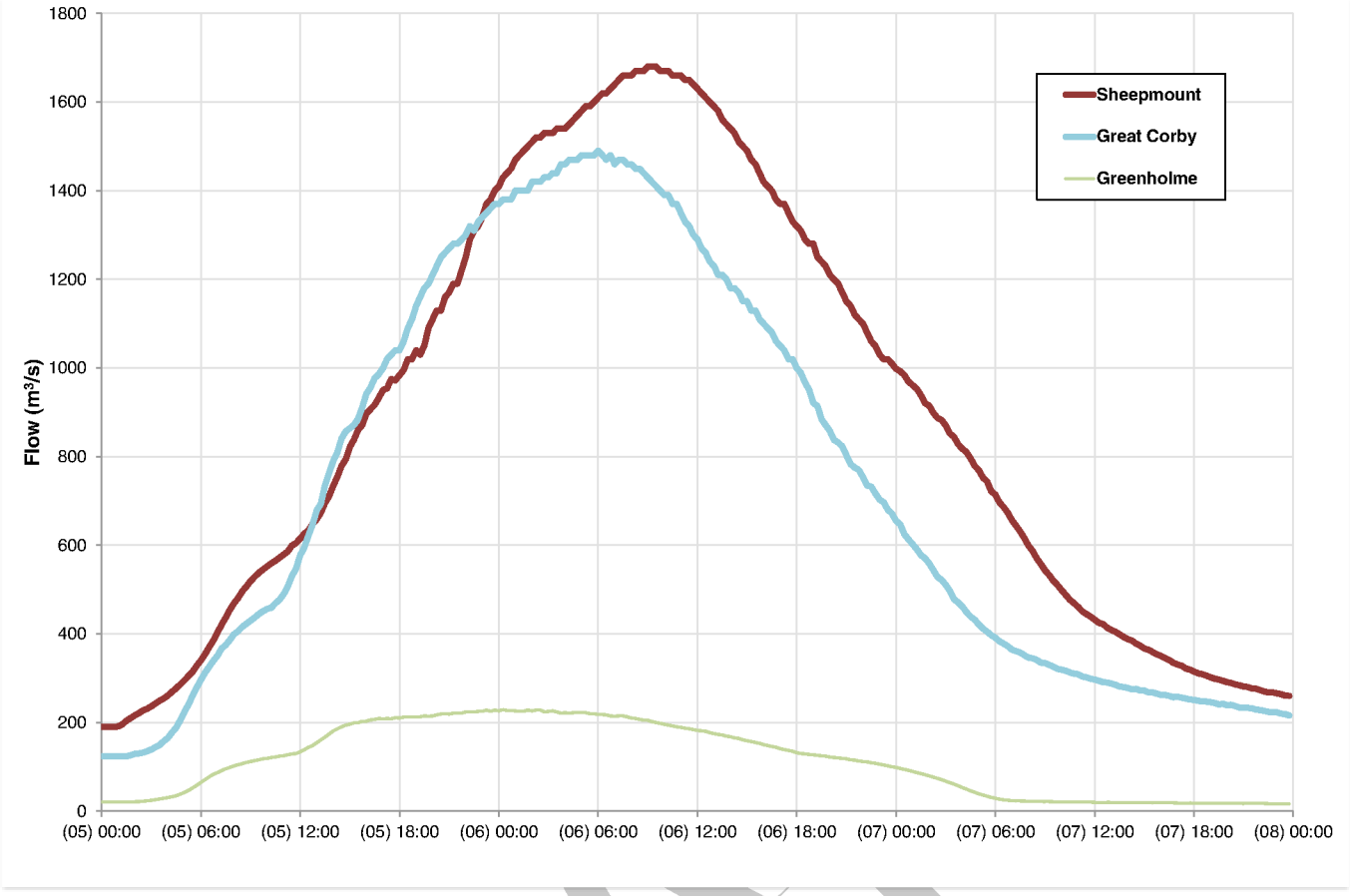


Figure 6 – River Flows Near Low Crosby

Sources of Flooding, Flow Routes and Event Timing

There were two main flood flow routes in Low Crosby during the event, as shown in Figure 7.

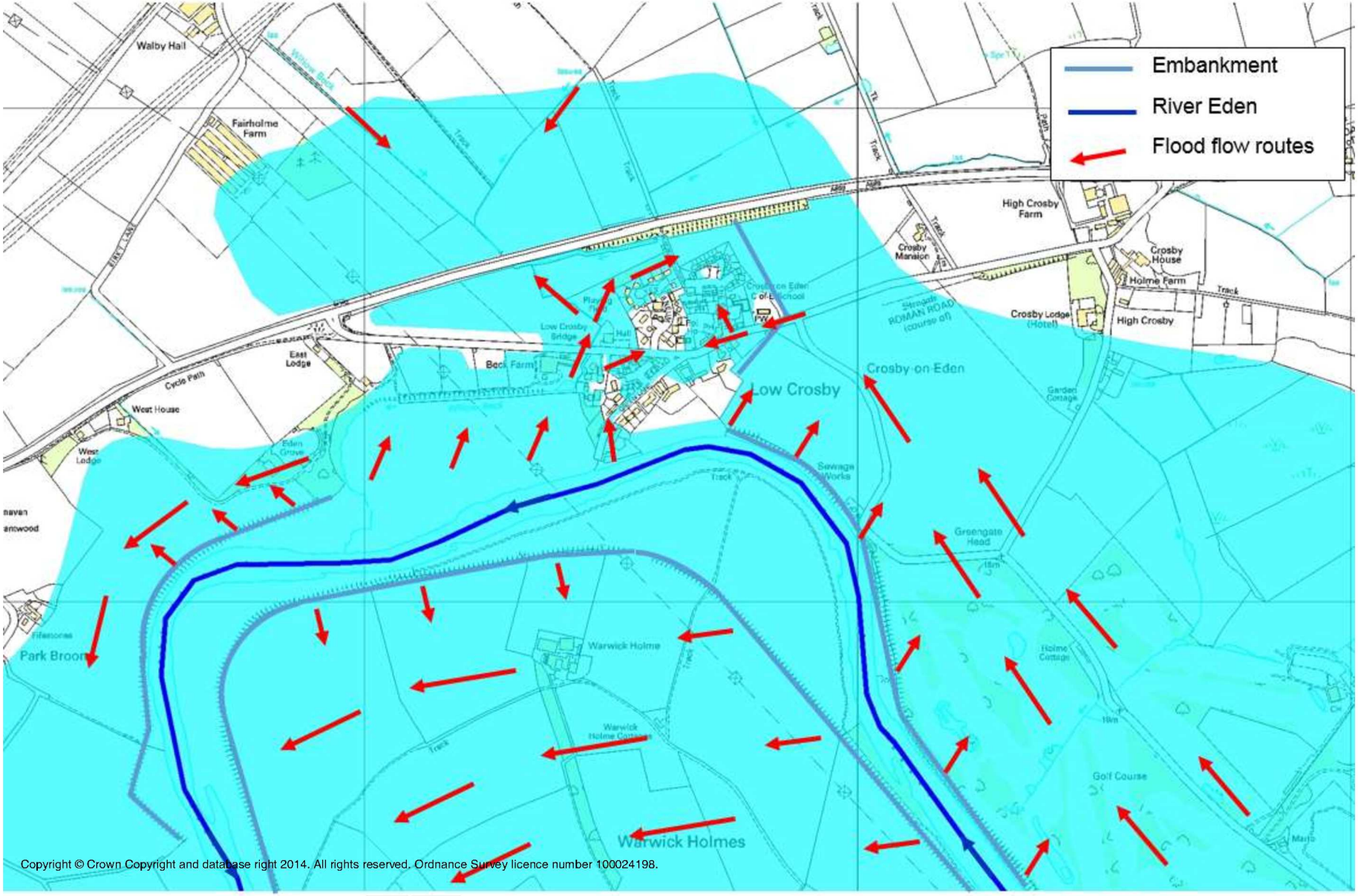


Figure 7 - Map of flood flow routes

Note: The flood outline identifies the maximum extent of flooding. Not all properties within the extent area were flooded.

Table 6 below shows the times of key events during the flooding in December 2015.

Thurs 3rd December	**Event**
14:46	**Flood alert** issued for the Lower Eden, incl. Low Crosby.
Saturday 5th December	**Event**
05:26	**Flood warning** issued for Low Crosby, Eden Golf Course area.
16:49	**Flood warning** issued for Warwick Holmes area.
17:41	**Flood warning** issued for at Low Crosby Village, Holme Ends and Holme Gate area.
18:00	Flooding to Barn End (south end of Green Lane) from River Eden – flow route onto Green Lane
TBC	Progressive overtopping of the embankment protecting Warwick Holme area
18:00 onwards	Progressive flooding to the village from the west side along the general line of Willow Beck and outflanking the new flood defences on the east side of Low Crosby.
22:00 onwards	Flood water starts to over top the raised section of Main Street flood defences near Church at the road junction with Newby East Road at 22:00 hrs. Flood waters will have joined with flooding of The Garth from the north / west, worsening existing flooding in The Garth and also flooding properties on Main Street.
23:30	Properties in Warwick Holmes evacuated
Sunday 6th December	**Event**
00:12	**Severe flood warning** issued for Low Crosby and Warwick Holmes areas.
06:00	Peak flow on River Eden reached at Great Crosby gauging station.
09:00	Peak flow on River Eden reached at Sheepmount gauging station.

Table 6 - Timeline of Key events

Likely Causes of Flooding

The cause of the flooding was clear: high fluvial flows and water levels in the River Eden. This was the dominant feature dictating the extent and depth of flooding.

The general pattern flooding is also clear and is described below:

- Water levels in the Eden rose during Saturday 5th December and Sunday 6th December. Embankments will have been subject to overtopping with those offering the lowest standard of protection being overwhelmed first. Although no records exist for this, it is expected that the defences running along the north bank of the Eden, upstream and downstream of Low Crosby, will have been overtopped first, followed by the defences to Warwick Holmes. The overtopping will have occurred at various low spots, with the hinterland areas gradually filling.

- Prior to the direct flooding from the River Eden there were reports of flooding from the drainage system at The Garth and elsewhere in the village. High river levels prevent the local drainage systems from operating effectively. A temporary pump was operated by CCC at the sump in the flood defences opposite the church which helped to manage flooding from local drainage systems at certain locations early in the event.
- During this period, floodwater from the River Eden gradually filled the floodplain and channel associated with Willow Beck, west of Low Crosby. Once sufficiently elevated, this floodwater spilled across the floodplain north of Low Crosby. Based on the available information, this flow route accounted for all 18 of the properties flooded in Green Lane, the 2 on Primrose Bank, and potentially some of the 30 properties flooded in The Garth, especially at the northern end. It is not possible to provide exact timings of flooding.
- Lastly, flood waters overtopped a short section of the new 2011-12 defence to the east of Low Crosby (on the highway), occurring at approximately 22:00hrs. This is the likely route by which 8 properties on Main Street were flooded and the balance of the properties in The Garth. However, this assessment would benefit from specific consultation with the relevant property owners as the properties may have suffered flooding (from the above flow routes) prior to the 2011-12 defence being overtopped, with the further floodwaters from the east only adding to the problem. Inspections shortly after the event appear to show that the flood level reached the crest of the 2011-12 embankment but did not overtop it. This indicates a maximum depth of floodwater of 200~300mm flowing over the highway low spot in the defence. This also provides a basis for assessing the peak flood level reached in the flooded area east of Low Crosby, being approximately 19.3~19.4mOD (19.4mOD being the level of the embankment crest).

The exact timings and mechanisms (flow routes) by which the flooding reached individual properties is subject to some uncertainty and would benefit from more detailed and structured consultation with the local community.

Flood Incident Response

A flood alert for the River Eden catchment was issued on 3rd December at 14:46hrs by the Environment Agency. This was followed by the issue of a flood warning on 5th December (at 16:49hrs for the village) and a severe flood warning in the early hours of Sunday 6th December. The community at Low Crosby and the surrounding area is well covered by the Environment Agency's "Floodline Warnings Direct" automated telephone based flood warning service. Of note, 75% of calls made providing the severe flood warning were successful (i.e. were answered).

During the flood event Cumbria County Council operated a mobile pump in the sump chamber that was constructed as part of the Environment Agency flood defence scheme around the eastern and southern part of the village. This helped keep water levels and the drainage system in the eastern part of village lower for longer but the pump was overwhelmed once the flood defence began to overtop later in the flood event.

The actions of other emergency services are not known with certainty but it is thought likely that there were no specific presence or actions that benefitted the local community.

In the period to date following the event:

- The Environment Agency has visited the local community to complete initial consultation with local residents and collect information related to the extent of flooding.
- The Environment Agency has completed a topographic survey of all local raised defences (mainly embankments).
- Cumbria County Council have undertaken;

  - Gulley emptying
  - De-silting and jetting connecting pipework to outfalls
  - Survey and mapping highways drainage system. This includes identification of any defects which will be inform programme of additional works
- Connect Roads who maintain the A689 on behalf of Highways England have confirmed that they will be undertaking an inspection of the culverts running underneath the A689 shortly.

Maintenance Activities

The Environment Agency maintains flood risk management structures and sections of river channel where maintenance actively reduces the risk of flooding to people and property. Local activities undertaken around Low Crosby are summarised below:

- Yearly visual inspections of flood defence embankments and walls and delivery of a variety of maintenance tasks which include, as necessary:
  - grass cutting,
  - tree and bush management,
  - invasive species control,
  - vermin control and
  - expansion joint repairs.

The Environment Agency also undertakes yearly inspections of river channels and targeted debris clearance when the debris increases the risk of flooding.

Recommended Actions

The following table details recommended actions for various organisations and members of the public to consider. Some of these recommendations may have already been carried out.

Cumbria Flood Partnership Theme	Action By	Recommended Action	Time line
Strengthening Defences	Cumbria Country Council	Install permanent pump in chamber on Environment Agency flood defences at church in Low Crosby installed and operational	August / September 2016
	Environment Agency, County Council, Landowners	Review flood risk and it present management at Low Crosby and Warwick Holmes and work with the local community (e.g. Flood Action Group and landowners) to explore options to further reduce flood risk. This should include;	
		• Develop business case for new flood defences on the west side of Low Crosby.	• From September 2016
		• examining the performance of the 2011-12 flood defence scheme	• Summer '16
		• How the Warwick Holmes and other rural raised defences influence flood risk in Low Crosby	• Summer '16
		• the possibility of using land north of the A689 as additional storage	• Summer '16
		• consideration of how high river levels interact with the local drainage systems.	• Summer '16
Community Resilience	Environment Agency	Adopt a precautionary approach when considering development proposals.	Ongoing
	County Council and District Council	Review Local Development Plans and Strategic Flood Risk Assessment to reflect current understanding of flooding.	2016
	County	Review emergency planning and	2016

Cumbria Flood Partnership Theme	Action By	Recommended Action	Time line
	Council, District Council, Local Residents	response arrangements, including road closures and evacuation procedures. The latter point is particularly important given the potential for the village to be cut off in flood events. The local Flood Action Group and Parish Council will be important in such efforts. Clarity on "delegated responsibility" to the local community during flood events would be appropriate.	
	Environment Agency, County Council	Partly linked to better emergency planning, education / awareness raising to ensure that the local community is made aware of the hazards posed by flood water and how to respond to flood warnings.	2016
	Environment Agency, County Council	Promote further take up of property level flood resilience and resistance technology.	2016
	Environment Agency	Ensure all properties at risk can register to receive flood warnings and details are up-to-date.	2016
Maintenance	Environment Agency	Review modelling and forecasting data to ensure that models for the Eden catchment reflect real conditions as accurately as possible and use this information to make any improvements to the flood warnings service. This modelling review will be used to inform future investment plans.	Summer '16
	Connect Roads (Highways England)	Inspect culverts on A689 Low Crosby By-pass	2016
	Environment Agency	Complete on-going inspections and repairs to assets that may have been damaged during the flood event. Includes topping up low spots in existing flood defence embankment at church	September 2016

Table 7-Recommended Actions

Next Steps

The Cumbria Floods Partnership has brought together a wide range of community representatives and stakeholders from a variety of sectors to plan and take action to reduce flood risk. The Cumbria Floods Partnership, led by the Environment Agency, is producing a 25 year flood action plan for the Cumbrian catchments worst affected by the December 2015 flooding.

The plan will consider options to reduce flood risk across the whole length of a river catchment including upstream land management, strengthening flood defences, reviewing maintenance of banks and channels, considering water level management boards, and increasing property resilience. The Cumbria Floods Partnership structure below details how these 5 themes are being delivered in the Flood Action Plans which will be completed in July 2016.

The 'Cumbria Floods Partnership' was set up by Flood Minister Rory Stewart MP following December's floods, and includes all of Cumbria's Flood Risk Management Authorities. They are working alongside the existing 'Cumbria Strategic Partnership', which was formed as part of the Flood and Water Management Act 2010 and comprises of the County's Flood Risk Management Authorities (RMAs) including the Environment Agency, Cumbria County Council, Local Authorities, and United Utilities. Both partnerships are working with communities, businesses, and relevant stakeholders to understand and reduce flood risk across Cumbria.

Figure 19 below helps demonstrate how the two partnerships are working together:

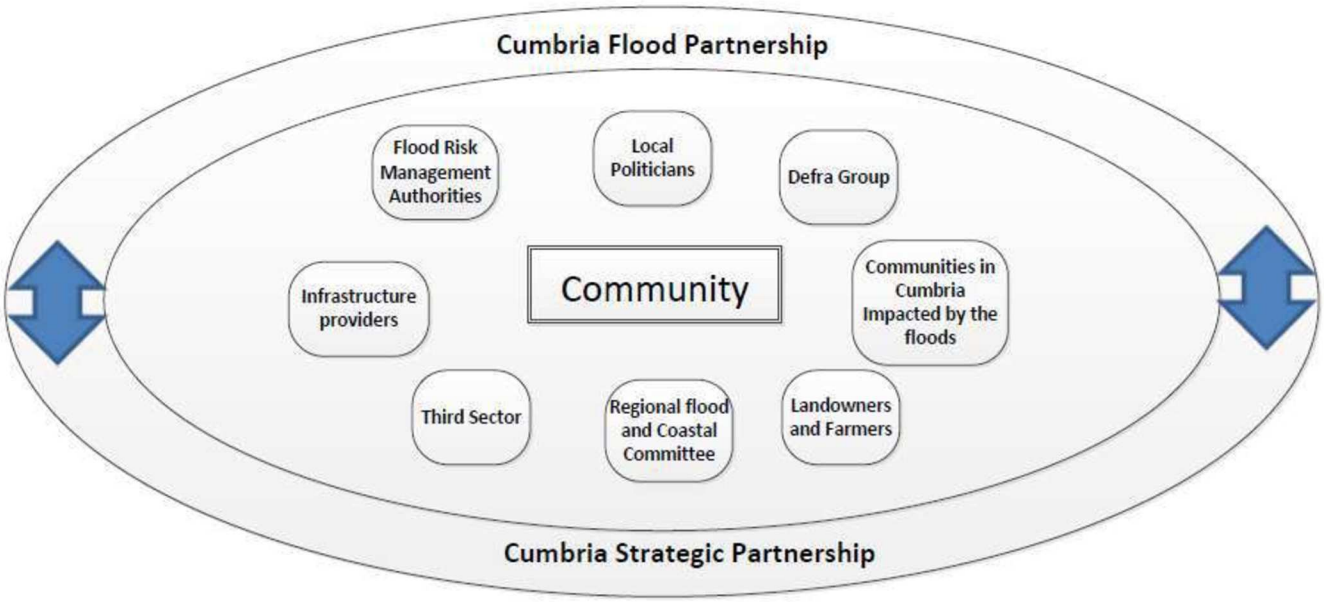


Figure 8-Cumbria Flood Partnership and Cumbria Strategic Partnership

Appendices

Appendix 1: Glossary

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
CCC	Cumbria County Council
CFP	Cumbria Floods Partnership
EA	Environment Agency
FAG	Flood Action Group
FWD	Flood Warnings Direct
LLFA	Local Lead Flood Authority
MsfWG	Making space for Water Group

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

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 the LLFA'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 (RMA's). 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 under the Flood & Water Management Act 2010. 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 RMA 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 RMA's to maximise knowledge of flood risk to all involved. This function is carried out at CCC by the Development 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. These organisations are classed as RMA's.

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. These organisations are classed as RMA's

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. These organisations are classed as RMA's

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 capital programme 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: Links to Other Information on Flooding

Sign up for Flood Warnings
https://www.gov.uk/sign-up-for-flood-warnings

Environment Agency – Prepare your property for flooding; a guide for householders and small businesses to prepare for floods
https://www.gov.uk/government/publications/prepare-your-property-for-flooding

Environment Agency – What to do before, during and after a flood: Practical advice on what to do to protect you and your property
https://www.gov.uk/government/publications/flooding-what-to-do-before-during-and-after-a-flood

Environment Agency – Living on the Edge: A guide to the rights and responsibilities of riverside occupiers
https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

Environment Agency – Flood risk maps
https://www.gov.uk/prepare-for-a-flood

Environment Agency – Programme of flood and coastal erosion risk management schemes
https://www.gov.uk/government/publications/programme-of-flood-and-coastal-erosion-risk-management-schemes

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

Appendix 4: Flood Warnings and Alerts

Low Crosby and Warwick Holmes are covered by a Flood Alert and Flood Warning service.

Flood Alert for the Lower River Eden (for Low Crosby):

- **011WAFLE- Lower River Eden**

Alert issued on Thursday 03/12/2015 at 14:46
Alert removed on Sunday 13/12/2015 at 10:20

Customers in Flood Alert area registered on FWD: 332
Contacts (landline, mobile, email etc) in Flood Alert area registered on FWD: 1051
Successful contacts: 911
Unsuccessful contacts: 140

Alert Message:

A Flood Alert has been issued by the Environment Agency for the Lower River Eden.
Flooding is possible for River Eden and its tributaries from its confluence with the River Irthing through Crosby-on-Eden and Carlisle to the Solway Firth at Rockcliffe.

Low lying land and roads will be affected first. Be prepared to protect yourself, family, pets and property. Heavy and persistent rainfall is forecast to continue throughout today until this evening. With the ground already saturated the river levels are expected to rise and we may see some localised flooding to low lying land and roads. An outlook for the weekend shows although Friday is looking a relatively dry day, the rain will again become heavy and persistent in the early hours of Saturday continuing right through until Sunday. As River levels are already high, we may see some localised flooding throughout Cumbria.

Flood Warnings for Low Crosby

- **011FWFNC11A- River Eden at Low Crosby, Eden Golf Course Area**

Flood Warning issued on Saturday 05/12/2015 at 05:26
Severe Flood Warning issued on Sunday 06/12/2015 at 00:12
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:49

Date/Time Warning Level Reached: 05/12/2015 13:30
Time customers had to take action: 08:03:20
Customers in Flood Warning area registered on FWD: 39
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 125
Successful contacts: 93
Unsuccessful contacts: 32

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Low Crosby, Eden Golf Course Area.

Flooding is expected for Low lying roads, agricultural land, isolated properties and the golf course adjacent to the River Eden near Low Crosby. Immediate action required.

Heavy and persistent rainfall is expected throughout Saturday. River levels will continue to rise and further Flood Warnings are likely. Please check for updates throughout the weekend. Operational Teams have closed flood defences and are checking watercourses for blockages.

- **011FWFNC11B- River Eden at Low Crosby, Warwick Holmes Area**

Flood Warning issued on Saturday 05/12/2015 at 16:49
Severe Flood Warning issued on Sunday 06/12/2015 at 00:12
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:46

Date/Time Warning Level Reached: 05/12/2015 19:15
Time customers had to take action: 02:25:53
Customers in Flood Warning area registered on FWD: 34
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 115
Successful contacts: 88
Unsuccessful contacts: 27

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Low Crosby, Warwick Holmes Area.

Flooding is expected for Low lying roads, agricultural land and isolated properties adjacent to the River Eden in the Warwick Holmes area. Immediate action required.

Heavy and persistent rainfall is expected throughout Saturday. River levels will continue to rise and further Flood Warnings are likely. Please check for updates throughout the weekend. Operational Teams have closed flood defences and are checking watercourses for blockages.

- **011FWFNC11C- River Eden at Low Crosby Village, Holme Ends and Holme Gate**

Flood Warning issued on Saturday 05/12/2015 at 17:41
Severe Flood Warning issued on Sunday 06/12/2015 at 00:12
Severe Flood Warning removed on Tuesday 08/12/2015 at 16:48

Date/Time Warning Level Reached: 05/12/2015 20:45
Time customers had to take action: 03:03:12
Customers in Flood Warning area registered on FWD: 188
Contacts (landline, mobile, email etc) in Flood Warning area registered on FWD: 435
Successful contacts: 332
Unsuccessful contacts: 103

Warning Message:
A Flood Warning has been issued by the Environment Agency for the River Eden at Low Crosby Village, Holme Ends and Holme Gate.

Flooding is expected for Low lying roads, agricultural land and properties in Low Crosby Village, Holme Ends and Holme Gate. Immediate action required.

Heavy and persistent rainfall is expected throughout Saturday. River levels will continue to rise and further Flood Warnings are likely. Please check for updates throughout the weekend. Operational Teams have closed flood defences and are checking watercourses for blockages.

Appendix 5: Detailed Information on Flooding

Warwick Bridge

Flood Investigation Report

Flood extent at Warwick Bridge on the 6th December 2015

Flood Event 5-6th December 2015

This flood investigation report has been produced by the Environment Agency as a key Risk Management Authority under Section 19 of the Flood and Water Management Act 2010, in partnership with Cumbria County Council as Lead Local Flood Authority.

Version	Prepared by	Reviewed by	Approved by	Date
Working Draft for discussion	David Webborn	Iwan Lawton, EA		22nd June 2016

Executive Summary

Warwick Bridge experienced significant flooding on the 5th and 6th of December 2015 following Storm Desmond. This storm caused a period of prolonged, intense rainfall across Northern England. This rainfall fell on catchments that were already saturated and resulted in high river levels and flooding throughout Cumbria and beyond. The flows in the River Eden on the 5th & 6th of December were the highest ever recorded, even higher than 2005.

In response to the Storm Desmond flood event, this *Flood Investigation Report* has been completed by the Environment Agency as a key Risk Management Authority (RMA) working in partnership with Cumbria County Council (CCC) as the Lead Local Flood Authority (LLFA), under the duties set out in Section 19 of the Flood and Water Management Act 2010. This report provides a summary of the flooding that occurred at Warwick Bridge on the 5th and 6th of December, and to do so it has used a range of data collected from affected residents, professional partners, site visits, surveys and general observations, along with river and rainfall telemetry data recorded during the event.

A total of 42 properties were directly affected by flooding, with the majority of these located close to the centre of the village. The principle source of flooding was from the River Eden near Warwick Bridge with flood waters flowing over and along the A69, across Downagate Community playing fields before joining flood flows from the River Eden and Cairn Beck on Little Corby Road. There were also reports of surface water flooding on the A69 and Little Corby Road.

Please note that references to left and right hand bank are taken looking downstream with the flow of the water.

A number of actions have been recommended in this report, which will require the involvement of a number of organisations as well as from local communities. One of the main actions is to review the case for flood defences in Warwick Bridge. This review will also incorporate 'quick wins' to address some of the specific issues in the village and will aim to provide a 'joined-up' approach to flood risk management improvements in the Eden catchment as a whole.

In response to the flooding, a number of community meetings have taken place, and these will continue in order to ensure that all those affected are given the opportunity to be involved in helping to mitigate flood risk in Warwick Bridge.

Any additional information that can be provided to the Environment Agency and Cumbria County Council to help develop our understanding of the flooding is welcomed. A lot of information has already been provided, much of which has been used to inform this report. Any additional information should be provided to;

http://www.cumbria.gov.uk/planning-environment/flooding/floodriskassessment.asp

Contents

Introduction

Under Section 19 of the Flood and Water Management Act (2010) Cumbria County Council, as Lead Local Flood Authority (LLFA), has a statutory duty to produce Flood Investigation Reports for areas affected by flooding. Section 19 of the Flood and Water Management Act states:

(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.

This section of the Act leaves the determination of the extent of flood investigation to the LLFA. It is not practical or realistic for Cumbria County Council to carry out a detailed investigation into every flood incident that occurs in the County, but every incident, together with basic details will be recorded by the LLFA.

Only those with 5 or more properties/businesses involved will have investigations published.

An investigation will be carried out, and a report prepared and published by the LLFA when the flooding impacts meet the following criteria:

- Where there is ambiguity surrounding the source or responsibility of flood incident,
- Internal flooding of one property that has been experienced on more than one occasion,
- Internal flooding of five properties has been experienced during one single flood incident and
- There is a risk to life as a result of flooding.

As a flood Risk Management Authority (RMA), the Environment Agency have partnered with Cumbria County Council (CCC) to produce the 53 flood investigation reports across Cumbria.

Scope of this Report

This Flood Investigation Report **is**:

- An investigation on the what, when, why, and how the flooding took place resulting from the 5th-6th December 2015 flooding event and
- A means of identifying potential recommendations for actions to minimise the risk or impact of future flooding.

This Flood Investigation Report **does not**:

- Interpret observations and measurements resulting from this flooding event. Interpretation will be undertaken as part of the subsequent reports,
- Provide a complete description of what happens next.

The Flood Investigation Reports outline recommendations and actions that various organisations and authorities can do to minimise flood risk in affected areas. Once agreed, the reports can be used by communities and agencies as the basis for developing future plans to help make areas more resilient to flooding in the future.

For further information on the S19 process, including a timetable of Flood Forum events and associated documentation, please visit the County Council website at:

http://www.cumbria.gov.uk/floods2015/floodforums.asp

To provide feedback on the report please email **LFRM@cumbria.gov.uk**.

Flooding History

Warwick Bridge and Warwick-on-Eden are located on the River Eden, which is the largest river in north-west England. Upstream of the former Warwick Bridge gauging station, the River Eden drains a catchment area of over 1,300km^2 and the area has historically been subjected to significant flood events.

Major flood events occurred on the Eden catchment in 1822, 1856, 1925, 1968, 1972, 1995 and 2005. Properties in Warwick Bridge suffered flooding on three of those occasions; in 1968, 1995 and 2005.

Very heavy rainfall on the 7th and 8th January 2005 caused widespread flooding in the Eden valley and resulted in 30 properties flooding in the village including properties in and around Holme Eden Abbey, Bridge End cottages and nearby properties on the B6263 road to Wetheral. There are also known flooding problems on Trout Beck in the village where it flows in culvert underneath the A69.

The 2015 event caused by Storm Desmond was of greater magnitude than past events and the gauged flows in the River Eden were the highest on record. Table 1 shows the recorded maximum flows in the River Eden during these past flooding events and the numbers of properties affected at Warwick Bridge (where available).

Flooding Event	Number of Properties Flooded	Peak Flow in River Eden @ Warwick Bridge	Peak Flow in River Eden @ Great Corby
March 1968	-	1104	-
February 1995	-	812	-
January 2005	30	-	1373.0
November 2009	-	-	817.3
December 2015	42	-	1490.0

Table 1: Recent flood events affecting Warwick Bridge

The AEP describes the likelihood of a specified flow rate (or volume of water with specified duration) being exceeded in a given year. There are several ways to express AEP as shown in Table 1. Throughout this report AEP is expressed as a percentage. As such an event having a 1 in 100 chance of occurring in any single year (0.01 probability) will be described as a 1% AEP event.

AEP (as percent)	AEP (as probability)
50%	0.5
20%	0.2
10%	0.1
4%	0.04
2%	0.02
1%	0.01
0.1%	0.001

Table 2-Probabilities of Exceedance

Event Background

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

Flooding Incident

The village of Warwick Bridge is located in north-east Cumbria and is partly situated in the floodplain of the River Eden, which flows past the village to the west and north. Upstream of the former Warwick Bridge gauging station, the River Eden drains a mostly rural 2,200km^2 catchment that includes part of the north-east Lake District National Park. The Cairn Beck and Trout Beck system flows into the River Eden at Warwick Bridge and drains a 40km^2 catchment due south of the village. The location of Warwick Bridge and its major rivers are shown in Figure 1.

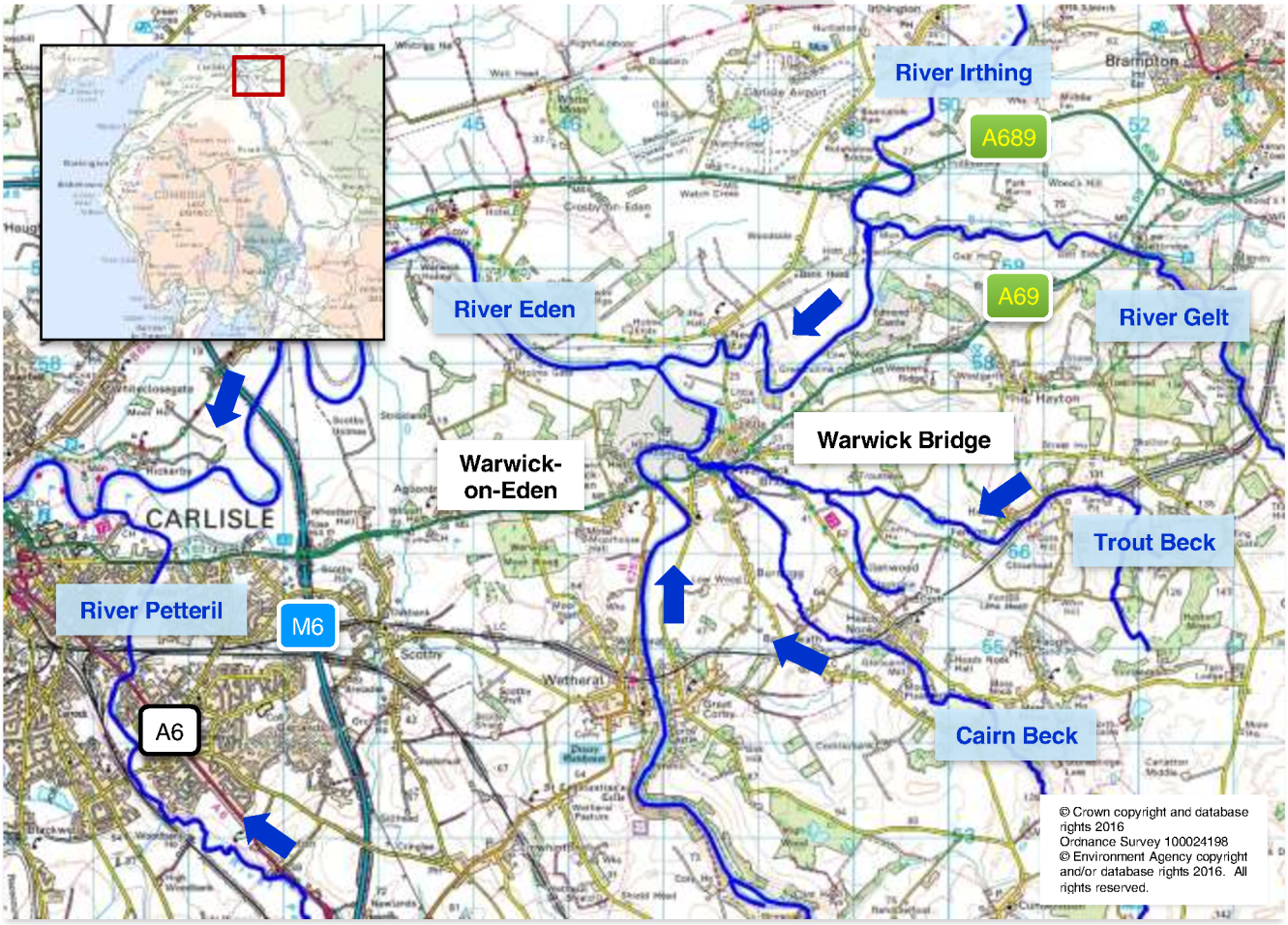


Figure 1: Location of Warwick Bridge and its major rivers

Warwick Bridge is located approximately 8km east of Carlisle on the A69 and has a population of approximately 1300. It is adjoined by the villages of Little Corby and Corby Hill to the east.

Due to its position within the floodplain of the River Eden, parts of Warwick Bridge lie within Flood Zone 3 and are therefore at a high risk of fluvial flooding from this source. Parts of the village are also at risk of fluvial flooding from Cairn Beck, Trout Beck, and surface water flooding.

On the 5th and 6th December 2015, 42 properties in Warwick Bridge and Warwick-on-Eden suffered significant flooding as a result of Storm Desmond, which caused record breaking rainfall over Cumbria

and other parts of north-west England. The storm led to widespread river and surface water flooding across Cumbria, with significant flood events occurring on the Eden, Derwent and Kent catchments.

Parts of Warwick Bridge village are located within the natural flood plain of the River Eden as are properties along the B6263 road to Wetheral, all of which are more susceptible to flooding

Flows overtopped the right hand bank of the river upstream of the Warwick Bridge road bridge and spilled onto the A69, with flood water flowing along the road and into the centre of the village. Properties to the north of the A69, including Holme Eden Hall, were severely affected, while properties in and around the junction between Little Corby Road and the A69 in the centre of the village were also flooded.

The high water levels in the River Eden also caused the smaller Cairn Beck tributary to back up and contributed to the flooding in the centre of the village at the A69 Little Corby road junction. This area was also initially affected by flooding from surface water and the highway drainage systems.

Figure 2 indicates the extent of the flooding that occurred in Warwick Bridge from all sources following Storm Desmond. A more detailed map showing the flooded extents, principle overland flow paths, and flood event reports is contained in Appendix 5.

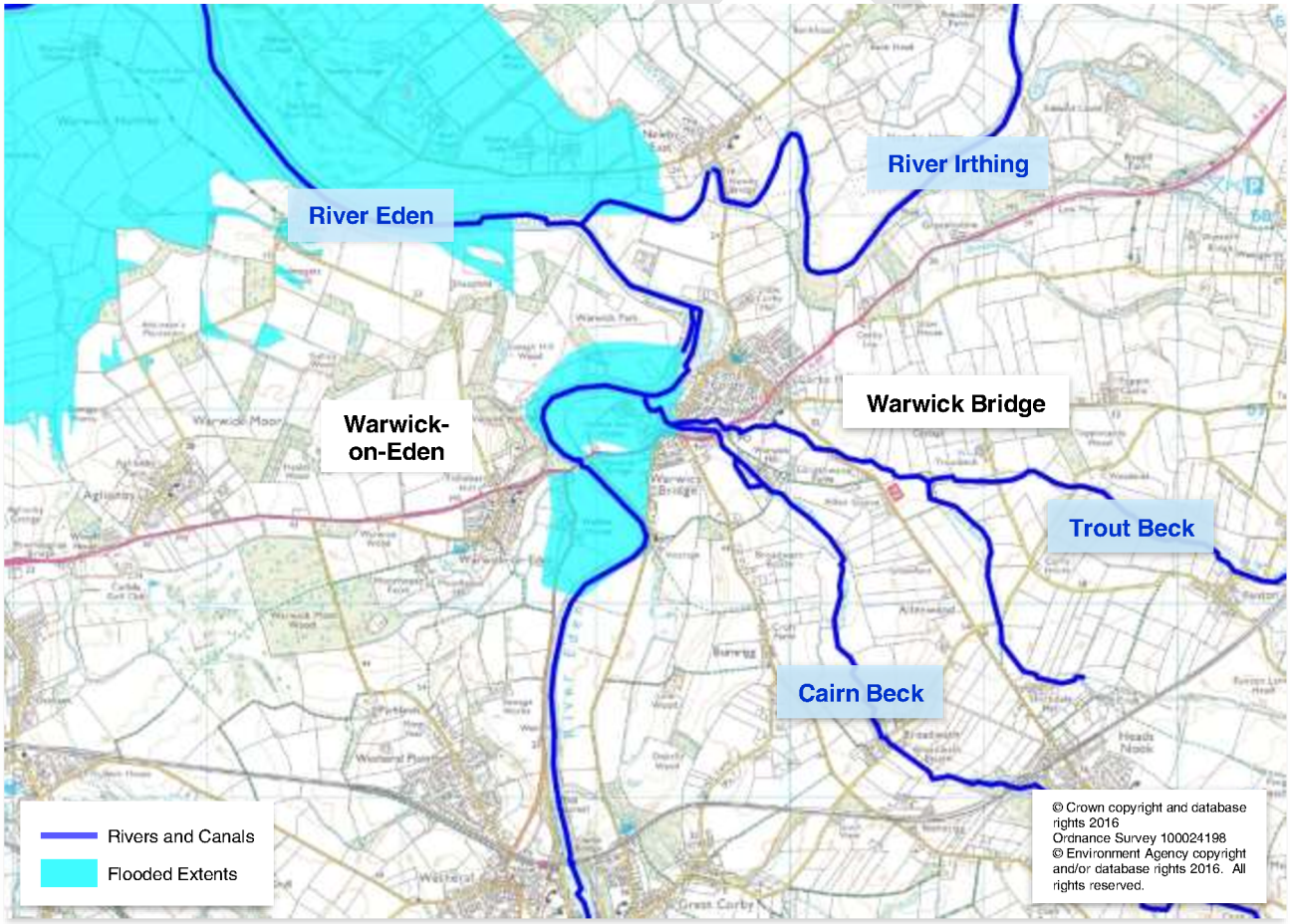


Figure 2: Extent of flooding in Warwick Bridge on 5-6th December 2015

Existing Flood Defences

There is a small flood defence embankment on the right bank of the River Eden downstream of the A69 road bridge. This embankment runs round the inside of the river bend before finishing on the north side of Holme Eden Hall.

Other flood risk management assets are located within the village on Cairn Beck and Trout Beck. These assets include a debris screen and culvert system at the confluence between these two smaller watercourses which flows underneath the A69. Whilst there were no reported issues with the operation of these assets during the Storm Desmond event, there have been problems in the past which have caused localised flooding.

A map of existing flood defence embankments and other flood risk management assets serving the village is shown in Figure 3.

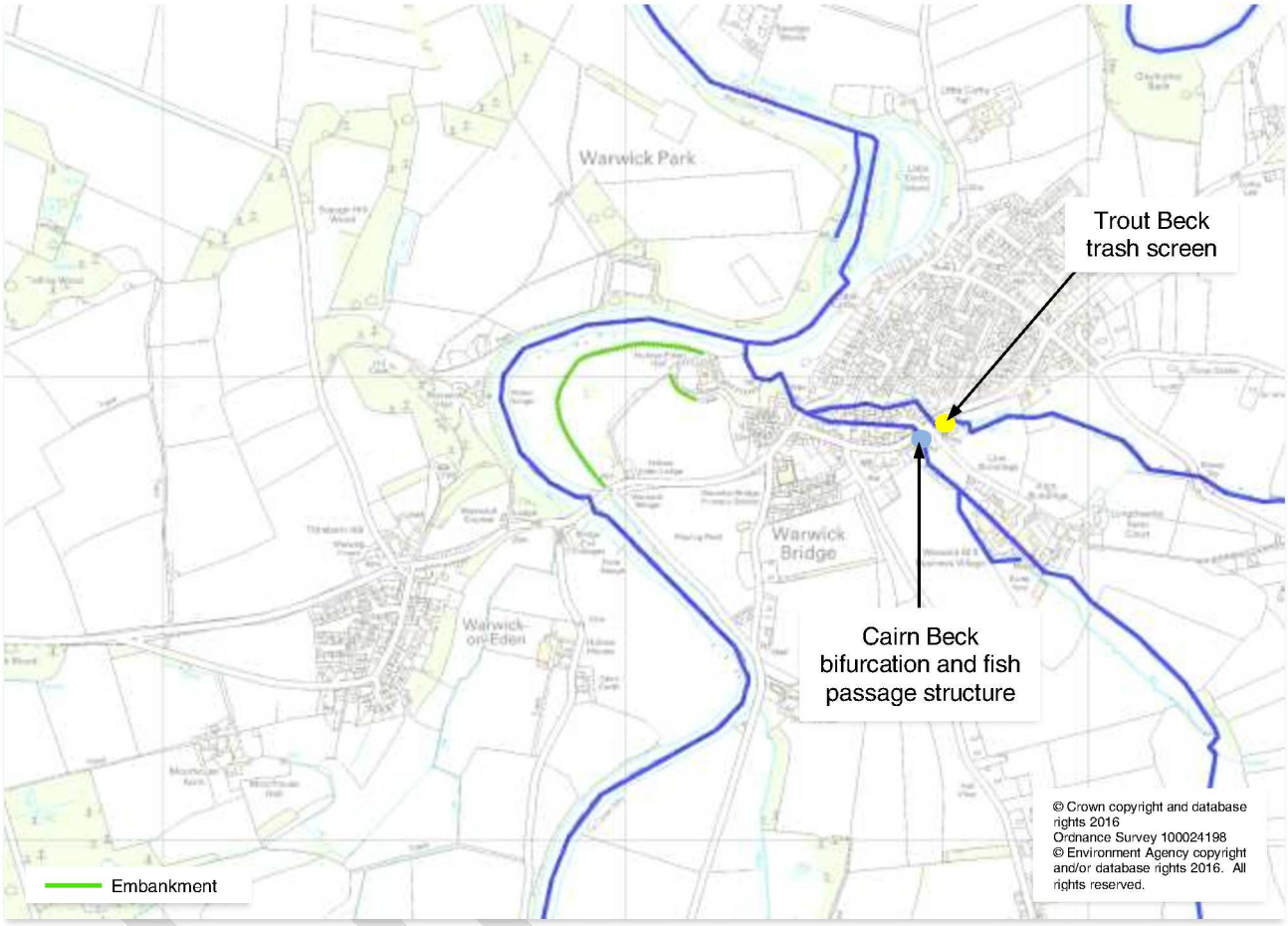


Figure 3: Existing flood defences in Warwick Bridge

Investigation

This section describes the rainfall and fluvial events that occurred on the River Eden catchment, the likely causes of flooding and the Environment Agency response in Warwick Bridge. It also provides a timeline of the events that occurred over 5th-6th December 2015.

This investigation was carried out by the Environment Agency using data collected from surveys of the area and from the communities affected with help from Cumbria County Council. This report combines this data to provide a detailed record of the flooding in Warwick Bridge.

Rainfall and Fluvial Events

December 2015 was the wettest calendar month on record, with much of northern England receiving double the average rainfall for that time of year. This also followed a particularly wet November during which catchments became saturated prior to the rainfall event associated with Storm Desmond.

From the 4th to the 7th of December 2015, Storm Desmond resulted in a period of prolonged rainfall across Cumbria, which was particularly intense over 5th-6th December and caused widespread flooding across the county. Over this period, new 24 and 48 hour rainfall records were set for the UK. Both of these were within Cumbria and broke the previous records, also within Cumbria, set in the November 2009 flood event which saw widespread devastation in the towns of Cockermouth, Keswick, and Workington. The record-breaking total rainfall values are presented in Table .

Rainfall Period	Storm Desmond			Previous Record		
	Date	Location	Total rainfall (mm)	Date	Location	Total rainfall (mm)
24 hour rainfall	December 2015	Honister Pass	341.4	November 2009	Seathwaite	316.4
48 hour rainfall	December 2015	Thirlmere	405.0	November 2009	Seathwaite	395.6

Table 3: UK Rainfall Records

Location	24 hour Rainfall during November 2009 Event	24 hour Rainfall during December 2015 Event	
	mm	mm	Estimated AEP
Scalebeck	60.8	147.6	0.2% to 0.1%
Skelton	42.2	137.8	<0.1%
Brotherswater	200.8	293.4	<0.1%
Aisgil	61.2	105.7	20% to 5%

Table 4 - Rainfall over 24 hours in the Eden catchment prior to the December 2015 event

Within the Eden catchment, Cumwhinton rain gauge recorded a total of 47.8mm of rain between 20:15 on 04/12/2015 and 05:00 on 06/12/2015. This rain gauge is located in the lower part of the Eden catchment which was not as badly affected as the upper Eden catchment. The upper Eden saw rainfall

totals (Table 3) comparable to Honister Pass and Thirlmere in Table , and explains why the primary cause of the event at Warwick Bridge was the River Eden.

The recorded rainfall at Cumwhinton is that which was associated with Storm Desmond and it followed a series of smaller rainfall events in the preceding days, which contributed to the already saturated ground conditions in the catchment.

A number of flow gauging stations are located within the catchment of the River Eden[1] (see Figure 4). One of the stations is located upstream of Warwick Bridge on the River Eden at Great Corby, which replaced Warwick Bridge gauging station (now closed) in 1996. Greenholme gauging station gauges flow on the River Irthing, which joins the River Eden approximately 1km downstream of Warwick Bridge and is located approximately 1.7km north-east of the village. Further downstream on the River Eden, Sheepmount gauging station is located in the centre of Carlisle. Together, these stations recorded the fluvial event caused by Storm Desmond and the recorded data is presented in Table 5 and Figure 5.

At Great Corby gauging station, the level of the River Eden peaked at 25.6m AOD at 06:00 on Sunday 6th December. This was the highest river level ever recorded and exceeded the previous record level of 25.4m AOD (January 2005).

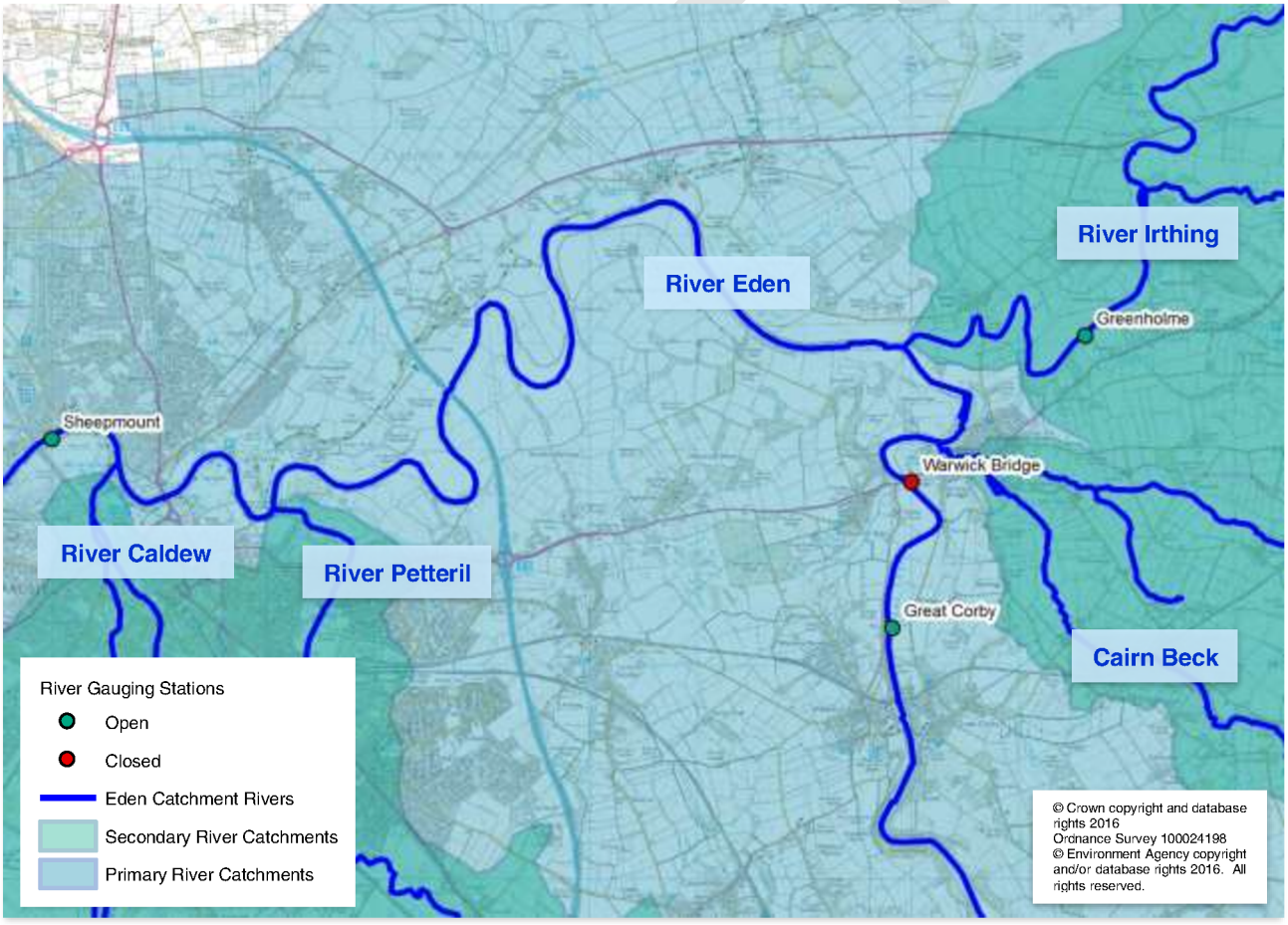


Figure 4: Location of river gauging stations in the River Eden catchment

[1] Flow gauging station data obtained from Environment Agency records and the National River Flow Archive (www.nrfa.ceh.ac.uk)

Gauging Station	River	Peak flow (m^3/s)	
		Dec 2015	Jan 2005
Great Corby	Eden	1490.0	1,373.0
Greenholme	Irthing	229.0	228.8
Sheepmount	Eden	1680.0	1516.4

Table 5: Recorded peak river flows in the River Eden Catchment

Source: Flow gauging station data obtained from Environment Agency records and the National River Flow Archive (www.nrfa.ceh.ac.uk)

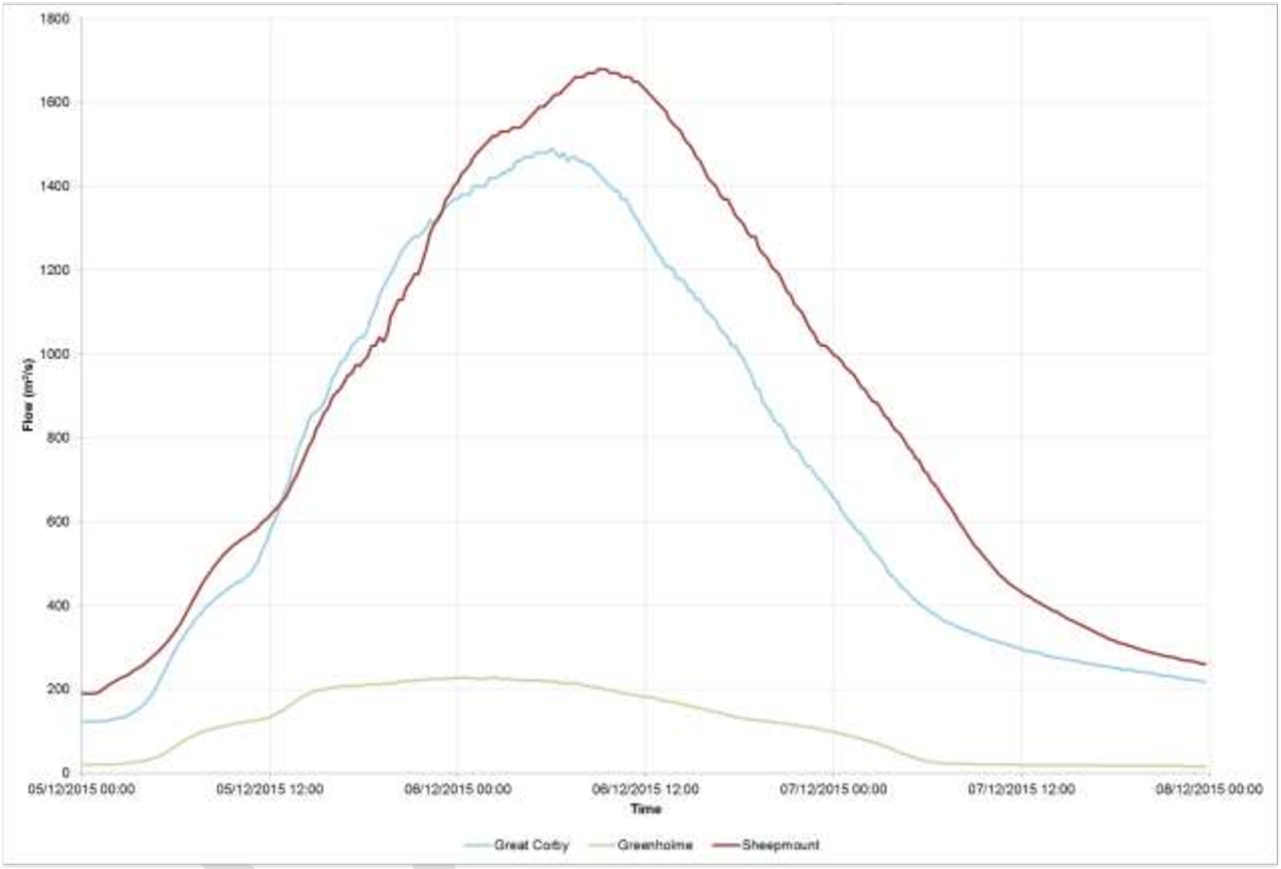


Figure 5: Gauged river flows at various locations in the Eden catchment on the 5th-6th December 2015

The recorded peak flow at Great Corby gauging station is greater than any flow previously recorded at this location on the River Eden and initial analysis of this data suggests that the December 5th event had a 0.25% probability of occurring in any given year (0.25% Annual Exceedance Probability or AEP).

Whilst there are no flow gauging stations on the Cairn Beck system, rainfall data for the wider Eden catchment indicates that the catchment of this tributary system did not receive as much rainfall as in other areas of the upper Eden (including the River Eamont, which drains part of the Lake District National Park including Helvellyn). This provides further evidence for the principle cause of the flooding in Warwick Bridge being the fluvial event on the River Eden, and that the flooding on Cairn Beck was mainly caused by flood water backing up the beck from the River Eden.

Sources of Flooding, Flood Flow Routes and Event Timeline

The flooding in Warwick Bridge on the 5th and 6th December 2005 was from several sources. More information is required on the timing of the early onset of flooding from surface water and road drainage in addition to flooding from the River Eden. The principle source of flooding was from the River Eden near the A69 road bridge with flooding occurring first to Bridge Cottages, Eden Garth, and Holme House located along the B6263 road to Wetheral. Flood waters then flowed over land and along the A69, across Downagate Community playing fields before joining flood flows from the River Eden and Cairn Beck on Little Corby Road. Holme Eden Hall and adjoining properties was also affected by the flooding

An overview of the principle flood flow routes in and around Warwick Bridge is presented in Figure 6, while Figure 7 is an aerial photograph taken on 6th December 2015 showing the flooded extents in and around Warwick Bridge.

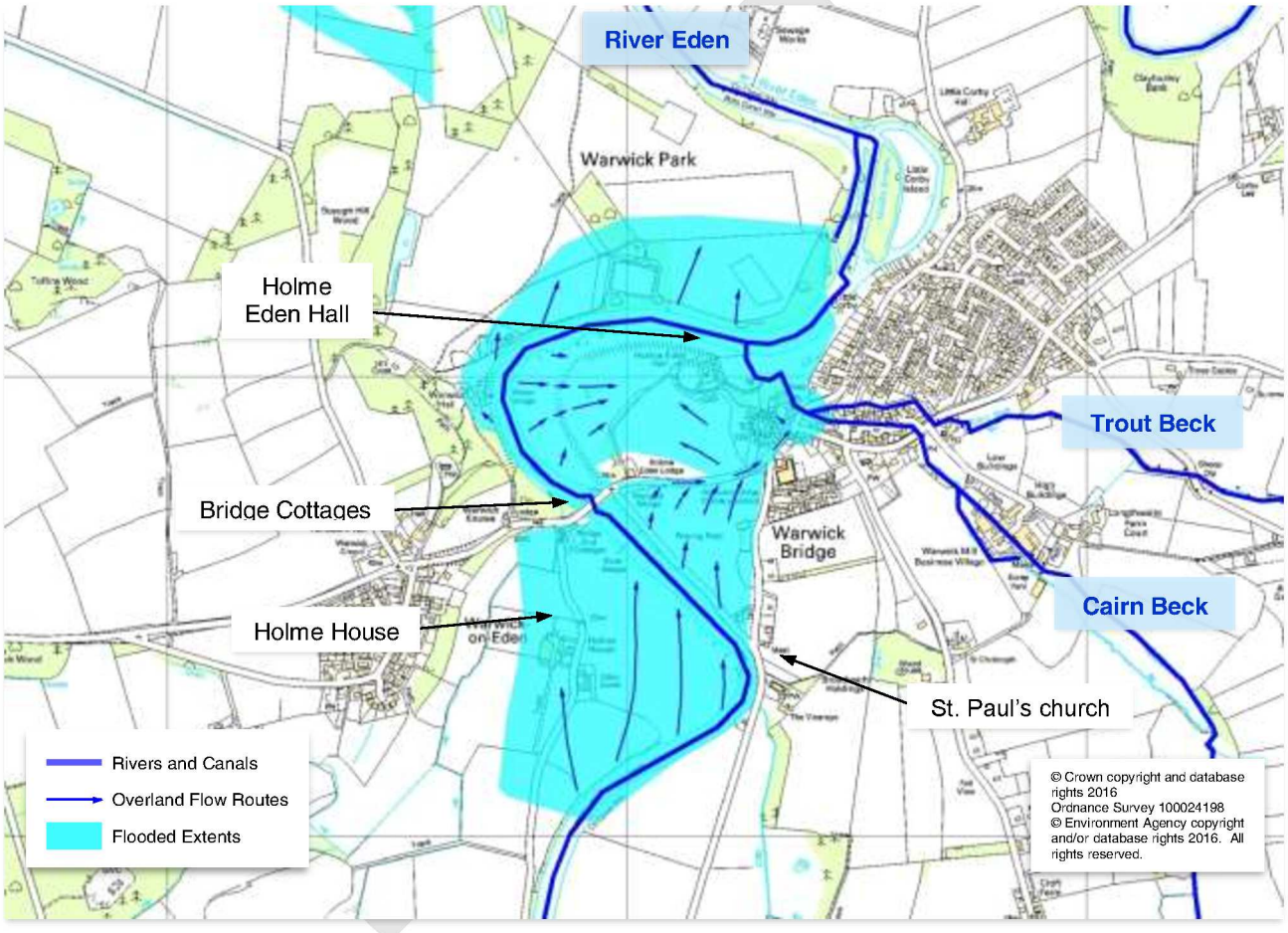


Figure 6: Principle overland flow routes in and around Warwick Bridge

Figure 7: Flooded extents at Warwick Bridge on the 6th December 2015, looking south

Table provides a summary timeline of the key events as the flooding affected Warwick Bridge.

4th December 2015	Event
15:10	Flood Alert issued (Middle River Eden)
20:15	First rainfall associated with Storm Desmond recorded at Cumwhinton rain gauge.
5th December 2015	**Event**
10:20	Flood Warning issued (011FWFNC10A: River Eden at Warwick Bridge, Holme House, Bridge End and Holme Eden Hall).
15:42	Flood Warning issued (011FWFNC10B: River Eden at Warwick Bridge, Warwick Park and Holme Eden Gardens Area).
6th December 2015	**Event**
00:12	Severe Flood Warnings for Warwick Bridge issued.
04:00	Severe backing-up on Cairn Beck/Trout Beck observed upstream of Little Corby Road.
06:00	River Eden peak at Great Corby gauging station: 25.6m AOD/1,490m^3/s.

Table 6: Summary timeline of key events during the Kendal flooding

Likely Causes of Flooding

Fluvial Flooding: River Eden

On 5th December 2015, the principle source of fluvial flooding in Warwick Bridge was the River Eden. As the maps in this report show, the river makes a series of broad meanders as it flows past the west side of the village and during the main flood event, the floodplain within these meanders became inundated. Whilst most of the properties in Warwick Bridge are not located within the flood plain, a number of individual properties outside of the village are located within the flood plain. These properties include Holme House and Eden Garth to the south, together with the Bridge Cottages terrace, situated immediately adjacent to the A69 bridge over the River Eden on its left bank. These properties suffered significant flooding as the river overtopped its banks and the depth of the flooding to Bridge Cottages is shown in Figure 8.

Figure 8: Flooding to Bridge Cottages off the A69

On the opposite side of the River Eden the basement of St. Paul's Church was also reported to have flooded. The church lies just outside of Flood Zone 2 and is situated on relatively high ground.

Upstream of the A69 road bridge, the Downagate Community Centre playing fields on the right hand bank of the river were inundated as flows surged towards the A69. The wrack line (Figure 9) along the wire fence that forms the boundary of the field with the A69 indicates that the floodwater was approximately 1.3m deep in places and as the depth increased, so more water was able to inundate the A69 and flow into the village.

Figure 9: Wrack line along northern boundary of the Downagate Community Centre playing fields

Land to the north of the A69 is separated from the road by a stone wall standing approximately 1.5m high. This wall had a significant impact on preventing excess flood water at the road bridge from crossing over the A69 and being able to flow back into the River Eden downstream of the bridge. Instead, flood water flowed along the A69 into the centre of Warwick Bridge (see Figure 6 and Figure 10). Properties on both sides of the A69 suffered flooding, while Warwick Bridge primary school only just avoided being affected.

Figure 10: Principle flow path along the A69 into the centre of Warwick Bridge

Once in the village, floodwater flowed down the access road to Holme Eden Hall off the junction of the A69 with Little Corby Road. This access road is narrow and flanked by stone walls, meaning that flow velocities were high. The floodwater affected numerous properties in this location, including homes built relatively recently within a former walled garden. Figure 11 is an aerial photograph taken on 6th December 2015 and shows the extent of flooding within the village, including the flooding to properties within the former walled garden.

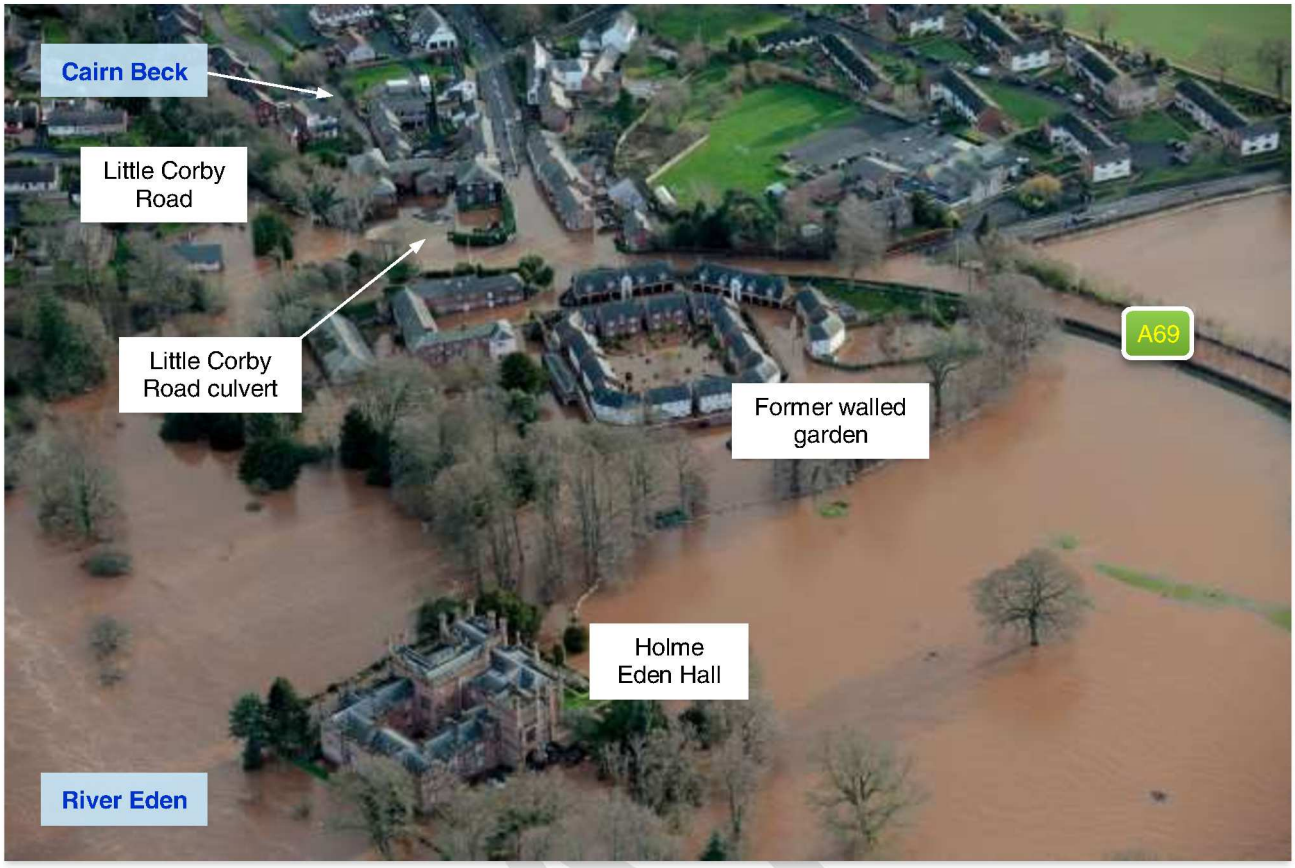


Figure 11: Flooded extents in the centre of Warwick Bridge

Downstream of the A69 road bridge, flood flows from the River Eden overtopped the flood embankment and merged with flood water that had entered the village from the Downagate Community Centre playing fields. The defence embankment is show in Figure 12.

Figure 12 also shows evidence of significant scouring of the right hand bank, which occurred immediately downstream of the bridge. The road bridge was temporarily closed following the flooding whilst inspections were carried out.

Figure 12: Scouring to right bank of the River Eden downstream of the A69

Fluvial Flooding: Cairn Beck

In the centre of Warwick Bridge flooding from the River Eden was exacerbated to a certain extent by flooding from Cairn Beck. Cairn Beck and Trout Beck meet immediately upstream of the A69 opposite Waters Meet and pass beneath the A69 via a system of culverts. This system also incorporates a bifurcation and fish pass structure which diverts flow from Trout Beck into a Mill Race, which runs parallel to Cairn Beck before returning to the main channel upstream of the Little Corby Road culvert.

During the Storm Desmond event, a combination of a high water level on the River Eden and capacity limitations at the Little Corby Road culvert caused flows in Cairn Beck to back-up and contributed to the flooding on Little Corby Road. Figure 13 shows the upstream face of the Low Corby Road culvert, which is significantly skewed (i.e. is not perpendicular) to the alignment of the Cairn Beck channel. This type of arrangement has the effect of reducing the overall capacity of the culvert due to the sharp change of direction that flows have to go through. This means less water can get through the culvert, and this creates higher water levels upstream of the structure.

Whilst the arrangement of the Little Corby Road culvert may have caused some initial backing-up of flows, the principle cause was the exceptional water level on the River Eden. Figure 11 shows how the flood from the River Eden extended into this location in the village causing flood flows in Cairn Beck to back-up.

Figure 13: Little Corby Road culvert (Cairn Beck)

Flooding from Artificial Drainage Systems

The area on the south side of the A69 at its junction with Little Corby Road has a history of problems with the highway drainage system. The existing infrastructure for receiving surface water run-off in this area includes two kerb drains, a wide inline drainage channel and a large road gully.

Reports suggest that the initial source of flooding in this area was from this surface water drainage infrastructure. Whilst no detailed plans or survey information has been made available, it is likely that this drainage discharges directly to Cairn Beck. Backing-up in the system may have been due to a blockage, the high water levels in Cairn Beck itself, or a combination of the two.

It should, however, be noted that further investigations are required to confirm the connectivity and condition of the existing drainage in this area. See the Recommended Actions section of this report for further details.

Environment Agency Flood Incident Response

Pre-event Warning and Preparation

A Flood Alert for the River Eden catchment was issued on the 4th of December at 15:10. Following this, Flood Warnings were issued to the flood warning areas for Warwick Bridge between 10:20 and 15:42 on the 5th December. Severe Flood Warnings were issued at 00:12 the following day. The details of the flood warning areas and the timings of these warnings are shown in Appendix 4.

Immediately prior to the flood event the Environment Agency inspected watercourses and operational structures such as debris screens to ensure that there were no blockages which may have caused an increase in flood risk.

Post-event Repairs and Maintenance

Following the flood event, the Environment Agency has removed blockages and obstructions from key structures on the River Eden and Cairn Beck. There are relatively few Environment Agency maintained flood defence assets in this area.

On-going Maintenance Activities

The Environment Agency maintains flood risk management structures and sections of river channel where this actively reduces the risk of flooding to people and property. Activities we undertake are summarised below:

- We conduct yearly visual inspections of flood defence embankments and walls, and deliver a variety of maintenance tasks which include, as necessary:
  - Grass cutting,
  - Tree and bush management,
  - Invasive species control,
  - Vermin control and
  - Expansion joint repairs.

- We deliver targeted maintenance on River Channels where the activity is beneficial to the reduction in flood risk. This could include:
  - Weed Control,
  - Grass Control,
  - Tree and Bush Management,
  - Invasive Non Native Species Control,
  - Gravel Removal, when justified through investigation and survey.

- On operational structures, we undertake:
  - Quarterly operational inspections and
  - Yearly mechanical maintenance

- On culverts, which could pose a risk of flooding to properties, we monitor the risk of flooding through 6 yearly inspections, and deliver the following on a risk based approach:
  - Cleansing works
  - Repairs and reconditioning works

Recommended Actions

The following table details recommended actions for various organisations and members of the public to consider, using the Cumbria Floods Partnership's 5 Themes: Community Resilience, Upstream Management, Strengthening Defences, Maintenance, and Internal Drainage Boards (IDBs). Some of these recommendations may have already been carried out or are ongoing.

Some of the actions referred to in Table 7 are identified on Figure 14 following this table.

Cumbria Flood Partnership Theme	Action by	Recommended Action	Timescale
Community Resilience	Cumbria Local Resilience Forum*	Review and update plans to enable homes and business to be better prepared for, and to reduce the impacts of, flooding. For example, review evacuation procedures/emergency response.	2016
Community Resilience	Environment Agency	Review modelling data to ensure that hydraulic models for the River Eden catchment reflect real conditions as accurately as possible and replicate the 5th-6th December 2015 flood event to ensure the flooding mechanisms identified are fully understood. Update the models where required and use this information to make any improvements to the flood forecasting and warning service. Assess the interaction between the River Eden and the Cairn Beck system.	2016
Community Resilience	Environment Agency	Review and update the Flood Warning Areas for Warwick Bridge as required, ensuring they reflect all known fluvial flooding mechanisms in the Warwick Bridge river system as far as possible.	2016
Community Resilience	Environment Agency and Residents	Ensure all properties at risk are registered to receive flood warnings and that all details are up-to-date.	2016
Community Resilience	Residents	Implement flood resilience measures within flooded properties to reduce the impacts of future flooding.	2016
Maintenance	Cumbria County Council	Cumbria County Council (minor roads in village including Little Corby Rd junction) and Roadlink (A69) are undertaking; ○ Gulley emptying ○ De-silting and jetting connecting pipework to outfalls to watercourses ○ Survey and mapping highways drainage system. This includes identification of any defects which will be inform programme of additional works	June/July2016
Strengthening Defences	Environment Agency	Review the need for investment in flood defences for Warwick Bridge on the River Eden and Cairn Beck. Including the existing flood embankment between A69 and Holme Eden Hall.	2016

Cumbria Flood Partnership Theme	Action by	Recommended Action	Timescale
Strengthening Defences	Cumbria County Council, South Lakeland District Council, and United Utilities	Review the performance of the existing drainage and sewerage systems, particularly those on the A69/Little Corby Road junction during the event to better understand where improvements are required.	2016
Strengthening Defences	Environment Agency, Cumbria County Council, and Carlisle City Council	Review case for improving the existing Standard of Protection in Warwick Bridge as part of a wider appraisal of flood risk management improvements in the Eden catchment (including Carlisle and Low Crosby). Consider possible 'quick wins' within appraisal process to give a 'joined-up' approach. Investigate solutions to prevent overland flows from the River Eden being channelled along the A69 and into Warwick Bridge. These solutions are likely to include opening up the existing wall on the north side of the A69 to direct floodwater into the greenfield land adjacent to Holme Eden Hall. Other solutions should consider providing raised defences around Holme Eden Hall and properties in and around the former walled garden. The walls of the walled garden themselves could be used, but these would have to be strengthened and consideration given to potential 'weak links' (e.g. drainage systems).	2016-2017

Table 7: Recommended actions for consideration

*The Cumbria Local Resilience Forum includes emergency services, local authorities, Cumbria County Council, Environment Agency, Maritime Coastguard Agency and health agencies along with voluntary and private agencies. Under the Civil Contingencies Act (2004) every part of the United Kingdom is required to establish a resilience forum.

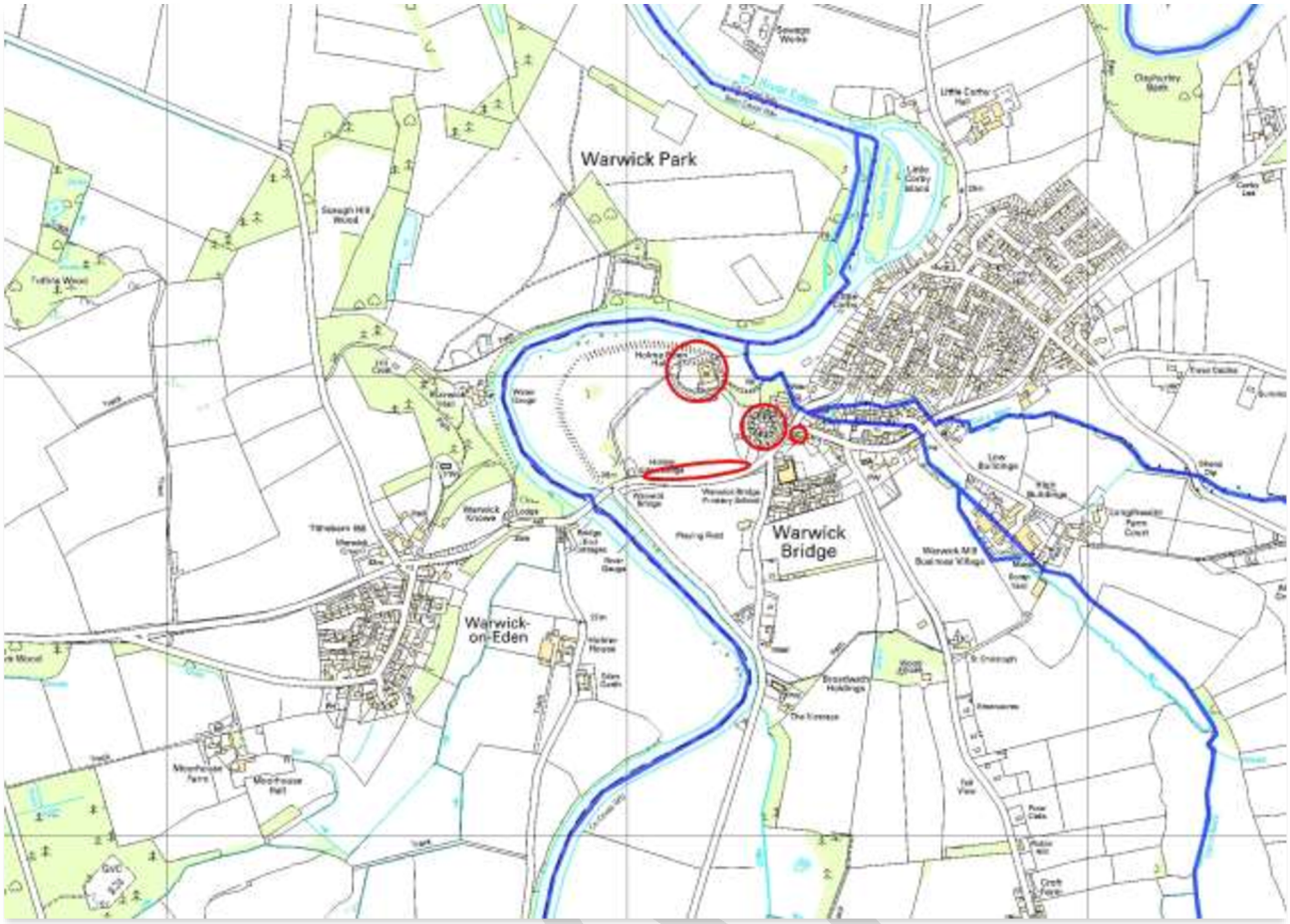


Figure 14: Recommended actions for Warwick Bridge

Next Steps

The Cumbria Floods Partnership has brought together a wide range of community representatives and stakeholders from a variety of sectors to plan and take action to reduce flood risk. The Cumbria Floods Partnership, led by the Environment Agency, is producing a 25 year flood action plan for the Cumbrian catchments worst affected by the December 2015 flooding.

The plan will consider options to reduce flood risk across the whole length of a river catchment including upstream land management, strengthening flood defences, reviewing maintenance of banks and channels, considering water level management boards and increasing property resilience. The Cumbria Floods Partnership structure below details how these 5 themes are being delivered in the Flood Action Plans which will be completed in July 2016.

The Cumbria Floods Partnership was set up by Flood Minister Rory Stewart MP following December's floods, and includes all of Cumbria's RMAs. They are working alongside the existing 'Cumbria Strategic Partnership', which was formed as part of the Flood and Water Management Act 2010 and comprises of the County's RMAs, including the Environment Agency, Cumbria County Council, Local Authorities and United Utilities. Both partnerships are working with communities, businesses, and relevant stakeholders to understand and reduce flood risk across Cumbria.

Figure 15 helps to demonstrate how the two partnerships are working together.

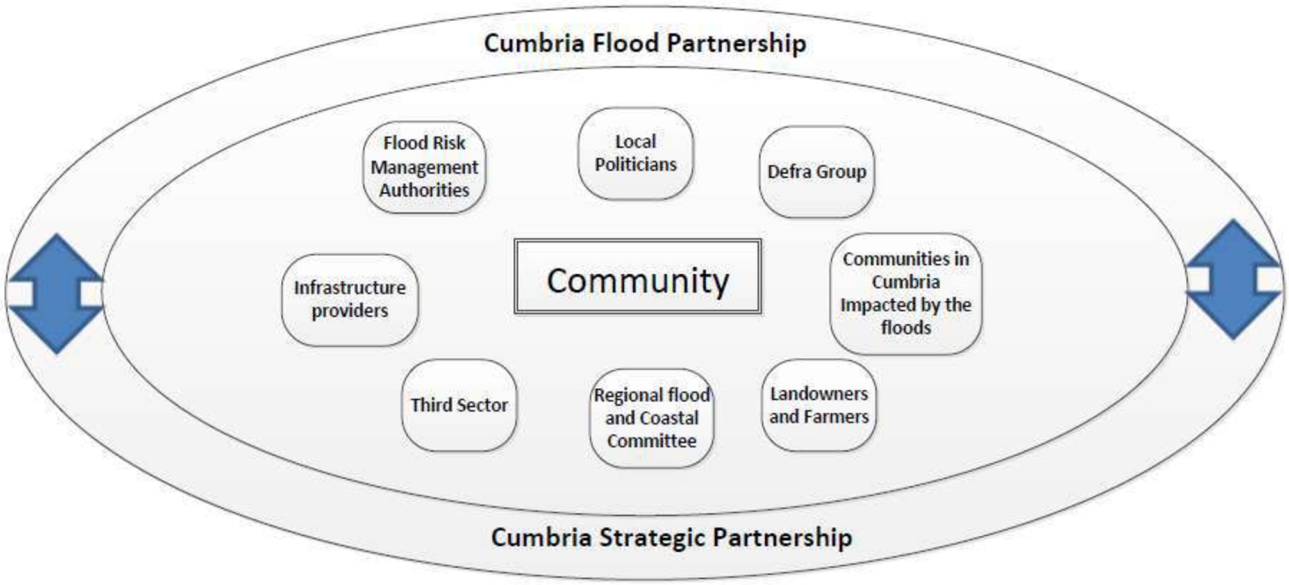


Figure 15: Cumbria Flood Partnership and Cumbria Strategic Partnership

The Environment Agency is currently updating the hydraulic model for the Eden Catchment, which is used to assist with flood forecasting and will help to assess future flood risk management options for the catchment as a whole. This study is due to be completed in September and will be used as part of the review of the current Flood Warning Areas for Warwick Bridge.

The data from this event is also being used to carry out a review of the existing flood defence assets in Warwick Bridge. Following this, the Environment Agency will work with the relevant parties to carry out the recommended actions and to manage the risk of future flooding. Part of this will include an assessment of options to improve the existing standard of protection from flooding in Warwick Bridge.

Appendices

Appendix 1: Glossary

AEP	Annual Exceedance Probability
CCC	Cumbria County Council
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
FAG	Flood Action Group
FSR	Flood Storage Reservoir
FWD	Flood Warnings Direct
LLFA	Local Lead Flood Authority
MSfW	Making Space for Water
RMA	Risk Management Authority
SOP	Standard of Protection

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

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					
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 the LLFA's work relating to flood risk.

Environment Agency: Strategic overview of all sources of flooding and coastal erosion as defined in the Flood and Water Management Act (2010). As part of its role concerning flood investigations, this requires providing evidence and advice to support other RMAs. The Environment Agency also collates and reviews assessments, maps and plans for local flood risk management (normally undertaken by LLFA).

Lead Local Flood Authorities: 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 RMA 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 RMAs 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. These organisations are classed as RMA's.

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 now responsible for a larger number of sewerage than prior to the regulation. These organisations are classed as RMAs.

Highway Authorities: 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. These organisations are classed as RMAs.

Flood risk in Cumbria is managed through the Making Space for Water (MSfW) process, which involves the co-operation 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 MSfW Groups will meet approximately 4 times per year to co-ordinate operations and work together to mitigate flood risk in the vulnerable areas identified in this report by completing the recommended actions. As LLFA, CCC 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 process or a partner's own capital investment process.

Flood Action Groups are usually formed by local residents who wish to work together to help reduce flood risk in their area. The FAGs are often supported by either CCC or the Environment Agency and provide a useful mechanism for residents to forward information to the MSfW Group.

Appendix 3: Links to Other Information on Flooding

Sign up for Flood Warnings
https://www.gov.uk/sign-up-for-flood-warnings

Environment Agency – Prepare your property for flooding; a guide for householders and small businesses to prepare for floods
https://www.gov.uk/government/publications/prepare-your-property-for-flooding

Environment Agency – What to do before, during and after a flood: Practical advice on what to do to protect you and your property
https://www.gov.uk/government/publications/flooding-what-to-do-before-during-and-after-a-flood

Environment Agency – Living on the Edge: A guide to the rights and responsibilities of riverside occupiers
https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

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

Appendix 4: Flood Warnings and Alerts

Kendal is covered by a Flood Alert, and certain areas are served by four Flood Warnings as shown in the table below, which summarises the times of the flood warnings issued during this flood event:

Flood Warning	Flood Warning Issued	Severe Flood Warning Issued	Properties	Contacts	% Success*
011FWFNC10A	05/12/15 10:20	06/12/15 00:12	48	156	74
011FWFNC10B	05/12/15 09:53	05/12/15 16:55	58	169	78

The following pages show additional details on the flood alerts and warnings issued during this event.

Flood Alerts

011WAFME: Middle River Eden

Alert issued on Thursday 03/12/2015 at 14:46
Alert removed on Friday 04/12/2015 at 06:49
Alert issued on Friday 04/12/2015 at 15:10
Alert removed on Thursday 10/12/2015 at 22:41

Customers in Flood Alert area registered on FWD: 111
Contacts (landline, mobile, email etc.) in Flood Alert area registered on FWD: 268
Successful contacts: 213
Unsuccessful contacts: 55

Alert Message:

A Flood Alert has been issued by the Environment Agency for the Middle River Eden. Flooding is possible for River Eden and tributaries from Temple Sowerby to the confluence with the River Irthing at Warwick Bridge including Langwathby, Lazonby, Kirkoswald, Armathwaite, Wetheral and Warwick on Eden. Low lying land and roads will be affected first.

Be prepared to protect yourself, family, pets and property.

Heavy and persistent rainfall is forecast to continue throughout today until this evening. With the ground already saturated the river levels are expected to rise and we may see some localised flooding to low lying land and roads. An outlook for the weekend shows although Friday is looking a relatively dry day, the rain will again become heavy and persistent in the early hours of Saturday continuing right through until Sunday. As River levels are already high, we may see some localised flooding throughout Cumbria.

*Contact Successful if at least one attempt to contact a fully-registered recipient registered to the property returned a status of "Acknowledged", "Successfully Received", "Successfully Sent" or "Unacknowledged"

Flood Warning Target Areas

011FWFNC10A: River Eden at Warwick Bridge, Holme House, Bridge End and Holme Eden Hall

Flood Warning issued on Saturday 05/12/2015 at 10:20
Severe Flood Warning issued on Sunday 06/12/2015 at 00:12
Severe Flood Warning removed on Monday 07/12/2015 at 17:29

Date/Time Warning Level Reached: 05/12/2015 13:00
Time customers had to take action: 02:39:20
Customers in Flood Alert area registered on FWD: 48
Contacts (landline, mobile, email etc.) in Flood Alert area registered on FWD: 156
Successful contacts: 115
Unsuccessful contacts: 41

Warning Message:

A Flood Warning has been issued by the Environment Agency for the River Eden at Warwick Bridge, Holme House, Bridge End and Holme Eden Hall.

Flooding is expected for low lying roads, agricultural land and isolated properties adjacent to the River Eden at Warwick Bridge, Holme House, Bridge End and Holme Eden Hall. Immediate action required.

Heavy and persistent rainfall is expected throughout Saturday and in to Sunday. River and lake levels will continue to rise. Please check for updates throughout the weekend.

The river level recording station used for this flood warning is Great Corby.

011FWFNC10B: River Eden at Warwick Bridge, Warwick Park and Holme Eden Gardens Area

Flood Warning issued on Saturday 05/12/2015 at 15:42
Severe Flood Warning issued on Sunday 06/12/2015 at 00:12
Severe Flood Warning removed on Monday 07/12/2015 at 18:16

Date/Time Warning Level Reached: 05/12/2015 15:30
Time customers had to take action: -00:15:00
Customers in Flood Alert area registered on FWD: 58
Contacts (landline, mobile, email etc.) in Flood Alert area registered on FWD: 169
Successful contacts: 131
Unsuccessful contacts: 38

Warning Message:

A Flood Warning has been issued by the Environment Agency for the River Eden at Warwick Bridge, Warwick Park and Holme Eden Gardens Area.

Flooding is expected for Low lying roads, agricultural land and residential properties adjacent to the River Eden at Warwick Bridge, Warwick Park and Holme Eden Gardens Area. Immediate action required.

Heavy and persistent rainfall is expected throughout Saturday. River levels will continue to rise and further Flood Warnings are likely. Please check for updates throughout the weekend. Operational Teams have closed flood defences and are checking watercourses for blockages.

The river level recording station used for this flood warning is Great Corby.

Appendix 5: Data Capture Map for Warwick Bridge

Report to Environment & Economy Overview and Scrutiny Panel

Agenda Item: **A.4**

Meeting Date:	28 July 2016
Portfolio:	Environment and Transport
Key Decision:	Not Applicable:
Within Policy and Budget Framework	YES
Public / Private	Public
Title:	RETHINKING WASTE PROJECT UPDATE
Report of:	Neighbourhood Services and Enforcement Manager
Report Number:	LE 14/16

Purpose / Summary:

This report provides an update on the progress of the Rethinking Waste Project and highlights key issues going forward. A separate presentation at the meeting will provide more detail.

Recommendations:

Scrutiny Panel is recommended to receive the report, note the progress made and to agree future dates to review progress as the project approaches implementation and post implementation.

Tracking

Executive:	
Overview and Scrutiny:	
Council:	

1. INTRODUCTION AND BACKGROUND

On 29 June 2015, the Executive considered a range of options for the future shape of the Council's refuse and recycling collection service. At this time the Executive agreed to support the recommendation (option one) subject to the development of a full business case. This would see the fortnightly collection of:

- refuse in a 240 litre wheeled bin for the majority of households
- garden waste in a 240 litre wheeled bin for the majority of households (where appropriate)
- recycling (card, paper, glass, plastic and cans) using a 'modern Resource Recovery Vehicle'.

This report now provides an update for Scrutiny on the progress of the Rethinking Waste Project and highlights the key developments as we work to improve our refuse and recycling service for the benefit of residents. The report and supporting presentation will:

- provide an update of progress against the original aims of the project
- confirm the key dates (project plan)
- outline our commitment to communication and what the project will mean for residents
- identify the developments and preferred vehicle options
- provide information on the likely financial impact of the changes

2. AIMS

The original aims of the project are outlined below:

- Acquire new refuse collection vehicles to replace and modernise our fleet
- Acquire new vehicles to collect all dry recycling materials in one go
- Retain the current collection containers and bins
- Introduce appropriate changes in the collection rounds to maximise efficiency
- Bring in-house all the recycling collections
- Develop a transfer station to manage the materials
- Develop a new team to manage and deliver the service and transfer station and potentially introduce changes to working patterns of operational staff to maximise productivity and reduce costs
- Meet TEEP (Technically, Environmentally and Economically Practicable) requirements and seek to increase recycling rates across the borough.

2.1 Update on the original project aims

2.1.1 Acquire new refuse collection vehicles to replace and modernise our fleet

Two new refuse collection vehicles (RCVs) were delivered in October 2015 to replace older vehicles. A further RCV (smaller 16ton vehicle) has been ordered and will be delivered in August 2016.

In addition, a procurement process is currently underway to confirm prices and the availability of a range of different vehicle options to support the Rethinking Waste Project. To support this, a fleet replacement programme is being developed to identify the dates when Council vehicles and plant will need replacing on a rolling 5 – 7 year programme and to ensure that capital resources are appropriately identified and planned for.

The specification of the new vehicles is also being refined in discussion with staff to ensure that our fleet is flexible and fit for purpose. Typical examples would include:

- improving safe access - rear steer, improved turning circles, narrower vehicles, shorter wheelbase, routes individually risk-assessed
- improved efficiency – larger (32 tonne) collection vehicles have been viewed and are being modelled to see if this can introduce further efficiencies by reducing the frequency of trips to the tip (down time)
- improved monitoring – improved vehicle trackers and on-board CCTV
- improved communication / response – in-cab technology, route guidance, back office links etc.
- increased safety – emergency stop buttons, 'drive-lock' technology, driver training

2.1.2 Acquire new vehicles to collect all dry recycling materials in one go

This remains the key part of the review. Following extensive trials, a different vehicle solution is now favoured for both operational and financial reasons.

2.1.3 Retain the current collection containers and bins

This remains a key objective to minimise disruption for residents and to support the financial case.

2.1.4 Introduce significant changes in the collection rounds to maximise efficiency

We are using specialist software to support the re-design of refuse and recycling collection rounds and to support the assumptions being made on the number of vehicles and staff needed to deliver an efficient, effective and safe service for residents within the available budget but at the same time addressing the growth needed to accommodate new housing.

2.1.5 Bring in-house all the recycling collections

The Council's green box collections contract (currently with FCC) has been extended to end of February 2017 at existing contract rates. This service will then transfer back to the Council from the 01 March 2017 with the staff transferring under TUPE.

2.1.6 Develop a transfer station to manage the materials

As previously reported to Scrutiny, this is no longer an aim of the project. An outline business case was prepared by our appointed consultants 'Eunomia' that confirmed that the rewards (increased income from sale of recycling) nowhere near justified the

significant financial investment (capital and revenue), the likely development control mitigation measures, and other associated operating risks (health and safety).

2.1.7 Develop a new team to manage and deliver the service and transfer station and potentially introduce changes to working patterns of operational staff to maximise productivity and reduce costs

A restructure of Neighbourhood Services has been carried out following consultation and at the time of writing we are in the process of appointing to the new structure. This will ensure that our structure is fit for purpose going forward. The requirement to manage a waste transfer station is no longer required.

As part of this restructure, an officer has been seconded to the role of Programme Lead Re-thinking Waste to provide an experienced and dedicated resource to take the project forward to full implementation.

2.1.8 Meet TEEP (Technically, Environmentally and Economically Practicable) requirements and seek to increase recycling rates across the borough.

The information outlined in appendix two will help to illustrate how the proposed changes address the TEEP considerations.

3. OTHER DEVELOPMENTS

Scrutiny is reminded of the work already carried out as part of the wider service improvements:

- **Drivers –** drivers have been assimilated to the new improved pay grade that better reflects their supervisory responsibilities (service quality / health and safety etc) and which has also supported recruitment.
- **Driver training –** a number of staff have also been trained as HGV drivers to increase service resilience and reduce reliance on external agency support.
- **Soft market testing day –** a soft market testing day was held to hear direct from the recycling and waste sector in terms of the options going forward to help guide service re-design and the development of the business case. In particular, the day was designed to gather information on the likely value of recycling based on the method of collection and degree of source separation.
- **Review of technology –** potential suppliers have also been invited to show-case their products and systems for vehicle trackers, on board cameras and in-cab communication / guidance. Integration of these systems into the Council's customer relationship management and other back office systems is a key part of this development.
- **Service Improvement Group –** a service improvement group has been established to hear regularly from staff directly about their ideas and suggestions for service improvement.

- **Health and Safety Inspection Visit –** the refuse and recycling collection service was subject to a formal visit from the Health and Safety Executive (HSE) in March 2016. Whilst we still await the final report, the HSE have provided very positive feedback and confirmed that they will not be taking any formal action against the council for any breaches or failings.
- **Apprenticeship scheme –** budget has been allocated to support the recruitment of up to five apprentices on a two year programme from August 2016 – 2018. This will provide for one apprentice mechanic in the Council's garage and up to four 'clean and green' apprentices to work flexibly and gain qualifications and experience across front-line Council services such as street cleansing, refuse and recycling, enforcement and also to experience horticultural work with our Green Spaces teams.

4. PROJECT PLAN

An outline project plan showing key dates is provided at appendix one.

Whilst the majority of residents will not notice a significant change in the services they receive the project will deliver improvements in both reliability and quality. The project will also extend collections of recycling, where possible and practical, to those areas that currently are not able to access garden waste and / or dry recycling collections at the kerbside. A start date of May 2017 is set for this 'new service' but where possible we will be introducing some changes earlier to help phase in the changes, reduce risks and improve our service offer in some areas.

5. COMMUNICATION

Effective communication with all stakeholders will be key to the successful implementation of the project and secure of public commitment to recycling. The Project Board continues to meet regularly and the views of the Cross Party Working Group and Scrutiny will form part of this communication plan.

As above, the vast majority of residents will not notice any significant changes in service delivery; the fact that the recycling is collected by the Council rather than a contractor and the fact that it is picked up by a different vehicle is rightly not something they should ordinarily be concerned about. Some residents will however be asked to present their bins and bags on a different day of the week to now and we recognise that changing habits in this regard may take a little while to settle. As we work with residents we will put in place a 'response' squad to address issues that emerge in the early weeks of implementation.

It will be important to provide simple, clear messages and calendars in terms of when and how residents should be presenting their bins, bags and boxes. And, to be very clear on what they can / cannot put in the recycling.

For those residents, where we are improving the kerbside offer, the changes should be welcomed.

The project will simplify the production of calendars reducing this from the current number of 112 different calendars down to a much more manageable number.

6. COLLECTION VEHICLES

The original aim of the Project was to introduce a different vehicle to support recycling collections which would protect the value of the recycling 'asset' by collecting it separated, at source, at the kerbside and therefore reducing contamination and presenting it to the market clean and separated. Three different types of vehicle were fully trialled in this regard in Carlisle with each presenting challenges, logistical issues and some serious operational risks (health and safety risks and performance). A different solution was therefore needed.

The Rethinking Waste Project Board has therefore approved an alternative vehicle that supports the business case and addresses the operational and health and safety risks. The preferred vehicle option is therefore likely to be a more conventional split body, compaction collection vehicle. This is further illustrated in appendix two.

7. FINANCIAL CASE

Further to the amended approach to vehicle choices, further financial work is still being developed. The revised forecasting includes all relevant service costs and predictions, as well as modelling of:

- staff numbers (drivers and loaders)
- vehicle numbers
    - purchase price – capital cost
    - running costs – revenue
- income from recycling (based on the collection regime proposed)

The soft market testing day was crucial to this process confirming that the value of the recycling collected was not significantly affected to justify the investment in the number of vehicles required should we have pursued the RRV option (Resource Recovery Vehicle).

8. RISK MANAGEMENT

The project introduces operational, financial and reputational risks which will be systematically addressed as we work through the plan. These are contained in the Directorate risk register.

9. RECOMMENDATIONS

Scrutiny is asked to note the contents of this report and to receive further updates as the project moves closer to implementation.

10. CONTRIBUTION TO THE CARLISLE PLAN PRIORITIES

Clean up Carlisle, efficiency savings, sustainability

Contact Officer: Colin Bowley **Ext:** 7124
Neighbourhood Services and Enforcement Manager

Appendices: Appendix 1: Project plan
Appendix 2: Pros and cons

Note: in compliance with section 100d of the Local Government (Access to Information) Act 1985 the report has been prepared in part from the following papers:

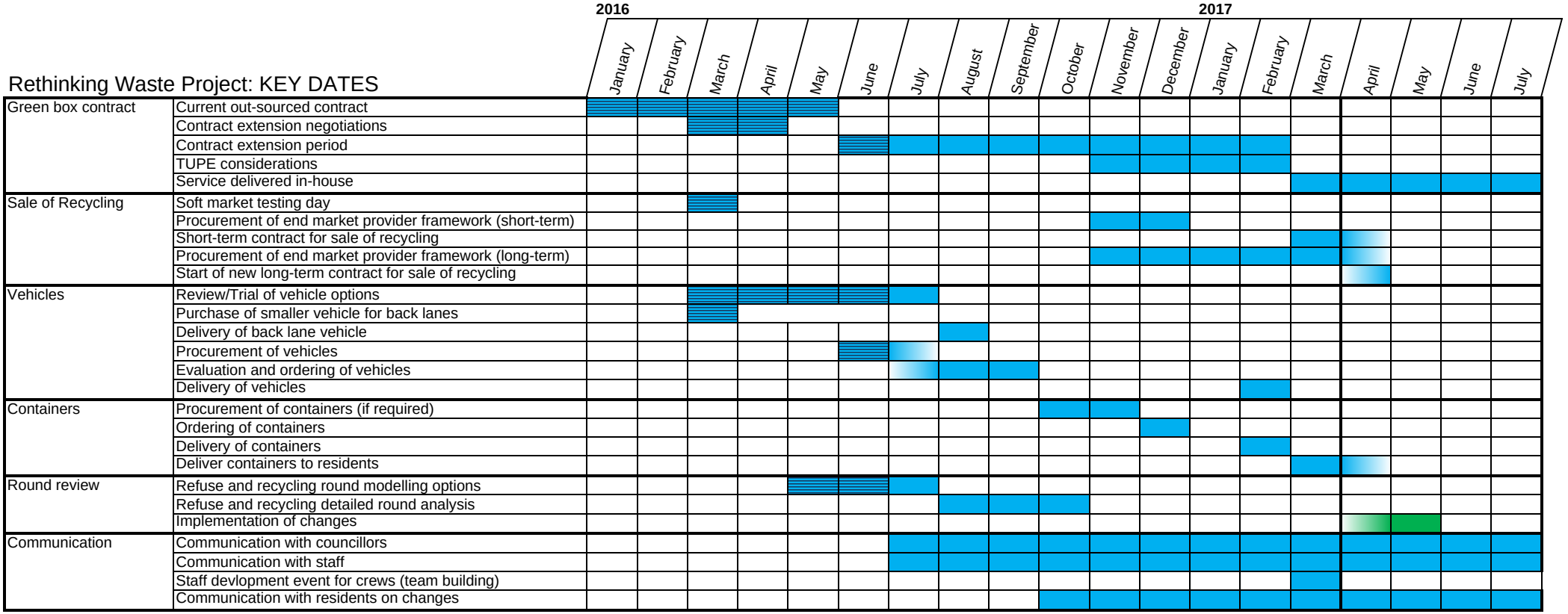
- **None**

CORPORATE IMPLICATIONS/RISKS:

Chief Executive's -
Deputy Chief Executive –
Economic Development –
Governance –
Local Environment –
Resources -

Appendix One

Rethinking Waste Project: KEY DATES



Appendix two

Pros and Cons of each Option for future recycling collection vehicles in Carlisle from April 2017

	Pros	Cons
Option 1 Romaquip RRV	• Materials collected in separate compartments (except plastic and cans) • Lower cost vehicles with possible 8-10 year life • Reduced risk of contamination as source separated by the resident • The empty green bags can be placed into the green box after collection to avoid them blowing away and to help the pavements look tidier • Option to add food waste in the future • Generates the most income from sale of recyclates	• Small compartments therefore the vehicle fills up quicker resulting in more trips to the tip • Requires twice as many vehicles and staff as other options • Slower to collect due to numerous compartments – potential to cause local disruption/delays to other road users • Significant additional fuel, maintenance, uniform, and administration costs due to more vehicles and staff • Requires residents to have another recycling container (4 in total) to separate the paper from the glass for safety reasons • Health and safety issues in relation to: o crews collecting from the middle of the road (double sided collections) o increased manual handling – lifting, reaching, stretching • Unconventional and not fully proven vehicles – life expectancy, reliability, residual values unknown • Limited future options/ lack of versatility – should markets, volumes and demands change
	• Believed to meet TEEP as majority of material is collected source separated. TEEP – Technically Economic Environmental Practical	• Cost of collection is very high raising serious questions over TEEP • Cost of collection is very high - doesn't meet the council's savings

Pros and Cons of each Option for future recycling collection vehicles in Carlisle from April 2017

Option 2
60/40 or 50/50 split back RCV
	• Materials split into two large compartments therefore less frequent trips to the tip which saves on time and fuel
	• Requires the least number of vehicles and staff compared to other options
	• Only one (or possibly none) small vehicle required as standard vehicles have rear steer so should be able to get to the majority of properties
	• Minimal change for the residents as the paper would be collected in the same container as the card
	• Reduced risk of contamination as source separated by the resident
	• The empty green bags can be placed into the green box after collection to avoid them blowing away and to help the pavements look tidier
	• Meets the required council savings as require the least capital and revenue costs
	• Likely to meet TEEP as our findings have shown that this option is the most efficient and economic way of collecting recycling.
	• Reduced health and safety risks:
	  o Reduced manual handling
	  o Reduced road risk
	• Improved speed/efficiency of collection
	• Flexible vehicles – able to support other service collections when necessary
		• Not fully source separated in vehicle (paper and card in one side and plastic, cans and glass in the other side. However the plastic and cans would be removed from the glass in the separation process by the processor
		• No option to add food waste to these vehicles
		• Generates the least income from sale of recyclates

Pros and Cons of each Option for future recycling collection vehicles in Carlisle from April 2017

Option 3
50/50 split back RCV with Pod
	• Materials split into three compartments
	• Reduced risk of contamination as source separated by the resident
	• The empty green bags can be placed into the green box after collection to avoid them blowing away and to help the pavements look tidier
	• Reduced health and safety risks:
	  o Reduced manual handling
	  o Reduced road risk
	• Improved speed/efficiency of collection compared to option 1 but slower than option 2
	• Likely to meet TEEP due to some source separation but with increased cost of collection over option 2.
		• Not fully source separated in vehicle (paper and card in one side, plastic and cans in the other side and glass in the pod. However the plastic and cans would be separated by the processor
		• No option to add food waste to these vehicles
		• The split back compartments are much smaller to allow for the pod at the front
		• These vehicles are longer and only standand size vehicles are made therefore access is likely to be an issue in some areas of Botchergate, Denton Holme and Newtown and in rural hard to reach areas
		• Financial case not as robust as option 2 and unlikely to meet the council's savings

Option 4 As is currently with separate plastic and card and green box collections but green box would be collected in a 60/40 or 50/50 split back rather than a kerbsider	• Materials collected in separate compartments (except glass and cans) • Materials split into four large compartments • Contamination is low as source separated by the resident • Likely to meet TEEP as majority is source separated but with increased cost of collection over option 2.	• No option to add food waste to these vehicles • Wasted time and fuel by sending two vehicles to each property – potential for reputation damage • Increased risk of road accidents by sending two heavy goods vehicles into the same street and vehicles may obstruct each other's collections and access for residents • Separate recycling collections mean that crews are unable to place green bags into the green box after collection • Requires residents to have another recycling container (4 in total) to separate the paper from the glass and cans for safety reasons • Financial case not as robust as option 2 and unlikely to meet the council's savings

CARLISLE CITY COUNCIL www.carlisle.gov.uk	**Environment and Economy Overview and Scrutiny Panel**	**Agenda Item:** **A.5**

Meeting Date:	28 July 2016
Portfolio:	Economy, Enterprise and Housing
Key Decision:	No
Within Policy and Budget Framework	NO
Public / Private	Public

Title:	LOCAL ENFORCEMENT PLAN
Report of:	Director of Economic Development
Report Number:	ED.28/16

Purpose / Summary:

The Executive resolved to refer the Local Enforcement Plan to E&E O&S. This report sets out an updated Local Enforcement Plan as required by the National Planning Policy Framework.

Recommendations:

That the Economy and Environment Overview and Scrutiny Panel consider and comment on the Local Enforcement Plan in response to the current consultation.

Tracking

Executive:	
Overview and Scrutiny:	
Council:	

1. BACKGROUND

1.1 The Council's existing Planning Enforcement Policy was adopted in 2007. The National Planning Policy Framework affirmed that effective enforcement is an important part of the planning system being a statutory function that delivers discretionary and proportionate action

2. PROPOSALS

2.1 Report ED.07/16 was prepared for Development Control Committee to inform them of the Council's statutory duty to have in place a Local Enforcement Plan and provide them with an opportunity to input early into the revised document. Development Control Committee resolved that the document be referred to the Council's Executive to undertaken consultation.

2.2 At its meeting on the 4th July 2016, Executive resolved to refer the Local Enforcement Plan to Economy and Environment Overview and Scrutiny Panel as part of the consultation process. Members of Development Control Committee have requested a workshop during the progression of the plan prior to its approval. Development Control Committee Report ED.07/16 is attached to this report and contains the proposed Local Enforcement Plan which will is the subject of consultation.

3. CONSULTATION

3.1 Formal consultation with planning agents and the public will take place for a period of six weeks, utilising the Council's web site/social media feeds and through notice in the Cumberland News.

4. CONCLUSION AND REASONS FOR RECOMMENDATIONS

4.1 In order that the Council has a robust Enforcement Plan in place and complies with the requirements of the National Planning Policy Framework it is essential that the Council's current Enforcement Strategy is updated. Updating the strategy requires consultation.

4.2 As part of the consultation process Economy and Environment Overview and Scrutiny Panel are requested to consider and comment on the Local Enforcement Plan.

5. CONTRIBUTION TO THE CARLISLE PLAN PRIORITIES

5.1 The Local Enforcement Plan helps to achieve two of the Carlisle Plan priorities Continue to improve the quality of our local environment and green spaces so that everyone can enjoy living, working in and visiting; and, Address current and future housing needs to protect and improve residents' quality of life

Contact Officer: **Chris Hardman** **Ext: 7502**

Appendices attached to report:

Note: in compliance with section 100d of the Local Government (Access to Information) Act 1985 the report has been prepared in part from the following papers:

- **None**

CORPORATE IMPLICATIONS/RISKS:

Chief Executive's – n/a

Deputy Chief Executive – n/a

Economic Development – Contained within the report

Governance – The Legal Services Manager has been involved in the drafting of the Local Enforcement Plan and comments are contained within the report/appendices.

Local Environment – n/a

Resources - The costs of implementing and monitoring this Local Enforcement Plan can be met from within existing base budgets under the control of the Economic Development Directorate in 2016/17.

CARLISLE CITY COUNCIL LOCAL ENFORCEMENT PLAN

1. Introduction to Planning Enforcement

1.1 The Planning system exists to control the development and use of land in the public interest. The planning system can only achieve this if planning controls are enforced when necessary. The enforcement of planning controls is therefore a fundamental part of the planning system.

1.2 The main objectives of the planning enforcement function are to remedy harm to public amenity resulting from a breach of planning control and to manage it, making sure that the integrity of the planning system is not undermined. A breach of planning control is development, or the damage or destruction of protected trees and hedgerows, carried out without the requisite consent from the Local Planning Authority (LPA).

1.3 One of the fundamental principles of planning enforcement is that of 'expediency' and the resolution of breaches of planning control is not therefore limited to taking formal action. A large number of identified breaches are in fact resolved by negotiation.

1.4 Most breaches of planning control are not criminal offences and the resulting development is unauthorised rather than illegal. Criminal offences in relation to planning only occur in the following circumstances.

- Unauthorised works to listed buildings;
- The demolition of some unlisted buildings in conservation areas;
- Causing damage to or the destruction of a tree protected by a Tree Preservation Order or within a Conservation Area;
- The destruction of hedgerows in contravention of the Hedgerow Regulations 1997;
- Displaying unauthorised advertisements;
- Failing to comply with the requirements of an Enforcement Notice or other formal notice.

1.5 This plan has been devised in accordance with the advice contained within the National Planning Policy Framework (NPPF) (March 2012) issued by the Department for Communities and Local Government which states:

“Effective enforcement is important as a means of maintaining public confidence in the planning system. Enforcement action is discretionary and local planning authorities should act proportionately in responding to suspected breaches of planning control.

“Local Planning Authorities should consider publishing a local enforcement plan to manage enforcement proactively, in a way that is appropriate to their area. This should set out how they will monitor the implementation of planning permissions, investigate alleged cases of unauthorised development and take action where it is appropriate to do so”.

The principal legislation relevant to Planning Enforcement includes:

- The Town and Country Planning Act 1990 (as amended)
- The Planning (Listed Buildings and Conservation Areas) Act 1990
- The Planning and Compulsory Purchase Act 2004
- The Town and Country Planning (Temporary Stop Notice) (England) Regulations 2005
- The Town and Country Planning (General Permitted Development) (England) Order 2015
- The Town and Country Planning (Use Classes) Order 1987 (as amended)
- The Town and Country Planning (Development Management Procedure) (England) Order 2015
- The National Planning Policy Framework 2012
- The Town and Country Planning (Control of Advertisements) (England) Regulations 2007
- The Carlisle District Local Plan 2016 – 2030 and associated Supplementary Planning Documents.
- The Human Rights Act 1998
- Planning Practice Guidance 2014
- Planning Policy Guidance 18 Enforcing Planning Control
- The Hedgerows Regulations 1997
- Town and Country Planning (Tree Preservation) (England) Regulations 2012
- Planning and Compensation Act 1991
- Regulation of Investigatory Powers Act (RIPA) 2000
- Data Protection Act 1998
- Freedom of Information Act 2000
- Policy and Criminal Evidence Act 1984
- Proceeds of Crime Act 2002
- Anti-Social Behaviour, Crime & Policing Act 2014

1.6 This Local Enforcement Plan makes it clear what those undertaking unauthorised development and those objecting to it can expect from the Local Planning Authority. The Plan also explains how the Local Planning Authority will prioritise and undertake its investigations.

2. When the Council takes action

2.1 The City Council operates its planning enforcement activities in accordance with Government advice. This means that:

- ❖ The LPA must decide whether a breach of planning control unacceptably affects the character of an area or the amenity of neighbours;
- ❖ It is usually inappropriate to take formal enforcement action against a technical breach of planning control which causes no significant harm to either the amenity of the area or the amenity of the occupiers of neighbouring premises; and
- ❖ Action should not be taken just because development has been undertaken without the necessary permission.

2.2 In deciding whether or not to take action, the LPA must consider if it is 'expedient' to do so, that is whether the action proposed to be taken is appropriate and commensurate with any alleged harm that has been or is being caused. This involves deciding whether the breach or planning control unacceptably affects public amenity or the existing use of land or buildings meriting protection in the public interest. A judgement has to be made in each case as to the seriousness of the breach and the level of any harm that is causes.

2.3 Carlisle City Council undertakes all planning enforcement action within Carlisle District with the exception of that which relates to minerals and waste development, and works on adopted highways, for which Cumbria County Council as Local Planning Authority and Highways Authority respectively are responsible.

3. Non-Planning Issues

3.1 There are often matters which concern the local communities that do not involve a breach of planning control. Such matters will be outside the remit of planning enforcement, and the LPA will not therefore take action. It may be possible to address issues such as these by way of civil action but this is a matter for the individual to pursue and is not an area where the LPA could become involved. If such matters arise during the course of our investigations, we will however seek to direct you to the relevant department or outside body where possible. Examples of issues which may not be planning matters include:

- ❖ Unauthorised use of a highway;
- ❖ Dangerous structures;
- ❖ Internal refurbishment of buildings that are not listed;
- ❖ Party wall disputes;
- ❖ Disputes regarding right to light;
- ❖ Neighbour disputes;
- ❖ Boundary/ownership disputes; and
- ❖ Pests or vermin.

4. Reporting breaches of planning control

4.1 Reports about breaches of planning control can be made through the Council's website on the Planning Enforcement page by filling out the Planning Enforcement Complaints Form

4.2 In order to deal with an alleged breach of planning control, we will need the following information:

- ❖ Your name, address and contact details (preferably an email address or telephone number to enable us to contact you more quickly);
- ❖ The address where the alleged breach is taking place;
- ❖ What the breach is;
- ❖ When the breach occurred;
- ❖ If possible or known, the name or contact details of the property/land owner.

4.3 Please be aware that anonymous complaints will not be investigated unless there is considered to be irreparable and immediate harm to public amenity, or the natural or built environment.

4.4 If complainants still wish to remain anonymous but are concerned that the alleged breach would not fall into the exception above, they will be advised to contact one of their ward councillors and refer the matter to the Council through them.

4.5 All complainants will be made aware of the LPA's final decision following the investigation.

5. If a Complaint is made about you and your property

5.1 If you are contacted about an alleged breach of planning control, you are entitled to know what the allegation is (but not who made it). You are also entitled to explain the situation from your side. If a breach is established, you will be advised of the details and how it may be put right.

5.2 Your cooperation in remedying the breach will be sought and you will be given a reasonable amount of time to do this. In some circumstances you may be invited to submit a planning application to retain the unauthorised works or development, if it is considered that planning permission may be granted. Most breaches are resolved through negotiation and discussion, and you will therefore be encouraged to maintain an open dialogue with our enforcement officers.

5.3 If you are issued with a formal notice, you will be given the precise details of the breach, the reasons for the action, the steps required to overcome the problem and the time period for compliance.

6. Power to enter land

6.1 Due to the nature of planning enforcement work, it is not normally prudent or possible to arrange a site visit. Officers will not therefore ordinarily make an appointment. This may mean that access cannot be gained on the first attempt. As such it may take longer than the initial site visit to conduct an effective investigation. Officers of the Local Planning Authority have the power to enter land for the purpose of investigating breaches of planning control and ensuring compliance with enforcement notices and other orders. This right will be exercised where there are reasonable grounds to believe a breach of planning control has taken place in order to ascertain the nature and degree of the breach. Officers will also exercise their right of access to check for compliance with any enforcement action that has been undertaken. In the case of a property being used as a dwelling house, 24 hours' notice has to be given prior to officers entering the dwelling.

6.2 Where entry is refused, a warrant may be sought. Prosecution will be considered where wilful obstruction of an officer attempting to exercise the right to entry takes place. Officers carry identity cards bearing their name, post title and photograph and details of the legislation which gives them the powers to enter land for the purposes of investigating planning enforcement complaints.

7. Confidentiality

7.1 The LPA will protect the identity of complainants and will treat such details as confidential. Although the general public will not have access to the LPA's enforcement files, if the investigations proceed to formal action, resulting in prosecution or a public inquiry, it will not be possible for the LPA to guarantee the anonymity of the complainant.

8.0 **Decision Making**

8.1 In making decisions regarding enforcement, the following principles will be followed:

- ❖ The LPA will only take enforcement action when it is expedient to do so. Enforcement action will not be instigated solely to regularise breaches of planning control.
- ❖ In considering whether to take enforcement action, the LPA will not give weight, either way, to the fact that development may have commenced.
- ❖ Decisions to take enforcement action will be taken by the Director of Economic Development, the Development Manager or the Principal Planning Officer after consultation with the Director of Governance.
- ❖ Decisions not to take enforcement action will normally be made by the planning enforcement officers in consultation with the Development Manager or the Principal Planning Officer. Reasons for not taking action will be recorded.
- ❖ The LPA will not allow prolonged negotiation to delay essential enforcement action.
- ❖ In situations where an unauthorised development may only be made acceptable by the imposition of appropriate conditions, an application will be sought to regularise the development. Where such an application is not submitted within a pre-agreed period of time, enforcement action will be pursued, with the caveat that the LPA would be prepared to grant planning permission subject to specific conditions.
- ❖ In considering whether to take enforcement action, the LPA will not give weight to non-planning considerations.
- ❖ In considering whether to take enforcement action, the LPA will have regard to the use of powers under other legislation, as such powers may be able to secure the desired outcome more efficiently.

9.0 **The City Council's Priorities**

9.1 In order to manage resources appropriately it is necessary for the LPA to adopt a priority system for responding to and dealing with alleged breaches of planning control. Complaints regarding breaches of planning control will be investigated in accordance with the following order of priority:

Priority 1 – any immediate and irreparable harm to the natural or built environment, or public safety, for example:

- ❖ Unauthorised demolition or alteration to listed buildings;
- ❖ Substantial demolition to buildings within conservation areas;
- ❖ Unauthorised development which causes demonstrable harm in the locality; or

- ❖ Unauthorised works to protected trees or hedgerows.

Priority 2 – any unauthorised development or activity which causes clear and continuous harm or danger to amenity. For example:

- ❖ Development which is unlikely to be granted planning permission without substantial modification;
- ❖ Severe nuisance such as noise at unsociable hours or for a prolonged period; or
- ❖ Dangerous vehicular access arrangements.

This may also include other unauthorised works to listed buildings or their curtilage and buildings within conservation areas.

Priority 3 – any unauthorised development or activity where there is a risk of material harm to the environment and/or some harm to residential amenity, for example:

- ❖ A breach causing concerns which may be resolved by limited modification (such as the insertion of obscure glazing or restrictions on hours of operation);
- ❖ Where works, or uses, have the potential to cause material long term damage to the environment; or
- ❖ Developments and uses which are clearly contrary to established policies or have a clear conflict with Carlisle District Local Plan 2016-2030.

Priority 4 – other breaches of planning, for example:

- ❖ Advertisements, satellite dishes and minor works including boundary treatments (except those affecting listed buildings or within conservation areas); or
- ❖ Unauthorised uses or development, which are likely to be granted planning permission if an application is submitted; or
- ❖ Untidy land; or
- ❖ Technical breaches of planning control where there is no serious harm to amenity.

9.2 The examples given above are not exhaustive but give an indication of the type of breach which may fall into each category. The priority of an alleged breach may alter during the course of an investigation if circumstances change or new information is obtained. Any change in priority will be agreed by the planning enforcement officers in consultation with the Development Manager or Principal Planning Officer.

9.3 By prioritising cases, the LPA is not condoning unauthorised development or implying that action will not be taken against other breaches of planning control.

Some breaches may however, due to their significance, take longer to investigate and resolve.

10 Keeping People Informed

10.1 Carlisle City Council is committed to treating both the person who has reported the alleged breach of planning control and the person who has allegedly breached planning control fairly. In many cases, due to lengthy and complex negotiations, failure to gain access to a property or make contact with the parties involved, or there is nothing to report and therefore parties often believe that no work is being undertaken. This is not the case. We will endeavour to keep the person who reported the alleged breach of planning control informed as regularly as possible regarding the progress of our investigations, but potential stages of notification will vary depending upon the nature and outcome of the investigations. In addition, the person who has allegedly carried out a breach of planning controls will be advised of our intended course of action before we are able to advise the person who has reported the alleged breach.

10.2 We will send all complainants an acknowledgement of their complaint within 3 working days of receipt. This will outline the main point of contact, the initial priority rating and the provisional timescales involved. It will also provide details of the City Council's website where further information, including this Plan, can be found. In addition to the acknowledgement, all letters will be fully responded to within 10 working days where possible. We will make contact with the complainant at the following stages of our investigations:

- After the site inspection advising of our findings and what our next actions will be;
- To provide an update if new information is received or deadlines are issued, for example the serving of a Planning Contravention Notice and the associated timescales, or the submission of a planning application;
- When the first phase of our investigations has been reached, and the outcome (see below);
- That the decision has been taken that enforcement action is not necessary or expedient and the case has been closed. The reasons for the decision will also be provided;
- That formal action is being taken, the nature of this action and the timescales involved;
- If an appeal is lodged; and
- The outcome following formal action.

10.3 The first phase of investigation is complete when one of the following points has been reached:

1. A case is closed because the investigation identifies that no breach has occurred;
2. A case is closed because an alleged breach has been identified and resolved by negotiation;
3. A planning or other application has been submitted following the investigation which satisfactorily addresses the breach; (Please note: a case may be re-opened if a planning application is subsequently found not to address the breach and is refused or cannot be determined within an appropriate timescale due to insufficient information);
4. A breach of planning control has been identified and an application requested but not submitted. An assessment has been made determining that it is not expedient to take enforcement action in this case at this time; or
5. A breach of planning control has been identified. An assessment has been made determining that it is expedient to take enforcement action in this case. Instructions have been issued to the Council's Legal Services section to instigate legal proceedings;
6 The damage or destruction of protected trees or hedges has been identified but it is not considered to be in the public interest to take enforcement action.

10.4 Where the first phase of investigation leads to further work (i.e. where a case remains open), this will be undertaken in accordance with timescales agreed by the enforcement officers in consultation with the Development Manager or Principal Planning Officer. The agreed timescales will take account of the nature and complexity of each case and the particular issues raised. Complainants will be kept informed of progress as detailed above.

11. Our Standards

11.1 The LPA will always seek to be:

1. Professional;
2. Courteous;
3. Consistent;
4. Fair;
5. Proportionate;
6. Responsive;
7. Honest;
8. Treat complaints in Confidence. We will not release any information that would identify a complainant. However, the Council can be required to disclose non-personal information on receipt of a request under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004.

12. **Comments and Complaints**

12.1 Carlisle City Council is committed to providing an effective and efficient planning enforcement service. However, anyone not satisfied with the service should use the Council's Complaints Policy which can be found on its website. In certain circumstances complaints can be referred to the Local Government Ombudsman who may decide to investigate further. However, the Ombudsman may ask that the Council's procedures are completed before carrying out his/her own investigation. The Ombudsman will investigate the way your case has been handled, or the Council's failure to do something but does not question a Council's decision simply because you do not agree with it. Contact details for the Ombudsman can be obtained on the Local Government Ombudsman's website.

13. **Monitoring & Review**

13.1 Details of certain complex or high profile cases are reported to the Development Control Committee quarterly. The Planning Department's Service Delivery Plan contains one local performance indicator related to enforcement, which is monitored quarterly.

Contact Us – Carlisle City Council Planning Enforcement

Telephone: (01228) 817175

EXCERPT FROM THE MINUTES OF THE EXECUTIVE HELD ON 4 JULY 2016

EX.56/16 LOCAL ENFORCEMENT PLAN
(Non Key Decision)

Portfolio Economy, Enterprise and Housing

Relevant Overview and Scrutiny Panel Environment and Economy

Subject Matter

The Economy, Enterprise and Housing Portfolio Holder submitted report ED.25/16 setting out an updated Local Enforcement Plan as required by the National Planning Policy Framework.

Members' attention was drawn to Report ED.07/16 prepared to inform the Development Control Committee of the Council's statutory duty to have in place a Local Enforcement Plan and provide them with an opportunity to input early into the revised document.

The Development Control Committee considered the matter on 12 February 2016 (Minute DC.26/16) and resolved that the document be referred to the Council's Executive to undertake consultation. Members also requested a workshop during progression of the plan prior to its approval. The above mentioned report contained the proposed Local Enforcement Plan which would be the subject of consultation.

The Economy, Enterprise and Housing Portfolio Holder stated that the Local Enforcement Plan was extremely clear and easy to understand. She added that it was proposed to consult for a period of six weeks through direct email to local agents who had regular contact with Council's planning service, utilising the Council's website/social media feeds and through notice in the Cumberland News. It was also proposed that consultation be undertaken with Overview and Scrutiny and that a Workshop be undertaken with Members of the Development Control Committee.

The Chairman of the Development Control Committee was in attendance at the meeting. She reiterated the Portfolio Holder's comments, particularly regarding the workshop session which would enable Development Control Committee Members to gain a better understanding of the processes by which Planning Officers formulated their recommendations to the Committee.

In conclusion the Economy, Enterprise and Housing Portfolio Holder moved the recommendations, which were duly seconded by the Leader.

Summary of options rejected None

DECISION

That the Executive resolved to:

(i) Refer the draft Local Enforcement Plan to Overview and Scrutiny;
(ii) Undertake a six week consultation on the Local Enforcement Plan;
(iii) Undertake a workshop for Members of Development Control Committee; and
(iv) Receive a further report to the Executive following consultation.

Reasons for Decision

In order that the Council has a robust Enforcement Plan in place and complies with the requirements of the National Planning Policy Framework it was essential that the Council's current Enforcement Strategy was updated. Updating the strategy also required consultation and therefore the report recommended that a six week consultation be undertaken