



# Report of the Strategic Director of Place to the meeting of Regeneration and Environment Overview and Scrutiny Committee to be held on 28 November 2023

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## Subject:

Water Management and Resilience in the Bradford District

## Summary statement:

The Environment and Waste Management Overview Scrutiny Committee undertook a wider scrutiny review into water management across the district following the devastating winter 2015 floods. The Water Management Scrutiny Review was endorsed by the Environment and Waste Management Overview Scrutiny Committee at their meeting on 4<sup>th</sup> July 2017 where it was recommended to be considered by the Corporate Overview and Scrutiny Committee in their meeting on the 26<sup>th</sup> October 2017 where it was subsequently endorsed.

Following its adoption, The Water Management Scrutiny Review included twenty-six recommendations and the report has been brought to the committee on an annual basis to highlight progress made against each recommendation. The majority of the recommendations raised in the original Water Management Scrutiny Review Report are now deemed satisfied.

At the October 2022 meeting it was resolved That Bradford Council's Regeneration and Environment Overview and Scrutiny Committee receives a report back before the end of October 2023 which provides an update to the Councils progress of all Water Management and Resilience initiatives within the district.

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## **EQUALITY & DIVERSITY:**

The public sector equality duty in s149 of the Equalities Act applies to the Council in the exercise of its functions. Those functions will include most, if not all, of the proposals and other measures referred to in this report. The duty is to “have due regard to the need to (a) eliminate discrimination, harassment, victimisation and any other conduct that is prohibited under [the 2010 Act], (b) advance equality of opportunity between persons who share relevant protected characteristics and persons who do not share it.”. In summary, this includes the need to remove or minimise disadvantages suffered by persons that are connected to that relevant protected characteristic and taking steps to meet the needs of persons who do not share it and encouraging persons who share a relevant protected characteristic to take account of disabled person’s disabilities and makes it clear that compliance with the duties ‘may involve treating some persons more favourably than others’. It is evidence that all of the schemes and proposals referred to in this report have the potential to impact on persons who share one of more of the relevant protected characteristics.

## 1. SUMMARY

The Environment and Waste Management Overview Scrutiny Committee undertook a wider scrutiny review into water management across the district following the devastating winter 2015 floods. The Water Management Scrutiny Review was endorsed by the Environment and Waste Management Overview Scrutiny Committee at their meeting on 4<sup>th</sup> July 2017 where it was recommended to be considered by the Corporate Overview and Scrutiny Committee in their meeting on the 26<sup>th</sup> October 2017 where it was subsequently endorsed.

Following its adoption, The Water Management Scrutiny Review included twenty-six recommendations and The report has been brought to the committee on an annual basis to highlight progress made against each recommendation. The majority of the recommendations raised in the original Water Management Scrutiny Review Report are now deemed satisfied or are dealt with as day to day activities by a host of council services. In this respect, the original report has achieved its objectives.

Within the October 2022 meeting it was resolved That Bradford Council's Regeneration and Environment Overview and Scrutiny Committee receives a report back before the end of October 2023 which provides an update to the Council's progress of all Water Management and Resilience initiatives within the district.

## 2. BACKGROUND

The floods of December 2015 inundated over 1,000 homes and businesses across a wide swathe of Bradford District and turned the lives of many hundreds of local people upside down. The cost of the damage to residential and commercial property is estimated to have been around £34 million. The broader social, environmental and economic impacts were even greater in scope as residents struggled to cope with the upheaval to their everyday lives through the months that followed.

Water management in Bradford was again unfortunately put to the test in 2020 by the wettest February on record when Storm Ciara and Storm Dennis caused widespread incidents across the district. Approximately 300mm of rainfall fell in a four-week period. To put this in context the average annual rainfall for Bradford is circa 950mm. This caused a reported 71 residential properties and approximately 60 businesses to succumb to internal flooding. This also caused four schools to flood and be forced to close plus large lengths of the highway network becoming impassable. In total over 900 flooding incidents were reported through the contact centre during the period. This was a stark reminder of the importance of flood risk and water management within the district.

In January and February of 2021, several storms caused widespread disruption and incidents across the district. These events again highlighted where existing processes in the response to flood risk had improved but also where further work was required.

Storm Franklin brought around 90mm of rainfall in a 24 hour period during February 2022. The Rainfall landing on an already saturated catchment causing local drainage infrastructure to stress and at times be overwhelmed. To put this level of rainfall in context, the average monthly amount of rainfall for the whole of February is 75mm, since records began.

The larger main rivers the River Aire, River Worth and River Wharfe peaked at high levels but no reports of property flooding from these river systems were raised. There were a large number incidents recorded from non-main river and surface water flooding, (including a landslip on Westlea Avenue, Riddlesden and surface water flooding in Low Moor and in East Morton). In total the Council received 60 incidents to investigate surface water flooding of properties. Fifteen properties were recorded to succumb to internal flooding.

Articulate road closures were put in place due to surface water flooding of the highway network and many minor roads and rights of ways were also unpassable. Power cuts affecting more than 1000 properties in the district. The Thackley Railway Tunnel (Airedale Line) flooded (water seeping through roof and walls) – which resulted in the Leeds / Bradford / Ilkley / Shipley lines being closed temporarily.

The impact of flash flooding in urban areas has been felt within our communities. Horton Grange is located to the west of Bradford city centre is an urban inner-city settlement consisting predominately of residential, terraced properties with local businesses present in the area. There also a place of worship and a NHS GP practice within the study area. Flood risk to the study area is generated by high intensity surface water overland flows and this request is following two recent flood events that have overwhelmed the local drainage systems leading to property flooding. These events occurred in October 2022, and more recently in June 2023, where on both occasions around 20 properties reported internal flooding. These two relatively concurrent flood events have escalated a need for a scheme to be progressed urgently.

The flood events over the last 8 years have highlighted that Water Management is still a key challenge and how the Council engages and approaches this challenge over the coming years will be critical to providing a prosperous and sustainable district that allows individuals, households and businesses to adapt, change and innovate to address the tests presented by climate change. High quality water management requires a multitude of organisations and stakeholders to collaborate effectively.

### **3. REPORT ISSUES**

#### **Bradford Council's Capital Flood Risk Management Programme**

Since the major floods in 2015 the Council have recognised the need for a long-term strategic approach to managing flood risk across our district. The Council have worked with the Environment Agency and Yorkshire Water to scope and develop a Bradford Flood Programme Board ('the Board'). The Board objectives alongside ongoing scheme development, is a priority to focus on identifying and delivering cost-beneficial solutions for communities at risk of flooding within the district. The Board was established in January 2017 and have progressed and supported the emergence of a capital flood risk programme of works for the district. The work conducted by the Council in recent years has provided the tools and knowledge to develop a healthy and progressive capital flood risk management programme. Not only have projects advanced within areas initially impacted by Storm Eva in 2015, but largely due to the many partnerships and relationships formed in creating the programme, this has provided a springboard towards unearthing a multitude of multi organisation flood risk management schemes in the district.

The Board was established in January 2017 and have progressed and supported the emergence of a capital flood risk programme of works for the District. Presented in Appendix 1 is a copy of the latest Bradford Council Capital Flood Risk Programme. This programme details the capital works schemes to better protect properties from flood risk in the district.

The programme illustrates the spread of projects between the Aire and Wharfe Catchment. The programme shows the forecasted delivery of projects and where currently funding gaps exist based on their eligibility to attract Flood Defence Grant in Aid from the Department for Environment, Food and Rural Affairs (DEFRA), this being the main source of government funding to fund projects to reduce flood risk. Since last year's meeting two schemes have been delivered with the programme. Emergency repairs to a culvert structure were progressed under the Bradford Live project in the city centre and a scheme to reduce persistent highway and property flooding on Redcar Lane in Keighley were delivered. Tender documentation is currently being prepared to deliver a scheme at Skipton Road in Keighley following the successful application for Flood Defence Grant in Aid funding to the Environment Agency.

It is essential that the schemes in the Councils programme continue to be progressed collaboratively to ensure our high-risk communities are resilient to future climate changes and an increased risk of flooding.

### **Community Engagement**

There is a need for Bradford Council to play a part in helping to develop the ability of communities to look after themselves to a greater degree than they currently do. Bradford Council's Emergency Planning Team have developed local Flood and Emergency plans with Parish and Town Councils within Bradford District. Bradford Council have provided Flood Packs for properties at risk and have secured funding for river stewardship works in collaboration with partners and community groups through the Bradford Flood Programme Board Flood Resilience Group. Different communities are at various stages with their emergency plans. A brief description of the plans in place are below.

Addingham – early engagement, template plan supplied.

Baildon – group established, we are re-engaging with them to ensure plans etc. are in place and appropriate.

Bingley – plan updated and at training stage with them.

Bingley Rural – early engagement

Harden – plan updated, and training delivered.

Haworth, Cross Roads and Stanbury – plan in progress, proposed flood barrier for Haworth.

Menston – template plan with them for development.

Keighley East – Initial engagement, template plan left with them.

Keighley Central - Initial engagement, template plan left with them.

Oxenhope – Plan in place, active group, with small number of resources.

Shipley – Initial engagement, template plan left with them.

Silsden – Plan in place, active group (coming back online asap) flood barrier in production, training TBA

Wilsden – Plan reviewed and due to deliver training soon TBC

Wyke, Low Moor and Royds – working with local Cllrs on identifying centres to be used

as reception centres to support local evacuations.

The River Aire and its tributaries in Bradford are extensive and flood risk is widespread. There is a need to engage with multiple communities within Bradford District regarding the risk they face and their role in mitigating that risk and being more resilient. The Council recognise that this a considerable undertaking and something that the Council do not have the resources to do on what we would consider to be an effective level. This is however what we need our communities to be. Bradford Council have facilitated match funding to support the River Aire Care project. River Aire Care provides a mechanism to support residents and businesses to deliver direct improvements to their communities. This in turn provides a sense of wellbeing, pride and ownership of their immediate environment. River Aire Care is a programme of raising community resilience to flooding throughout the River Aire catchment through awareness raising, community clean ups, volunteer opportunities, group support and an apprenticeship for a young people/person. This programme builds on existing work and ensures its continuity as future funding plans are developed.

A staff member from the Aire Rivers Trust will support local volunteer groups to raise flood awareness, care for their rivers and improve local biodiversity. These include supporting existing groups (i.e. River Worth Friends) and helping newer ones grow (i.e. Friends of Silsden Beck). This project will grow capacity for environmental conservation and river stewardship within the catchment and within the Trust, through a Countryside Worker apprenticeship.

The project will provide outreach work and awareness raising with targeted communities, such those in the vicinity of the Keighley and Stockbridge Scheme, to improve flood resilience. This will include the updating of a flood awareness pack for the Bradford district.

### **Climate Change and Adaption**

According to the 2018 UK Climate Change Projections average sea level could increase by over a metre by the end of the century (Met Office, 2019) and at 2C global warming without adaptation between 10% and 125% more people could be affected by river flooding worldwide. Limiting global warming to 1.5C halves the increase in flooding impact (Met Office 2018) underlining the importance of acting now to adapt to flooding and coastal change. According to the World Health Organisation climate change is one of the greatest threats to global health in the 21st century (WHO, 2015). The climate emergency is the defining issue for local government over the next ten to twenty years and The City of Bradford Metropolitan District Council declared a Climate Emergency in 2019 and joined the Leeds City Region Climate Coalition which is aiming for a net zero carbon region by 2038.

A climate resilient district will not be effectively delivered by Bradford Council working on their own. We all need to take action now so that we are ready for what the future will bring. We need all Risk Management Authority's (RMA's), individuals, communities, the third sector, businesses, farmers, land managers and infrastructure providers to contribute to planning and adapting to future flooding in the authority area so that Bradford District is a flood resilient district. The government's Environment Bill (Parliament 2020a) and Agriculture Bill (Parliament UK, 2020b) recognise that we need to make nature's power part of our solution and support farmers and land managers to take a more integrated approach to flood risk and water resource management. Our

work to date has enabled us to develop good working partnerships and it is our intention to grow those partnerships further to enable us to deliver the flood alleviation projects and resilience measures that the district needs. The consultation on the emerging [National Resilience Strategy](#) (December 2021) reports that most respondents believe that more can be done to assess (82%, 268 respondents) and communicate (80%, 261) risk, whilst 76% (246) consider that everyone has a part to play in improving the UK's resilience.

The Council are currently updating its Strategic Flood Risk Assessment (SFRA) in line with new guidance released this year. Within the update maps of predicted flood risk will be published from detailed computer flood mapping. This will inform the flood risk aspects and policies of the site allocations process. The latest climate change allowances will be considered to identify flood risk extents from all sources of flooding. The mapping outputs will assess the effects of climate change on all sources of flooding and identify areas where it is expected climate change to increase flood risk. The maps will also determine where the effects of climate change will make existing development unsustainable. This process will help identify any development that may need to be relocated to sustainable locations.

The National Planning Policy Framework (NPPF) sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. Making allowances for climate change in flood risk assessments is a way of achieving this. NPPF and supporting planning practice guidance on flood risk and coastal change explain when and how flood risk assessments should be used. This includes demonstrating how flood risk will be managed now and over the development's lifetime taking climate change into account. Local planning authorities refer to the published guidelines when preparing local plans and considering planning applications.

Advice on climate change was previously set at a national level however research suggested that future guidelines for changes to peak river flows as a result of climate change might be more appropriate if considered on a regional scale. New allowances were produced by the EA in April 2016 (Flood Risk Assessments: Climate Change Allowances) and there are different allowances for different periods of time over the next century. Bradford District lies within the Humber river basin district and allowances for changes to peak river flows range from 10 to 50%. Peak rainfall intensity is set nationally at a range of 5 to 40%.

It is imperative that the effects of more extreme flooding in Bradford District are mitigated against, and plans and schemes are developed to better manage and adapt to any increased risk of local flooding as a result of climate change. This affects the functions of all RMA's and all Council departments.

### **Working with Natural Processes (WwNP) in Bradford**

Working with Natural Processes (WwNP) or Natural Flood Management (NFM) is a type of flood risk management used to protect, restore and re-naturalise the function of catchments and rivers to reduce flood and coastal erosion risk.

WwNP has the potential to provide environmentally sensitive approaches to reduce flood risk in areas where hard flood defences are not feasible and to increase the lifespan of existing flood defences. WwNP and NFM are used interchangeably in the UK though the term WwNP is now used by Defra. Bradford Council work with RMA's and other partners to deliver WwNP projects across the Bradford district.

Bradford Council have contributed to the evidence base for WwNP by undertaking pilot projects in Bradford District on both the Aire and Wharfe Catchments on Harden Moor and Ilkley Moor. Further detail so these projects are included in Appendix 2. Whilst the primary objective is flood risk reduction, the nature of WwNP means that it is multidisciplinary and requires input from multiple fields to ensure that measures enhance the existing environment rather than irrevocably changing it to the detriment of other environmental, social or economic objectives. For these reasons, WwNP projects are very much partnership efforts, from the landowners to the communities, to organisations already working in the area and to the organisations delivering the projects. For Bradford Council, WwNP projects as a landowner requires the Land Drainage team to work with Countryside and Rights of Way and Parks and Green Spaces Team.

Bradford Council is a partner in the Natural Environment Research Council funded Yorkshire Integrated Catchment Solutions Programme (iCASP) which is funded until 2026. The aim is to use research to make a difference to the environment, economy and society and to promote Yorkshire as a global leader in implementing resilient catchment management. Bradford Council has been involved in a number of iCASP projects involving modelling of WwNP and takes part in the Community of Practice, a group set up by iCASP to bring together people working on different natural flood management projects across Yorkshire. Bradford regularly attends the iCASP Community of Practice (CoP). The meetings provide a forum for networking, learning and disseminating best practice: they are designed to build regional capacity amongst WwNP practitioners through sharing knowledge and discussing challenges and opportunities. The meetings enable participants to undertake informal continuing professional development (CPD). Many of the meetings take place on sites where WwNP interventions have been installed to allow a tour guided by those who have designed and installed the WwNP measures.

The approaches that have been implemented in these projects are all replicable on other catchments within the district and Bradford Council as LLFA and a landowner will continue to work with partners to realise more WwNP projects across Bradford district.

### **Local Flood Risk Management Strategy**

The Flood and Water Management Act 2010 places a statutory duty on the City of Bradford Metropolitan District Council, as Lead Local Flood Authority for Bradford District, to develop a Local Flood Risk Management Strategy. This Strategy must detail the Risk Management Authorities and the functions that they can exercise within the authority area, assess flood risk, the objectives for managing that risk and the measures undertaken to implement those objectives.

This Strategy is currently being updated and will outline the City of Bradford Metropolitan District Council's approach to managing flood risk from all sources throughout the district and is been developed to align with current legislation and guidance. It builds on work undertaken since the publication of the first Strategy in 2016



and aims to continue the forward momentum to better manage the risks and consequences of flooding from ordinary watercourses, surface water, groundwater, rivers, sewers, reservoirs and canals. Objectives within the Local Flood Risk Management Strategy are applicable to the whole of Bradford District and work is ongoing on both the Aire and Wharfe catchments.

### **Strategic Council Polices relating to water management**

Policy SC6 of the Councils Core Strategy, includes provisions to provide clearer direction to new development in contributing towards linking areas and corridors of Green Infrastructure. The policy also now provides for further strategic information on Green Infrastructure as it provides a common thread that links other important issues in the Core Strategy including: local resilience to climate change (in relation to the provision of flood water storage, sustainable drainage and urban cooling), sustainable transport and housing, leisure and tourism, health and well-being and making space for water.

Within Policy SC6 the River Corridors of the Aire and Wharfe and the South Pennine Moors are identified as strategic Green Infrastructure assets due to the opportunities offered to enhance the living landscape as a resource for people and wildlife and to address future needs for flood alleviation, water management, carbon capture and recreation.

Policy EN7 of the Councils Core Strategy, includes provisions to 'Safeguard areas which have the potential to increase flood storage provision and improve defences within the Rivers Aire and Wharfe corridors' and 'The Council will not permit development in areas within the functional floodplain (Flood Zone 3b) as defined in the most up-to-date SFRA with the exception of water compatible uses and essential infrastructure'.

### **Partnership Working**

The Council are working with the Leeds Flood Alleviation Scheme Phase 2 (Leeds FAS2) project team, in partnership with the Environment Agency, to develop a catchment wide approach to reducing flood risk. This includes Natural Flood Management (NFM) measures on the upper and mid stretches of the River Aire as an integral part of phase 2 of the scheme. The scheme is identifying with landowners, which land is suitable for NFM measures. Also, as part of the scheme, potential areas have been identified and shared with partners and the Leeds FAS2 project team. A substantial land bank is required to deliver the Leeds FAS NFM programme and requires a significant amount of buy in from numerous landowners. The Leeds FAS2 project team are very keen to continue to work with large landowners throughout the River Aire Catchment and have continuously engaged with the Council on the potential to implement NFM measures within the district.

West Yorkshire has launched an innovative programme to make the region more resilient to flooding and climate change. The five Lead Local Flood Authorities (LLFA's), Environment Agency and West Yorkshire Combined Authority are partners, and they have support from local stakeholders including academic partners, community-based groups, Third Sector organisations and Yorkshire Water. The Programme will work at catchment level and across administrative boundaries.

The WY FLIP will focus on innovation, exploring new ways of working including bringing together people who do not normally work together such as representatives from the private sector, community groups, charities and volunteers with a keen interest in flood resilience. Collaboration is key and representatives outside of the flood risk and environment sectors will be involved including the finance and insurance sector, transport, education, technology and health to ensure a holistic approach and other benefits for our communities. Learning from the programme will be shared across organisations to help others deliver similar projects successfully across the region, nationally and internationally.

WY FLIP has been kick-started with 2 years of funding from the Yorkshire Regional Flood and Coastal Committee to develop core activities, establish a governance structure and attract more funding to deploy projects and sustain the Programme into the future.

The Wharfe Flood partnership is comprised of Local Authorities within the River Wharfe catchment: North Yorkshire Council, CBMDC and Leeds City Council, the Environment Agency, Yorkshire Water and the Yorkshire Dales Rivers Trust (YDRT). The role of the partnership is to develop projects with partners in the Wharfe catchment and approve Local Levy spend for projects. The Wharfe Flood Partnership has previously approved Local Levy funding for the Addingham 4 Becks project and has recently approved funding for a Wharfe Soil Aeration project led by YDRT and Stage 1 of the River Wharfe NFM Assessment Proposal. It is proposed that the NFM assessment for the River Wharfe catchment is expanded in three stages over the coming financial years. Further projects being developed include the installation of SUDS, this is following on from the Soak it up project where Yorkshire water have been working with schools to retrofit SUDS in the school's grounds

Bradford Council is also part of the [White Rose Forest](#) Partnership. The White Rose Forest is the community forest for North and West Yorkshire, working in partnership with local authorities, landowners, businesses and communities to increase woodland across the region and improve our natural environment. Through the partnership millions of trees are being planted in urban centres and countryside that will help manage flood risk, mitigate the impact of climate change, create jobs and provide happier and healthier places for us all to live, work in and enjoy. The vision of White Rose Forest is 'to create a genuinely sustainable and well wooded landscape in North and West Yorkshire which will benefit local people, the economy and wildlife'.

Bradford Council are an active member of The Yorkshire Regional Flood and Coastal Committee Environment Sub-group champions and acts as an advocate for environmental outcomes and natural contributions to FCERM in Yorkshire. The group covers a range of topics such as, use of Local Levy funding for a strategic approach for Natural Flood Management across the YRFCC area, river basin planning and biodiversity schemes through to beaver reintroduction.

### **Property Level Flood Resilience**

Property Flood Resilience, also widely known as Property Level Protection (PLP), provides property owners and professional partners with practical and cost-effective steps to help lower flood risk, through the use of affordable bespoke products.

These offer an innovative and effective response which 'plugs the gap' that previously existed between engineered flood protection schemes, and either sandbags or the 'do nothing' option. The approach aims to identify products and measures that are appropriate for the person, flood and property together, helping to reduce flood damage and increase peace of mind.

The Council are a board member of the West Yorkshire Flood Innovation Programme (WYFLIP), maintaining oversight of the programme throughout its lifecycle and to facilitate executive decision made at a strategic level to ensure that the activities of the programme align with the core themes and principles. This collaborative work with other West Yorkshire Authorities, Environment Agency and Leeds University through the [Yorkshire Integrated Catchment Solutions Programme \(iCASP\)](#) programme has provided the basis to develop region wide innovative flood resilience initiatives. Bradford Council lead on the theme of Property Level Protection and are currently project managing the WYFLIP Property Flood Resilience project that will pilot new techniques to improve the long-term effectiveness of Property Flood Resilience solutions. Given that there are known gaps where current Property Flood Resilience approaches do not offer long-term success, the project has the potential to significantly improve the future use of Property Flood Resilience across West Yorkshire. The project involves undertaking 250 property level resilience surveys – 50 surveys per local authority area – to be carried out across the region with communities to identify what more can be done to help both residential and business properties become more resilient to flooding. The results and data from the surveys will be used to populate and test the prototype Property Flood Resilience Assured tool and builds on the work undertaken within the DEFRA funded Yorkshire Flood Resilience Pathfinder project enhancing the understanding and uptake of Property Flood Resilience across West Yorkshire. Learning from the project will be shared across organisations to help others deliver similar projects across the region.

### **Sustainable Drainage Systems (SuDS) in Bradford**

A key component of climate change mitigation for Bradford will be flood resilience, and much the schemes that are promoted and developed need to explore innovative solutions for Sustainable Drainage Systems (SuDS) and Nature Based Solutions (NBS). Retrofitting sustainable drainage systems into our urban landscapes is now seen as a priority and is the strategy used on redevelopment projects in the district.

Retrofitting sustainable drainage systems into our urban landscapes is now seen as a priority and is the strategy used on redevelopment projects in the Bradford Beck catchment.

By reducing surface water runoff into local sewerage networks, schemes will help reduce the discharge from Yorkshire Waters Combined Sewer Overflows that connect to the Beck improving the water quality of natural environment. Preliminary discussions have begun between the Council and Yorkshire Water at identifying areas where the implementation of nature-based drainage solutions will reduce flood risk, improve urban water body quality and reduce combined sewer overflow discharges.

Bradford Council has delivered highway improvements and sustainable landscaping works to an area of the City Village locally known as the 'Top of Town', focused on North Parade, Rawson Square and Northgate. A network of 'rain gardens' have been

established as part of a drainage system designed to help mitigate local flooding risks for the project. Rain gardens are areas of planting designed to temporarily hold, filter and soak away any rain water that runs off buildings and paved areas in a more sustainable manner rather than straight into sewers not preventing overloading the sewers. Whilst planting semi-mature trees will contribute to the physical landscape, it will also create new habitats and increase biodiversity. Providing wildlife corridors and connections between green spaces. Providing options for wildlife to travel is extremely important to urban biodiversity. Similar SUDs features and principles are being delivered for One City Park and Transforming City Fund projects.

The Council continues to work on the LIFE Critical European project at Horton Park. LIFE Critical is an EU project that adapts older city neighbourhoods so they are equipped for the effects of climate change. Westbrook Beck, which flows through the ponds and water features of Horton Park, stopped flowing a few years ago. With support from the University of Bradford, the projects objectives are to mitigate the effects of climate change by carrying out work to neighbourhood parks. The thing that makes this different to some other programmes is that the emphasis is on citizen science and recruiting the community to help deliver change with a strong emphasis on improving local drainage, air pollution, loss of ecological diversity and the heat island effect. The innovative approach addresses the problems that these neighbourhoods face with regard to adaptation by exploiting the potential of nearby parks for climate adaptation. Crucial for this approach is the proactive involvement of citizens and co-ownership, because without their support the changes to the parks are difficult to realize. The Council will work with FOBB to find solutions to this issue during the development of the project. Sustainable Drainage Systems (SuDS) will also be installed in the park. These are a more natural way to reduce the likelihood of flooding by transporting surface water elsewhere, slowing the flow of water or using materials to encourage the water to soak into the ground or evaporate.

### **Water Quality Improvements**

Although not falling under the same regulations in terms of flood risk management there can be considerable overlap between water quality and flood risk. Members of Bradford Council earlier in the year approved a motion “Respecting Our Rivers”,:

By reducing surface water runoff into local sewerage networks, schemes will help reduce the discharge from Yorkshire Waters Combined Sewer Overflows that connect to the river networks within the district, improving the water quality of natural environment. Preliminary discussions have begun between the Council and Yorkshire Water at identifying areas where the implementation of nature based drainage solutions will reduce flood risk, improve urban water body quality and reduce combined sewer overflow discharges.

Yorkshire Water Services, working with contractors Ward and Burke, have been on site in Ilkley completing works to create a new transfer sewer. These works started to reduce discharges from Rivadale View CSO, which discharges into the designated bathing area, as well as reduce risk of pollution from a manhole on the public footpath which has historically lifted and had issues with sewage escapes. The new sewer is being installed using a tunnel boring machine to minimise disruption to the community. Key statistics:

- 3404 Cubic meters storage in the tunnel
- 835 meters in length (running from Wharfe Street car park to Ashlands playing field)

before turning down to Ilkley Sewage Treatment Works)

- 1.98M diameter
- Reduce number of spills in an average year by circa 40%
- Reduce volume of spills in an average year by circa 50% This first phase of the works should be complete and operational early within 2024.

### **Land Drainage Investigations**

Bradford Councils Land Drainage Team regularly investigate reports of blocked or collapsed watercourses within the Bradford Beck Catchment. Blockages can lead to an increased risk of flooding, risk of environmental pollution incidents and impacts on the amenity quality of an area.

Land drainage law is complex and is covered within the Land Drainage Act 1991. The Council is able to offer advice about problems associated with land drainage, including ditches, streams, rivers and other watercourses. Essentially, a landowner is responsible for the drainage of their land. If a watercourse passes through land, under the Land Drainage Act 1991, the landowner is classified as a 'Riparian Owner' and is responsible for maintaining the flow within the watercourse and to ensure an impediment to that flow does not exist.

The Council only has a responsibility for watercourse when the Council is the landowner. Other than that, the Council do have powers to act in certain circumstances, to mitigate against the effects of flooding generated from land drainage matters.

If a landowner fails to carry out necessary maintenance on a watercourse, the Council can serve notice and carry out works if ditches have become blocked resulting in a flood risk or health hazard. These powers are contained in the Land Drainage Acts 1991 and Sections of the Public Health Act 1936, but are not instantaneous - the process between first notification of a problem and serving a notice can take years, and further stages are required if the landowner defaults on the notice.

Occasionally investigations reveal blockages on land that is unregistered or where emergency works are necessary. In these instances, the Council conduct a review to understand the risk posed by any defects and if quick interventions will reduce the risk and avoid on-going issues that can take up large amounts of resource.

### **Data and Technology**

The collection, review and reuse of data is becoming increasingly important and a necessary tool to analysing water management, responding to flood events and providing evidence to prioritise resources and initiatives. The Council has worked within a wide range of projects that support better water managements through the use of data and technology

Flow monitoring (funded through the EU Smart Cities and Open Data Reuse project (SCORE)) was put in place to establish baseline flow rates on Backstone Beck and this monitoring has remained beyond the completion of physical works to determine the efficacy of the natural flood management project. This has been published as open data and has been used to inform studies by iCASP and Yorkshire Water. Fixed point

photography posts are also in place on the moorland allowing visitors to submit photos of the landscape in order to monitor changes. The images captured enable us to see the change in the landscape where interventions are in place. Dales Land Net have a series of soil moisture content monitors installed in the upper catchment and Moors For The Future have installed three cameras and three water pressure loggers behind dams in each of the three main tributary channels to Backstone Beck to determine how the dams respond to high water flows – pairing time-lapse with pressure files. In addition, dipwells were installed near the Dales Land Net equipment plus cameras with views of Ilkley. These will remain in place until the end of this year. The flow monitors will be in place for a further 18 months to enable us to undertake post-intervention assessment.

The Council have commissioned a specialist consultant to create a new build computer model of Bradford Beck and its tributaries. The completed model will be ready early next year and will provide computer generated flood outlines and depths in the Bradford Beck Catchment. The model will be used as the evidence base for the emerging Level 1 and Level 2 Strategic Flood Risk Assessment updates for this catchment and the Council will also use the new model for evaluating flood risk management options in future capital works schemes. As part of the project the Council will be undertaking a full structural and geometric survey of the culverted sections Bradford Beck. This will be achieved by using remote laser scanning technology that will provide a full three-dimensional computer model of the culvert structure allowing this data to be used for a multitude of projects. This 3D model can be incorporated into the Virtual Bradford 3D city model helping visualise flood risk scenarios and engage with elected members and the public.

iCASP have undertaken a project to assess the effectiveness of the recently implemented NFM measures on Ilkley Moor. An open-source rain-on-grid catchment and river model has been built that takes into account rainfall and river flow monitoring data collected over the last three years. The work has built on previous iCASP NFM projects such as Hardcastle Crags in Calderdale, but with the advantage of access to a significant quantity of monitoring data at the site. Backstone Beck has provided an ideal NFM test case for integrating multiple stakeholder issues in one model and draws together separate pieces of iCASP NFM project work and staff experience in one project.

There are many flood risk management authorities, asset owners and local authorities invested in the outcomes of the modelling, but none have responsibility for the whole catchment. The aim is to provide partners with a better holistic understanding of how changes will impact on the surface water in the catchment. Partners will be encouraged to co-develop and co-fund a mutually beneficial open model that transcends individual interests. It will help assess what proposed changes to drainage arrangements within the catchment might mean for the Beck, for example, helping to explore a potential diversion of Ilkley Tarn outflows from the combined sewer. Work such as this is valuable to wider water management issues such as water quality and the Wharfe at Cromwheel Bathing Water Designation. Bradford Council are working with Yorkshire Water and the Environment Agency to better understand all pressures on the river at the Bathing Water designation point and other LLFA's for the wider Wharfe catchment.

The Council offers an electronic stay connected email bulletin service to residents. The Stay connected is one of the Council's corporate communication channels. One service that can be signed up to is the delivery of up to date weather warning and flooding alerts and information about preparing for flooding before, during and after an event.

This service can be signed up to at the following link,

[Stay Connected - sign up for email alerts | Bradford Council](#)

To ensure the districts residents can prepare themselves for flood events and to improve their resilience, the Council offer advice on their website about property flood resilience measures and plans. This advice can be viewed at the following link

[Flooding information and support | Bradford Council](#)

### **Maintenance funding for water management assets**

The Land Drainage & Flood Risk Management service do not receive capital funding to undertake maintenance works on Council owned drainage infrastructure. The responsibility of drainage infrastructure will depend on which department or service manages the function of each individual asset. The Land Drainage & Flood Risk Management service work with the Environment Agency, Yorkshire Water and other organisations to identify and progress flood risk schemes within their capital works programme to address property flooding and is actively looking for match funding to reduce the pressure on existing drainage systems.

The Highways Service manages a range of existing drainage infrastructure including assets such as the carrier drains that serve the highways, road gullies, roadside ditches, drainage outfalls, and culverted watercourses that pass under the highway. Budgets used to maintain these assets are limited and base revenue budgets have decreased over recent years due to the spending constraints the Council is facing. However, under the initial 5-year City Region Sustainable Transport Settlement (CRSTS), implemented in 2022/23, capital funding for 'Asset Management and Enhancements' includes an allocation for 'Drainage', which is allowing the Council to implement further repair and improvement works across the district.

The Council maintain 25 trash screens that protect downstream culvert systems from becoming blocked. The Trash Screens therefore provide protection to many key highway networks works plus approximately 250 residential properties. The maintenance works to keep the trash screens cleared are currently funded through Council staff revenue budgets.

As the Council promotes and delivers more flood risk management projects through its Capital Flood Risk Management Programme to meet the needs of a changing climate, there will be additional funding stresses in maintaining these assets. The Government do not provide revenue funding to local authorities for the maintenance of flood risk management schemes. All authorities will be facing this increasing challenge after the impact of years of austerity and budgetary pressures meaning more innovative ways to manage assets will need to be explored.

## **4. FINANCIAL & RESOURCE APPRAISAL**

The measures being undertaken by the Council and its partners through these funding streams are being delivered through a range of specific capital grants and revenue

budgets. Over the last year the service delivered a programme of works of circa £1.2m across its portfolio of programmes.

With the progression of the flood risk capital programmes the service has had to procure additional support for delivery of its programmes to supplement its own internal resources. As the intensity of delivery for these programmes ramps up over the next couple of years this is likely to be a maintaining trend.

The Government do not provide revenue funding to local authorities for the maintenance of flood risk management schemes. All authorities will be facing this increasing challenge after the impact of years of austerity and budgetary pressures meaning more innovative ways to manage assets will need to be explored.

## **5. RISK MANAGEMENT AND GOVERNANCE ISSUES**

The programmes of schemes and proposals described in this report are subject to robust risk management and governance arrangements to ensure their delivery is effectively managed at both Environment Agency and Council levels. Individual programme boards, comprising representatives of the Council and their EA counterparts meet on a monthly basis to review progress of individual schemes. A rigorous risk management process is applied to these projects and programmes with comprehensive risk registers being developed and maintained at both project and programme levels.

## **6. LEGAL APPRAISAL**

There are no legal implications directly arising from this report.

## **7. OTHER IMPLICATIONS**

### **7.1 SUSTAINABILITY IMPLICATIONS**

The requirements of these policies have been adopted as far as possible across all schemes which are at an advance stage of delivery (Outline Business Case or later) within the delivery programmes and are fully adopted in schemes which are in the early stages of development.

### **7.2 TACKLING THE CLIMATE EMERGENCY IMPLICATIONS**

In the context of the Climate Emergency declared by the Council in January 2019, reducing greenhouse gas emissions is a priority for the district. The projects described in the programme of works in this report are required to report and value their carbon impact.

The Environment Agency uses a net carbon benefit approach to capture the carbon costs, carbon emissions avoided and any carbon sequestration of flood risk management schemes. This uses the [Green Book](#) approach to carbon costing combined with specific research on the carbon emissions avoided and carbon sequestration that flood risk managements can provide.

Flood risk management schemes provide carbon avoided benefits as their implementation, offsets the carbon spent in emergency and repair works in recovery



after a flood event. This carbon avoided is calculated over the lifetime of the flood risk management intervention.

### **7.3 COMMUNITY SAFETY IMPLICATIONS**

None

### **7.4 HUMAN RIGHTS ACT**

Any Human Rights implications arising from schemes described in this report are taken into account in the development of that scheme.

### **7.5 TRADE UNION**

There are no trade union implications associated with this report.

### **7.6 WARD IMPLICATIONS**

All wards in the district are impacted by flood risk and water management. The wards in which the measures described in this report are implemented will generally benefit from the improvements. Appropriate consultation has, and will continue, to take place with Ward Members and local communities during the development of individual projects.

### **7.7 AREA COMMITTEE ACTION PLAN IMPLICATIONS (for reports to Area Committees only)**

Not applicable

### **7.8 IMPLICATIONS FOR CHILDREN AND YOUNG PEOPLE**

There are no implications arising as a consequence of this report.

### **7.9 ISSUES ARISING FROM PRIVACY IMPACT ASSESSMENT**

Not applicable

## **8. NOT FOR PUBLICATION DOCUMENTS**

None

## **9. OPTIONS**

Members are asked to consider the report and provide views and comments.

## **10. RECOMMENDATIONS**

**That Bradford Council's Regeneration and Environment Overview and Scrutiny Committee to:**

- (i) Consider the contents of this report and provide views and comments.

- (ii) Determine when to receive the next report which provides an update on the Councils progress of all Water Management and Resilience initiatives within the district.

## **11. APPENDICES**

Appendix 1 Flood Risk Management Projects Highlights

Appendix 2 Bradford Councils Capital Flood Risk Management Programme

## **12. BACKGROUND DOCUMENTS**

Water Management Scrutiny Review Report 2017

[Env2MayDocAMAppendixDraft Report - Water Management Scrutiny Review KW.pdf \(modern.gov.co.uk\)](#)

Bradford Councils Strategic Flood Risk Assessment

[Evidence Base | Bradford Council](#)

Bradford Councils Local Flood Risk Management Strategy 2016

[bradford-lfrms-final.pdf](#)

# Appendix 1 Flood Risk Management Projects Highlights

## Bradford Live Culvert Remediation Works

During the course of the Bradford Live refurbishment project, it came to light that there are a number of cast iron beams located within the Bradford Beck culvert, directly under the site. Some of these beams are very badly corroded.

The discovery of the culvert condition did not become apparent until the building refurbishment project was well underway, so any works to the culvert were going to be severely hampered by the construction works on the building, above.



Access to the culvert was a major concern. There was no space above the culvert, because this was in constant use by the Bradford Live Main Contractor. Also, working from above was not practicable, due to the thickness of the ground floor slab and the lack of available space within the Odeon building for plant and machinery. This meant that any solution to remove the corroded beams and replace them from above was not possible and an alternative

solution was needed.

The Council worked closely with specialist contractors to agree a solution to install twin structural GRP liners within the culvert, and grout them in place, to achieve composite action, rendering the existing corroded beams redundant.

In order to fill the void, between the liners and the existing culvert, core holes were drilled through the slab of the Odeon building in the space between the existing beams. The positions of the beams were surveyed using a laser scanner and this allowed them to be accurately marked out on top of the floor slab. The void was infilled with a high strength, structural, grout.

The project was completed to time and within budget and the solution has saved significant costs, compared with the alternative of replacing the steel beams within the Bradford Live site.

Environmentally, the project saved 229T of carbon and helped the Council meet their carbon saving goals.

This project is an excellent example of the benefits of Early Contractor Involvement, and of the benefits of the Client working closely with a Design and Build Contractor.

## Redcar Lane Flood Alleviation Works

Further to the establishment of the Board one project to make it to construction within the Bradford Capital Flood Risk Programme this year was the Redcar Lane Flood Alleviation Scheme. The project was first established using £15k local levy investment from the YRFCC. This allowed the project team to develop a business case for a fully funded Flood Defence Grant in Aid scheme to the value of £100k



Redcar Lane is a small 'B' road that connects Keighley to Eastburn. The road and properties adjacent the road had flooded in recent times during the 2015 and 2020 flood events. The project included the installation of the flood relief system to divert water from the highway and properties to an adjacent infiltration system located in a nearby field. The project was completed in early 2023.

## Ilkley Moor Resilience Project

The Backstone Beck Natural Flood Management (NFM) Project fully completed in April 2022 and whilst CBMDC have continued flow monitoring and worked with iCASP and YW to utilise monitoring data for ongoing modelling work (covered in YW engagement) the drainage and Countryside and Rights of Way teams feel there is a need to secure multiple benefits from the Councils moorland management and enhance the works already achieved on the Backstone Beck catchment by replicating the works over a minimum of two further watercourse catchments.



Peatland Restoration on Ilkley Moor

A PAG funding bid was successful in securing £200k of Climate Emergency Funding for Peatland Restoration works. The works will improve peat quality and quantity over time thus improving carbon sequestration through blanket bog creation. Improvements in moorland habitat and biodiversity, increased surface water retention and reduced surface water run-off, erosion and sediment loss are also benefits of such a project. A

feasibility study is currently being undertaken by Moors for The Future (MFTF) who are the regional delivery partnership for peatland restoration works in the South Pennine Moors SAC which encompasses moorland within Bradford District. They have the necessary specialist expertise and resources to undertake peatland restoration and are familiar with the NFM interventions having worked on Backstone Beck. The feasibility study has been match funded by Rebel Restoration; they are the charitable arm of the company Rebel Energy and they are supporting the Ilkley Moor Resilience project as their Peatland Restoration Project alongside Seagrass meadow restoration in Wales and England and a rewilding project in Scotland.

This project offers an opportunity for CBMDC to demonstrate a range of NFM interventions to other landowners in the Wharfe catchment which will be valuable to the ongoing work of all LLFAs and partner organisations progressing NFM in this area.