

# Carlisle

## Future Flood Risk Management

February 2019

### Background

Following Storm Desmond, flood risk management authorities were commissioned by Government to reduce flood risk not only at community level, but to look for options to reduce flood risk across the County from Source to Sea. This means we have taken a new approach, working at a catchment scale to integrate land management, development and resilience from the tops of the fells down to the coast. In order for us to deliver flood risk benefits across the County in this way we are now part of an established partnership called Cumbria Strategic Flood Partnership (CSFP).

### What does Cumbria Strategic Flood Partnership do?

The CSFP aims to lead, coordinate and monitor the management of flood risk across the County. This Partnership brings together Flood Risk Management Authorities including the Environment Agency, Cumbria County Council, District Councils, United Utilities and representation from other organisations including land managers and community groups who have an interest in, or responsibility for, flood risk management.

The CSFP is structured over two levels – the Board (strategic level) and Catchment Management Groups (operational/delivery level). The Board takes an overview of the whole Partnership, setting the direction and ensuring the three Catchment Management Groups deliver their objectives. The Board is currently chaired by Cumbria County Council and the Eden Catchment Management Group is chaired by Eden Rivers Trust.

### Cumbria Strategic Flood Partnership Community Representation

A key objective of this Partnership is to ensure communities are represented at both a strategic level and at an operational level. The CSFP has appointed 6 community representatives (2 for each catchment area) to be a member of the Board and Catchment Management Group.

Your community Board representative for the Eden catchment is John Kelsall and your Catchment Management Group representative is Richard Milne.

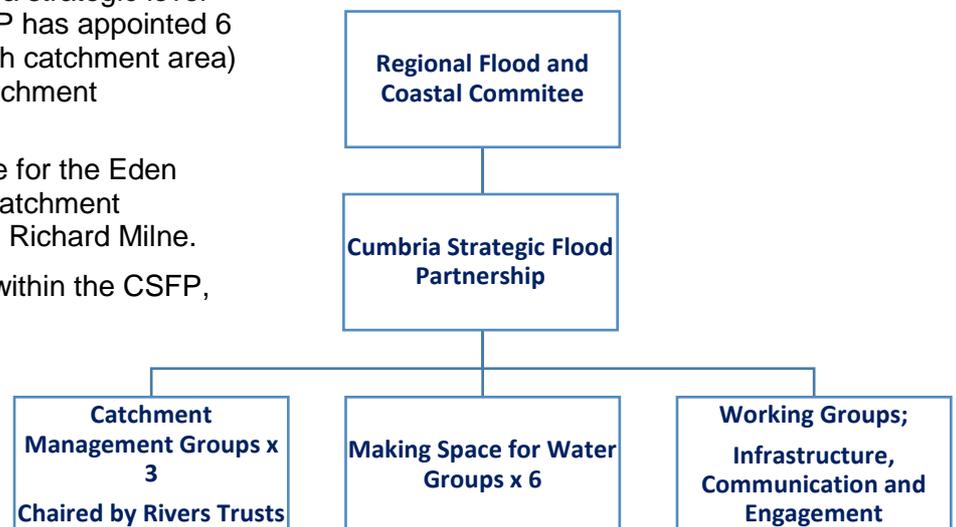
If you have any queries on their role within the CSFP, you can contact them on:

John Kelsall

[john@phoenixarchitects.co.uk](mailto:john@phoenixarchitects.co.uk)

Richard Milne

[richardmilne\\_uk@btopenworld.com](mailto:richardmilne_uk@btopenworld.com)



For more information on the CSFP visit [www.cumbriastrategicfloodpartnership.org](http://www.cumbriastrategicfloodpartnership.org)

or email [CSFP@cumbria.gov.uk](mailto:CSFP@cumbria.gov.uk)

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### What does this mean for Carlisle?

Our aim is to improve the level of flood protection to as many properties as possible across the city and design and build an improved Flood Risk Management Scheme that will provide protection against flood levels reached in Storm Desmond and include allowances for climate change.

It is envisaged that the Flood Risk Management Scheme will be delivered in 4 phases. The phased approach will better defend the largest number of residents in the first phase without adversely impacting others. Overlapping of phases is planned such that the second phase may commence without the first being complete. These phases have been outlined below in more detail.

**Phase 1** – Melbourne Park, Durranshill and Tesco area (Rivers Eden & Petteril) (Shown in Red)

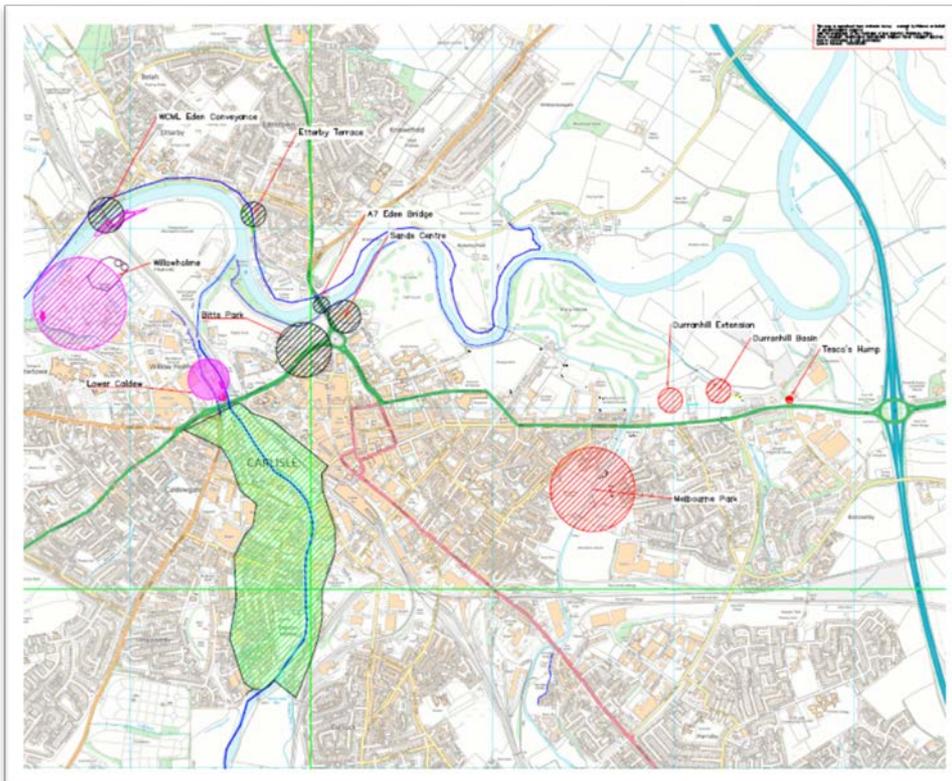
**Phase 2** – Sands Centre, Bitts Park, Etterby Terrace, West Coast Mainline Eden Crossing, A7 (Eden Bridge) conveyance area (River Eden) (Shown in Black)

**Phase 3** – Willowhome, Maltings and Caldew downstream of A595 (River Eden & Caldew) (Shown in Pink)

**Phase 4** - Caldew upstream of A595 to Denton Holme and Harraby Green (River Caldew & Petteril) (Shown in Green)

We have reviewed a number of options, with each option being assessed on Economic viability, Technical feasibility, Environmental sustainability and Community support. The preferred options for Carlisle are being finalised and as outlined in the plans below are expected to include extending and raising existing flood defences and improving conveyance of flood water through the city

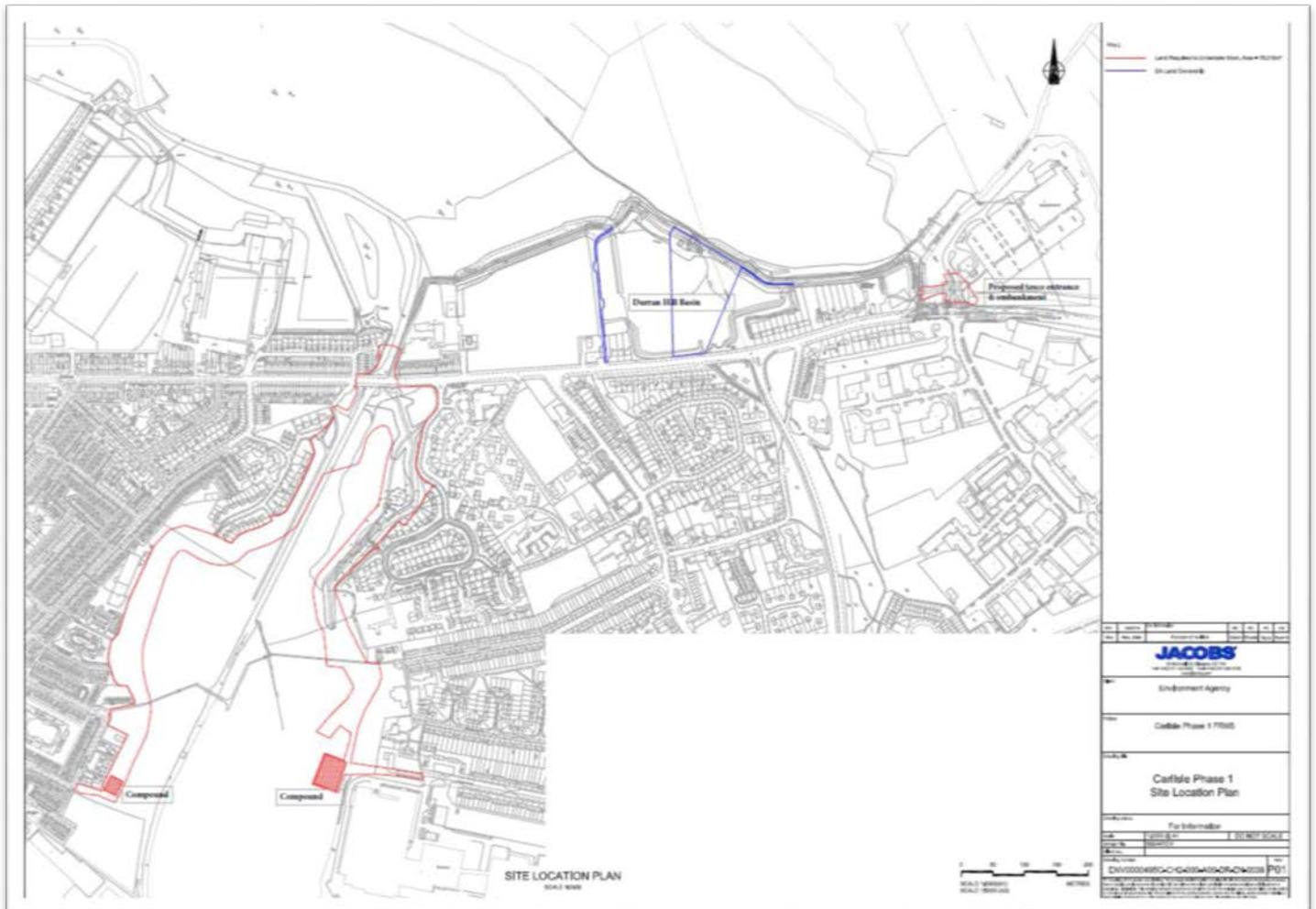
The Environment Agency is also currently working to deliver flood risk management works on Gosling Sike.



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### Phase One - Melbourne Park & Durranhill: (shown in red)



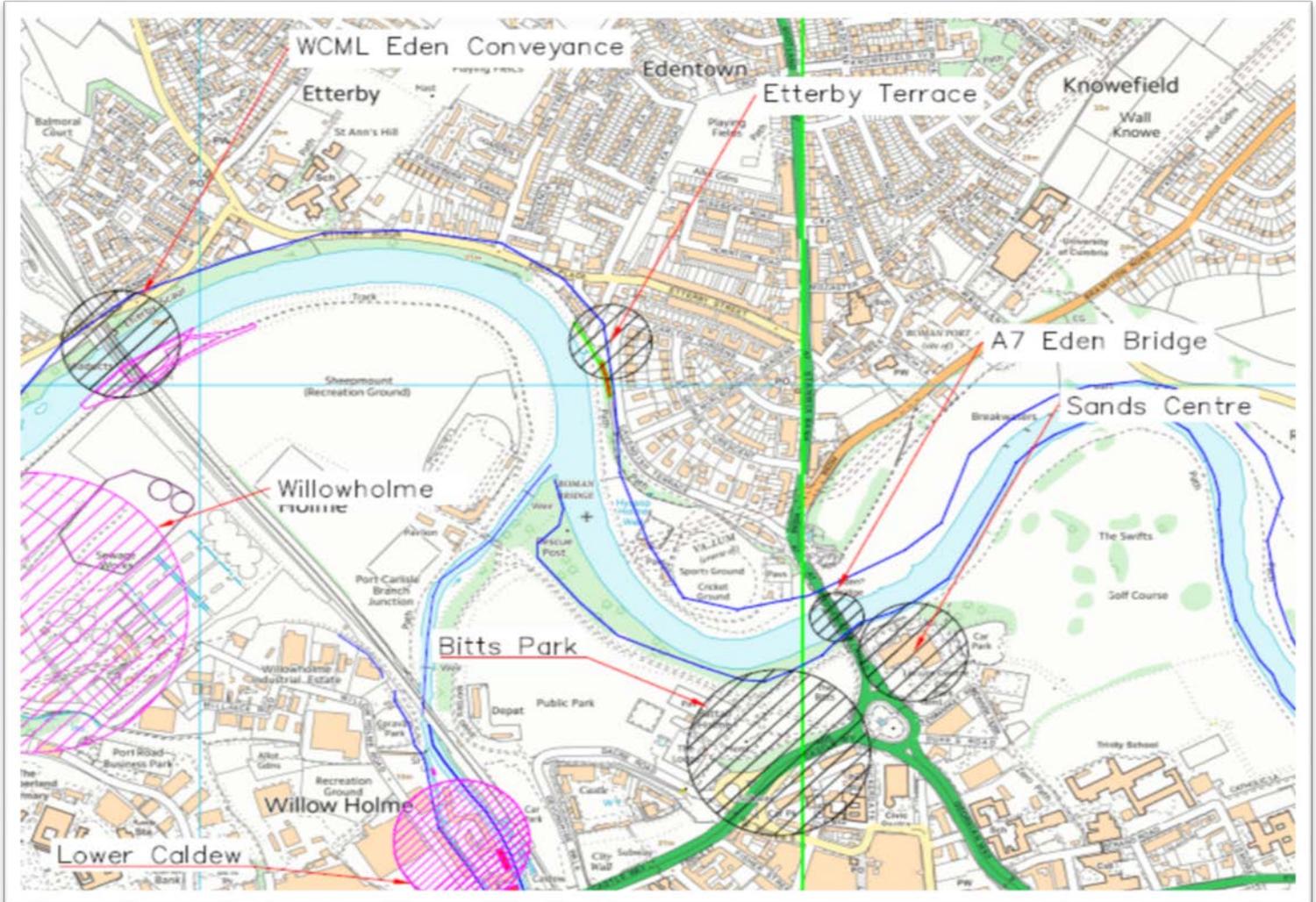
Phase 1 of the flood risk management scheme will involve extending and raising of existing flood defences to protect properties from flooding to the levels observed in Storm Desmond upstream and downstream of Botcherby Bridge on the River Petteril. The work will consist of:-

- Raising and extending existing Melbourne Park embankments to improve protection to properties.
- Downstream of Botcherby bridge – scour protection, works to flood walls and flood gates;
- Botcherby Bridge – concrete repairs, smoothing of flow path, gravel management improvements; in partnership with Carlisle City Council.
- Existing embankments raised by approximately 500mm and extended upstream to tie into higher ground
- Upgrades to Durranhill storage basin.
- Footpath and road entrance to Tesco supermarket resurface and raised by approximately 300mm
- Seepage cut-off along length of new embankments (takes various forms)

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**Phase Two – Sands Centre, Bitts Park, Etterby Terrace, WCML Eden crossing, A7: (shown in black)**



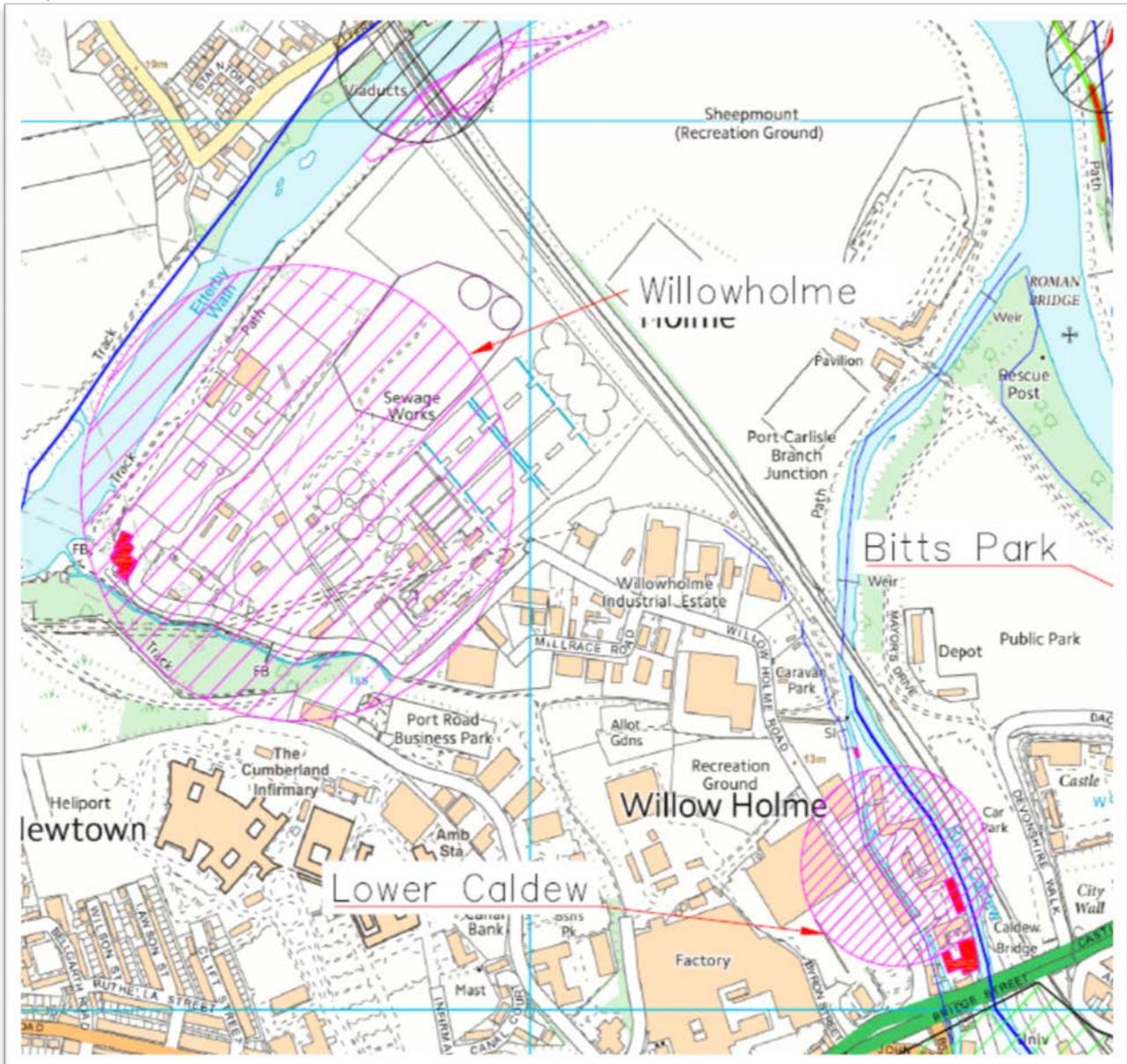
We are currently refining the detail for Phase 2 (shown in black), however we aim to undertake improvements to the existing flood defences from the Sands Centre to the West Coast Mainline crossing including Bitts Park and Etterby Terrace areas. Protecting against the levels reached during Storm Desmond the works will consist of:-

- Raising existing walls around the Sands Centre.
- Conveyance improvements at the A7 bridge in partnership with Cumbria County Council
- Raising the existing Bitts Park embankment and walls and Darce Road road raising.
- Raising and extending the existing embankment and wall at Etterby Terrace.
- Conveyance improvements at West Coast Mainline Bridge in Partnership with Network Rail to improve flood flows.

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Phase Three – Willowholme, Maltings and Caldew downstream of A595: (shown in pink)



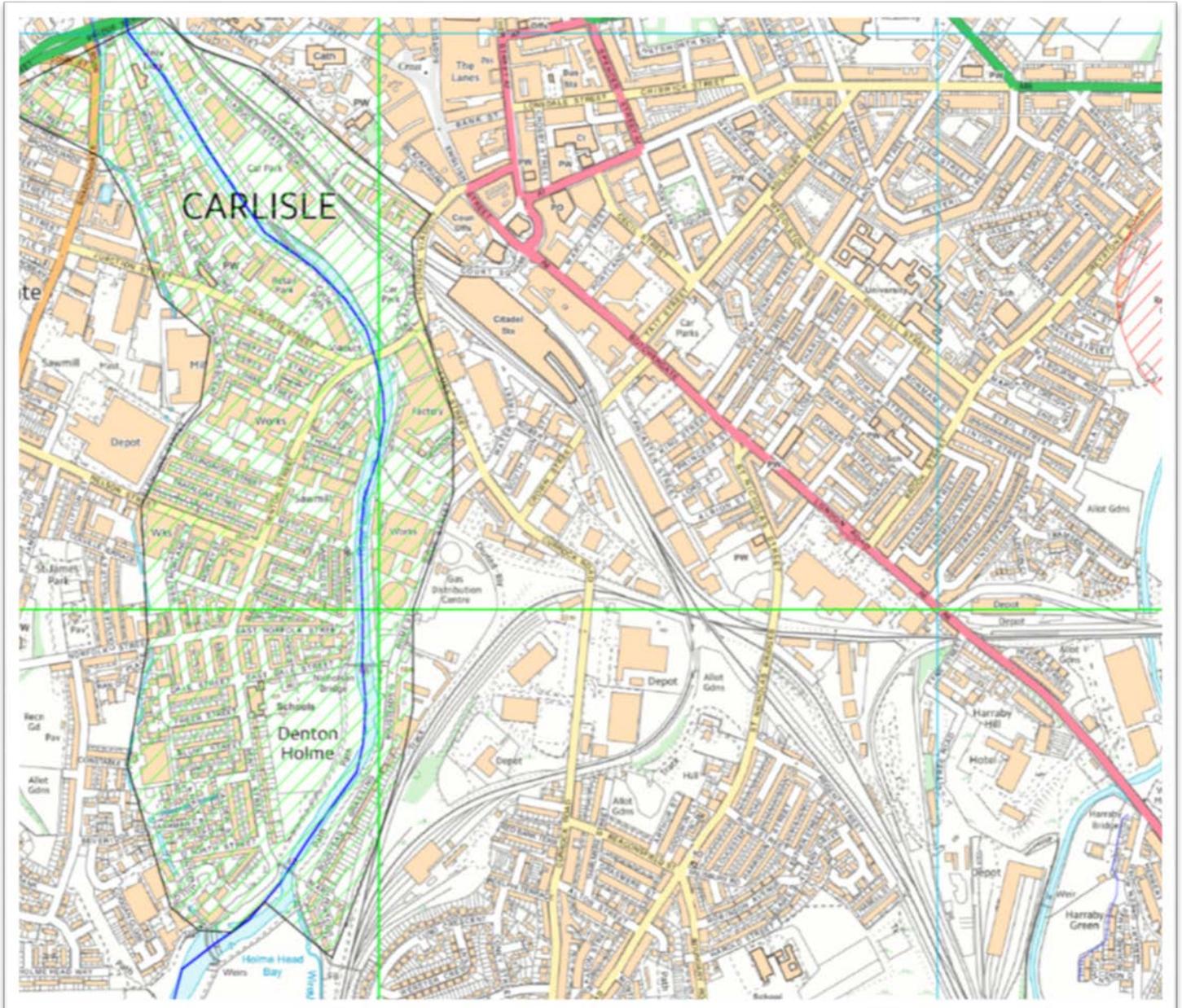
We are currently refining the detail for Phase 3 (shown in pink), but we can confirm that we will aim to undertake improvement works to the existing flood risk management scheme in the areas of Willowholme, Maltings and Caldew downstream of A595. The work will consist of:-

- Potential flow diversion in partnership with Network Rail and United Utilities
- Raising existing flood defences to defend to a Storm Desmond level.

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**Phase Four – Caldew upstream of A595 to Denton Holme and Harraby Green: (shown in green)**



We are currently refining the detail for Phase 4 (shown in green), but we can confirm we will aim to undertake improvement works to the existing flood risk management scheme that protects properties in the area of Caldew upstream of A595 to Denton Holme and Harraby Green on the River Petteril. The work will consist of:-

- Raising existing defences to ensure this area is protected to the same standard as the rest of the city

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### Frequently Asked Questions:

#### What is the current standard of protection in the city?

- The scheme that was constructed to protect the city post the widespread flooding in 2005 provides protection to a 0.5% annual exceedance probability (1 in 200 year return period event).
- This is one of the highest standards of protection against flooding outside London and York but clearly it wasn't sufficient to prevent flooding during Storm Desmond.
- This scheme has protected the city against flooding on a number of occasions including June 2012 when the River Caldew reached its highest recorded level through Denton Holme

#### Does the scheme protect against flooding from another storm Desmond, which was approximately a 1 in 300 year flood event. (0.33% chance of flooding in any year)

- The options being presented for phase 1 have been designed to protect the city to the level equivalent to those that were observed in Storm Desmond.
- The Environment Agency is committed to identifying options that provide the same standard of protection for the future phases in the city.

#### Have you considered all possible options to reduce flood risk?

- We have looked at many different options and combinations of options for Carlisle, as well as having three public consultations where we have consulted and shared the identification of these. This preferred combination of options for phase 1 has been selected as the most economically viable, technically feasible, environmentally sustainable and socially acceptable of all the options considered.

#### Do we understand the role of bridges in flooding in the city?

- Previous engagement with the community during drop-ins and feedback from the Carlisle Flood Action Group (CFLAG) raised concerns around the role of bridges in the flooding observed in Storm Desmond.
- The Environment Agency has collected a lot of data around the bridges including the observed levels during Storm Desmond and additional modelling.
- While there is an afflux (change in water level from upstream to downstream) across a number of the bridge structures this wasn't the driver for much of the flooding observed in the city and working to reduce this afflux effect hasn't necessarily come out as the most effective option to manage the flood risk in the city. We are looking to improve conveyance at the WCML Bridge and the A7 Bridge. Our proposals for Botcherby Bridge will include works to make gravel management more straight forward and minor conveyance improvements to the bridge structure and upstream channel as it approaches the bridge.
- Our work to date has indicated that the most effective way to manage flood risk in the city is to raise existing walls and embankments where necessary and improve conveyance at those bridges where it is a viable option.

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### **How are you co-ordinating with the other work that is proposed Warwick Road in 2019 - 2020 and what about construction concerns regarding traffic and road closures?**

- We are aware that a number of different organisations are proposing to undertake works in the Warwick Road area in the near future. We are working with them in order to understand their programmes and to see if there are opportunities for co-ordinating these such that we are minimising disruption in this part of the city.
- Temporary footpath and road closures and diversions may be required to complete the work in some locations as well as keeping the public safe.

### **How have you identified the phases?**

- In order to make delivery of the work required across the city more manageable and reduce the impact on the city the work will be undertaken in phases. The phases have been identified such that the number of properties where the flood risk is reduced is maximised while the risk to different parts of the city is not increased during and after the completion of that phase.

### **What is being done to understand the risk of flooding from surface water and the drains?**

- United Utilities and Cumbria County Council are responsible for the surface water and drains. The industry design standard set by government for drains is 1 in 30 years, local rainfall events that exceed this rarity may cause localised flooding. It is not technically or economically possible to dig up all of Carlisle and upsize all the drains as part of the scheme. We are working with Cumbria County Council and United Utilities to better understand the 'hotspot' locations where property may be affected by flooding to identify what improvements can be made.
- The Section 19 report post Storm Desmond identified surcharging of the drainage system resulting in ponding water on the dry side of the defences prior to inundation due to the overtopping and by-passing of the flood defences. The preferred option includes the provision of seepage control which is intended to reduce the likelihood of high river levels resulting in a residual risk being realised on the dry side of the embankments.
- These measures will reduce the volume of water entering the local drainage network and increase the period of time during which United Utilities' pumping station (at Botcherby Bridge for example) will operate during extreme floods by reducing the likelihood of it becoming inundated with flood water.

### **Are any environmental mitigation works proposed?**

- We are working with landowners to see what environmental mitigation could be realised as part of the delivery of phase 1. At present we are working with elected members, land owners and others to identify opportunities for enhancement and mitigation in the Melbourne Park area of the City. With every scheme we will replant five trees for every one tree we remove. Trees would be replanted as close as we can to where they were removed and we will use larger semi mature trees to replant in the places people see and use the most. However there are no plans for extensive removal of trees in the city in phase 1.

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### Are you increasing the risk of flooding to other properties through a phased approach?

- Understanding how risk changes in different parts of a community during the delivery of a large complex scheme is important. The phasing we have identified doesn't change risk to properties on subsequent phases. Our phasing is driven to prevent flood risk worsening in other areas and our first phase targets the greatest number of properties affected by Desmond.

### Why are you not using natural flood management (NFM) to slow and store the water upstream?

- NFM is a longer term solution which could help to address climate change or add resilience to an existing scheme. Where possible it should be used in conjunction with other more traditional engineered measures to help reduce flood risk. We have already identified several natural flood management projects in the Eden catchment that we have been supporting and will continue to support. For further information visit [www.cumbriastrategicfloodpartnership.org](http://www.cumbriastrategicfloodpartnership.org)

### What about the appearance of the flood defences?

- Careful consideration has been given to the alignment and visual appearance of the flood defences recognising the sensitivity of the local area.

### What about climate change?

- The design of the scheme has considered how flows will change in the future in line with the climate change projections presented in UKCP 09 (current EA guidance and DEFRA guidance). The options we are considering will continue to defend the community to a Storm Desmond type event for the duration of the scheme's lifetime (into the 2080s).

### What next?

We submitted the plans to Carlisle City Council for Planning permission for Phase 1 on the 20<sup>th</sup> February 2019. Through the planning process there will be also a further opportunity to provide formal feedback on the planned proposals. Detailed information on the plans will be made available via Carlisle City Council planning portal. We aim to have detailed plans ready for submission for planning to Carlisle City Council for Phase 2 in Summer 2019 and for Phase 3 in due course.

If planning permission is granted we aim to start construction on Phase 1 and some elements of the in-river works of phase 2 from early Summer 2019

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### Contacting the Environment Agency

If you would like to contact the Environment Agency about future flood risk management you can email [CMBLNC-PSO@environment-agency.gov.uk](mailto:CMBLNC-PSO@environment-agency.gov.uk). If your query relates to community or personal household level resilience please contact [clfloodresilience@environment-agency.gov.uk](mailto:clfloodresilience@environment-agency.gov.uk).

### Be flood ready

We will never be able to guarantee a completely flood-free future, and so we encourage anyone living or working in a flood risk area to be aware and to be prepared. We can support you by; signing you up to receive free **flood warnings**, helping you to produce a **personal flood plan**, offering **property resistance and resilience** information and supporting the formation and ongoing work of a **community flood action group**.

It is important that you are prepared for flooding and we encourage you to take 4 simple steps:-

1. Sign up to Floodline to receive free flood warnings - Over 30% of properties within Carlisle have not yet registered to receive flood warnings. The Flood Warning Service is a free system which is used to warn you of imminent flooding to land and property.
2. Know what to do when a flood warning is issued. Have a personal flood plan for you and your family.
3. Keep an eye on the situation. You can view a 5 day weather forecast and monitor the river levels online.
4. Keep up to date with early warnings of heavy rain which could lead to flooding by registering for Cumbria Community Messaging. This is a free e-mail service and is complementary to our Flood Warning Service. To register visit [www.cumbriacommunitymessaging.co.uk](http://www.cumbriacommunitymessaging.co.uk)

**For information on the above, visit**  
<https://flood-warning-information.service.gov.uk/warnings> **or for more general**  
**flooding advice and information visit** [www.thefloodhub.co.uk](http://www.thefloodhub.co.uk)  
**or ring Floodline on 0345 988 1188**

