

Flood Risk Management Annual Report

Report of the Assistant Director Highways and Infrastructure - March 2021

1. Introduction

A scrutiny review of Flood Risk Management (FRM) and Response was published in June 2010. This set out 12 recommendations which were completed in 2010. In June 2010, The Flood and Water Management Act 2010 passed into law conveying new responsibilities and making Birmingham City Council a Lead Local Flood Authority (LLFA). This report highlights progress in addressing these statutory responsibilities and provides an update on other flood risk management related issues.

This report also provides an update into areas for improvement identified in the review of the May 2018 flooding conducted by members of the Sustainability & Transport O&S Committee on 19th July 2018. No major issues were raised at the submittal of the last Flood Risk Management Report in April 2020.

1.1 Climate Emergency

On 11th June 2019, Birmingham City Council (BCC) announced a climate emergency and made the commitment to reduce the city's carbon emissions and limit Birmingham's contribution to climate change, with an aspiration to become net zero carbon by 2030. The impact of climate change will not just be felt afar, and the impact on Birmingham residents of increased extreme weather events, including flooding, droughts and heatwave is likely to be profound, with increasing risks to both life and property. Given our global footprint and the diversity of the city, the climate crisis will hit at the heart of families and communities within the city.

The Flood Risk Management team is mindful of the changes and impacts upon infrastructure, people and places and works with our local contractors and PFI partner to pre-emptively clear and monitor high risk structures and assets which have a significant effect on flood risk.

We are working with communities, our Private Finance Initiative (PFI) partner and our Flood Action Groups to provide sandbags, provide cyclical maintenance to high risk structures and additional clearing of gullies and trash screens in advance of a storm or flood event to proactively decrease the impact of surface water flooding across our area. Some areas are more challenging than others and require community buy-in and co-operation to access busy roads and gullies on residential streets.

The Flood Risk Management team also monitor weather alerts and are pro-active in terms of responding to weather alerts and have an out of hours rota for added contingency during evenings and weekends. Names and numbers of the appropriate staff are shared with the Control Room and this worked with good effect for the June 2020 thunderstorms and heavy rainfall events. The team, when health and safety / resources allow, also actively monitor flood levels on-site and work alongside other organisations in flood events to ensure a multi-agency led approach and co-operation with partner organisations such as the emergency services, the Environment Agency and Severn Trent Water.

1.2 Clean Air Zone

Birmingham City Council is required to take action to meet legal air quality limits and aims is to implement the Clean Air Zone in 2021, in order to deliver the health benefits as quickly as

possible. In big cities such as Birmingham, road transport is the biggest source of air pollution. Constant monitoring shows that the impact of pollution on air quality is biggest next to busy main roads. Levels of air pollution can vary over short distances, including from one side of a pavement to the other. Figures show that up to 900 deaths a year in Birmingham alone can be attributed to man-made pollution, mostly through transport and the increased use of diesel vehicles. By contrast, there are fewer than 30 deaths resulting from collisions on Birmingham's roads each year. Pollution results not only from the exhaust of cars and vehicles but also from mechanical wear and tear of engine components, friction from tyres on the road and wear of brake discs and pads – all of which lead to tiny particles known as particulate matter getting into the air we breathe.

1.3 COVID-19 Contingency

In light of the current COVID-19 pandemic and future COVID recovery stage, the Flood Risk Management Team have increased team resilience by being able to work in an agile fashion, work remotely and have a contingency plan in place for remote working, covering essential work and communication channels. Additional emergency IT needs have been identified and ordered to ensure that all members of the team are able to fulfil their roles in case of flood events during the ongoing pandemic. There is added contingency in case of a flood event during the pandemic, and the team are able to double-staff the out of hours rota to provide essential cover. The Resilience Team are working with wider teams to ensure that the Council is prepared and have contingency for vulnerable and 'at risk' people during this period.

A Flood Risk representative has been involved in the Environment Cell and the COVID Recovery Group (CRG) to help inform COVID related environmental issues and to take part in the Environment Cell decision-making process. This involvement has meant close collaboration with other teams from Inclusive Growth, Neighbourhoods and our PFI partner - Kier and this close working resulted in a good response to the June 2020 flood events. The Environment Cell structure allowed for out-of-hours communication and requests to other teams such as Neighbourhood Street Cleansing and Waste Management for help and assistance, post flood event.

2. Flood and Water Management Act Duties

The following work has been undertaken to fulfil the Lead Local Flood Authority duties under the Flood and Water Management Act.

2.1 Local Flood Risk Management Strategy

The Local Flood Risk Management Strategy, October 2017, which states the strategic direction for the management of flood risk across Birmingham is being updated for 2021, to reflect recent flood events, future pipeline of schemes and states our intent to work with partners to address, manage and mitigate against flood risk. The Local Flood Risk Management Strategy update was postponed due to the publication of the Environment Agency's National Strategy which was published in September 2020.

The Environment Agency strategy has a long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It has 3 long-term ambitions, underpinned by evidence about future risk and investment needs. They are:

- **Climate resilient places:** working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change
- **Today's growth and infrastructure resilient in tomorrow's climate:** making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as infrastructure resilient to flooding and coastal change

- **A nation ready to respond and adapt to flooding and coastal change:** ensuring local people understand their risk to flooding and coastal change, and know their responsibilities and how to take action.

By strengthening collaborative working arrangements to improve flood risk management, Birmingham City Council as Lead Local Flood Authority can deliver more schemes / drainage improvements and share best available data and good practice, supported by partners and other risk management authorities.

2.2 Cooperation with other Flood Risk Management Authorities

The Lead Local Flood Authority continues to cooperate extensively with other risk management authorities (RMAs) at various levels as established in the 3 tiered flood risk management governance structure.

2.2.1 Strategic Flood Risk Management Board

The Strategic Board last met in December 2020 and was well attended by members of the Flood Risk Management Team, Assistant Director of Highways, Severn Trent Water, the Environment Agency and Honorary Alderman Tony Kennedy. The Strategic Board meets yearly and is scheduled to meet again in December 2021. The Strategic Board acts as the focus and political driver for partnership activity and allows for updates and progress from partners. No major issues were escalated to the Strategic Board from either the Birmingham Water Group or other risk management authorities.

2.2.2 Birmingham Water Group

The Birmingham Water Group met twice in August and September 2020, due to the numbers of future schemes and areas affected by the 2016, 2018 and 2020 flood events. The Birmingham Water Group is the officer led partnership working to deliver flood risk management improvements across the City, and has representation from the Flood Risk Management Team, Severn Trent Water, Kier and the Environment Agency.

2.2.3 Project Groups

The Lead Local Flood Authority has worked with partners on a number of projects as follows:

River Rea Partnership

The Rea Catchment Partnership, led by the Environment Agency has recently completed construction of two flood risk management schemes in the City:

- **Selly Park North Flood Risk Management Scheme**

The Selly Park North flood risk management scheme is now fully operational with only landscaping to be finalised once adjacent developments have been completed. The Environment Agency has worked in partnership with Calthorpe Estates, Birmingham City Council and other organisations have developed the Selly Park Flood Risk Management Scheme to help reduce the risk of flooding.

The area of Selly Park North has a history of flooding from the Bourn Brook severely affecting the area in 2008 and more recently in June 2016. The scheme reduces flood risk to 150 properties in the area. The scheme involved deepening and widening an existing flood water storage area near the Bourn Brook Walkway on Harborne Lane, Harborne. This increased the capacity of the storage area and offered wildlife and ecology improvements. Flow improvement works were also carried out at the Pebble Mill development site creating an overland flow route to direct flows into a new bypass culvert running underneath the Pershore Road. This has reduced the risk of fluvial flood water getting onto the highway and into

properties. The Environment Agency, Severn Trent Water and Birmingham City Council are continuing to look at the residual risk of surface water flooding.

Construction of the scheme completed in July 2019 with landscaping scheduled for completion once adjacent development has completed.

- **Selly Park South Flood Risk Management Scheme**

Construction has completed on the Environment Agency's £2.4 million flood risk management scheme in Selly Park South, with landscaping to be completed. The Environment Agency has worked in partnership with St Andrew's Healthcare, Birmingham City Council and other organisations to develop the Selly Park Flood Risk Management Scheme to help reduce the risk of flooding.

The area of Selly Park South has a history of flooding from the River Rea, most notably in 2008 when some residents were forced to move out of their homes as a result of flood damage. This scheme will help protect more than 200 properties in the area from fluvial flooding. The Environment Agency, Severn Trent Water and Birmingham City Council are looking at the residual risk of surface water flooding.

The scheme included the construction of an embankment on public open space, immediately upstream of Dogpool Lane bridge to help hold water during extreme heavy rainfall events. Bank levels were also raised downstream of the bridge to reduce the risk of flood water getting into properties.

The **River Rea Partnership** is currently undertaking the following strategic study:

- **Upper Bourn Brook Study**

The Environment Agency, Severn Trent Water and Birmingham City Council are working together on a catchment-wide study to understand the flood risk and develop flood mitigation options for the upper Bourne Brook catchment. The study covers the catchment upstream of Harborne Lane, Selly Oak, taking in Quinton, Woodgate, Bartley Green and Harborne. The study is at an early stage, initial modelling has been undertaken and high-level options are being investigated. Once this is complete the Environment Agency will prepare a Strategic Business Case on behalf of the partnership with a view to securing funding to further develop the options.

- **Lower Rea and The Bourn**

The Environment Agency is working on a catchment wide study to understand the flood risk and develop flood mitigation options for the Bourn and Lower Rea catchment. The Flood Risk Management Scheme, is currently at Strategic Outline Case development stage (funded by Government Grant in Aid) to find a preferred way forward and viable scheme. This is likely to involve a series of flood storage areas on The Bourn and also potentially on the Lower Rea in Birmingham. The area has suffered extensive flooding in 2008, 2012 and 2016. We are currently working with partners, including Birmingham City Council, West Midlands Combined Authority, Severn Trent Water and private businesses and developers to explore opportunities for delivery and funding contributions. This will help the project progress to Outline Business Case to develop the preferred option further and assuming funding can be found then on to Full Business Case and Construction.

The River Tame Flood Risk Management Strategy

The River Tame Flood Risk Management Strategy sets out the Environment Agency's strategic approach to flood risk management on the River Tame by considering opportunities to manage flood risk across a wide area, while providing environmental benefits. The Environment Agency is currently delivering two schemes under this strategy.

- **Perry Barr and Witton Flood Risk Management Scheme**

A key part of the River Tame Strategy is the implementation of the Perry Barr and Witton flood risk management scheme which is to be delivered over 2 phases. There are approximately 1,400 properties at risk from this section of the River Tame, including 950 residential properties. Phase 1 of the scheme was completed in spring 2017, bringing new flood walls, flood gates and flow conveyance improvements from Brookvale Road in Witton down to Gravelly Park Industrial Estate in Aston. Improvement works to culverts under the railway line in this area are currently outstanding, but will be completed as part of Phase 2. The improved flood wall and flood gates in Witton successfully stopped properties from flooding in May 2018. Construction work for Phase 2 started in late January 2018. The work here will increase flood storage capacity in the Sandwell Valley and is expected to be completed by the end of 2021. Birmingham City Council has made a contribution of £600k to this scheme in early 2019.

The Environment Agency will continue with their programme of environmental works. This will improve the quality of existing habitats, including grasslands, hedgerows and woodland. They also plan to plant over 20,000 trees as part of the scheme and have recently commenced with the winter tree planting programme. This work has started just south of the compound on the land between forge lane and the cycle path. This scheme will reduce future flood risk along the River Tame by the construction of a 1.7 million cubic metre flood storage reservoir in the Sandwell Valley.



Aerial photo of the Perry Barr and Witton Flood Scheme construction site in the snow, taken January 2021. Photo courtesy of Andy Purcell.

- **Bromford and Castle Vale flood risk management scheme**

The final scheme identified as part of the River Tame Flood Risk Management Strategy is the Bromford and Castle Vale flood risk management scheme which will better protect more than 900 homes and businesses from flood risk. The scheme involves raising flood walls and constructing new ones as well as building earth embankments. A cycling route will

be provided along the south bank linking up with the existing networks at Bromford Road and Chester Road. Construction work started in January 2020 with works expected to take approximately 18-24 months to complete.

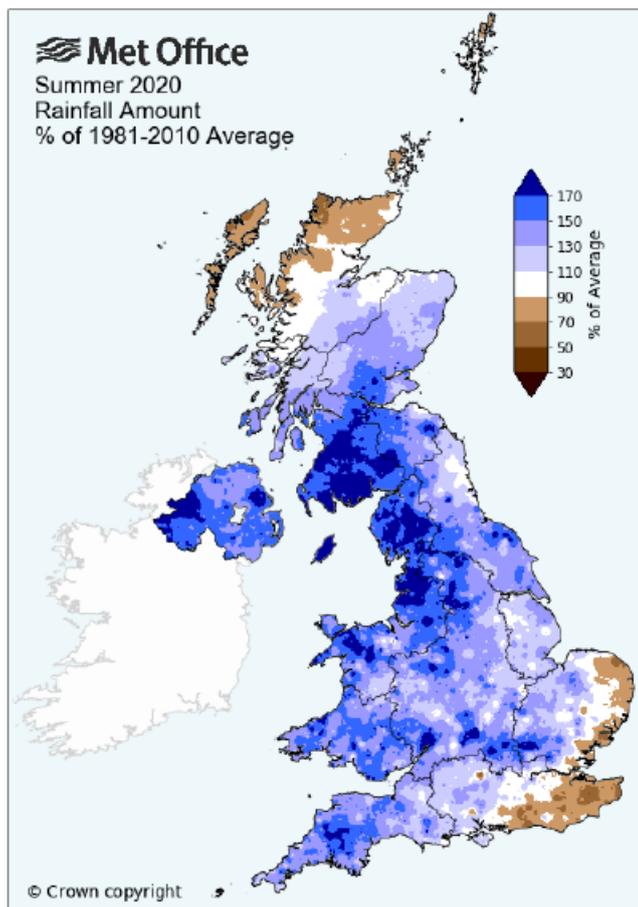
2.3 Investigation and Publication of Reports of Flooding Incidents

2.3.1 Significant Flood Events

The Met Office notes that 2020 was warmer than average for the UK, and ranks it as the third warmest year in a series from 1884. 2006 and 2014 were warmer years, and 2011 was almost as warm. It was also the sixth wettest year in a series from 1862, and the eighth sunniest since 1919, so is remarkable for being ranked in the top ten for all three variables. All the top-ten warmest years in the historical series have occurred this century.

Notable extreme events during the year included several heavy-rainfall events in February, and numerous incidences of flooding across England and Wales in the autumn / winter of 2020. Ten named storms affected the UK during 2020. Towards the end of the year flooding was exacerbated as further rainfall fell on already saturated ground. Also noteworthy were several short hot spells, including the Easter bank holiday weekend as well as during the summer.

April 2020 was a dry month with dominating high pressure. Decent rain totals were recorded around the middle of the month, only 39% of the LTA (long term average) rainfall was recorded in April for the River Trent Basin. May 2020 was an extremely dry month with high pressure bringing very warm and settled conditions and nationally, it was the driest May since 1862. Only 12% of the LTA rainfall was recorded for May in the Trent Basin.



Early June 2020 had spells of high pressure and dry weather, however, around the 16th-19th June; Birmingham had unsettled conditions, with warm and humid weather bringing thunderstorms. The remainder of the month was also changeable with drier weather mixed with heavy thunderstorms.

153% of the LTA rainfall was recorded in the Trent Basin in June. A slack area of low pressure brought warmer weather with frequent showers and thunderstorms for much of this period, and from the 16th – 19th June, showers developed in central and western areas, turning thundery across the Midlands and the north-west. On the 16th, 17th and 18th, flooding affected many parts of Wales, the south-west, Liverpool, Manchester, West Midlands, Cambridgeshire, west Norfolk, Kent, coastal Ayrshire and Northern Ireland, leading to blocked roads and transport disruption. Warm fronts brought a dull wet day on the 18th,

with showers and longer spell of rain spreading northwards to most areas on the 19th, being thundery in places.

During the June Flood Event

Flood alerts (based on forecast) were issued by the Environment Agency on the 16th June for the whole of Birmingham and surrounding areas – including the River Cole, River Rea and Upper Tame. Birmingham City Council and Kier received a high number of calls during the June thunderstorms, which reported widespread flooding of gardens and highways, with significant flooding noted on the Stratford Road, Golden Hillock Road and Percy Road, with flooding experienced in Sparkhill, Acocks Green, Hall Green, Digbeth and South Yardley, amongst other lesser affected areas. During the thunderstorms, the Lead Local Flood Authority coordinated with multiple Risk Management Authorities (RMAs) such as the Environment Agency, Staffordshire County Council, the Black County Authorities, BCC Highways and PFI partner and worked closely with the BCC Street Cleansing to ensure that the impact of flooding was managed effectively and the risk to people and properties was mitigated as far as reasonably practicable.

Although Birmingham was not as adversely affected as other areas across Staffordshire and the Black Country, the Lead Local Flood Authority and Highways PFI partner arranged pre-emptive maintenance on high risk structures and sandbag / hydrosnake provision to Flood Action Groups. Liaison with affected Flood Groups ensured that our Flood Action Groups were prepared and site visits were undertaken to monitor river levels to inform whether sandbags should be deployed to pre-arranged areas.

Flood Event s19 Investigations

In 2016 and 2018, a significant number of flooding incidents were reported to Birmingham City Council. Immediately following the events, Birmingham City Council distributed approximately 2,000 'Flood Surveys' to all residents within, or in close proximity to, all areas where flooding was reported.

Flood surveys are important as they provide accounts of duration and depth of flooding along with any other pertinent information. These responses can accurately report internal property flooding, flooding to gardens and flooding to highways and surrounding areas.

Although the June 2020 thunderstorms did not trigger a formal s19 investigation, mainly due to the sheer amount of intense national rainfall that overwhelmed sewers and smaller watercourses – a Stage 1 investigation was undertaken for each reported incident to ascertain the source, path and receptors affected by the flooding. Flood Questionnaires were sent out and COVID-secure site visits were undertaken in order to gather information and to inform any future mitigation. These locations have now been added to the six year pipeline of schemes such as the 'Highway Drainage & Sewer Renewal Programme' - a renewal and upgrade scheme in conjunction with BCC Highways and Severn Trent Water; a 'City-Wide Culvert Renewal Programme' to reline or upgrade culverts in a poor state or condition; and a 'City-Wide PFR (Property Flood Resilience) Programme' to capture properties where an engineered solution is unviable or not cost-effective, in line with the Environment Agency's partnership funding arrangements.

Groundwater

Birmingham is located over a principal aquifer. The Birmingham Strategic Flood Risk Assessment indicates that it is expected that groundwater levels will continue to rise towards its natural level as industrial abstractions continue to cease; and this is believed to be the cause of groundwater flooding within the council boundaries. Groundwater levels depend on aquifer properties, local geological conditions and a complex balance between recharge from rainfall, and discharges to rivers or pumped abstraction. Groundwater levels can change seasonally and rebound to the surface after a period of prolonged rainfall. Groundwater levels in Birmingham and London have been rising due to the cessation of pumping from wells, and abstractions not being as frequent as they once were at the start of the 20th century. Autumn-Winter 2020 was generally unsettled

across the Trent Catchment and persistent rainfall and snowfall also meant that groundwater has become an re-emerging issue across areas of Birmingham.

Detailed Investigation and Analysis

The Lead Local Flood Authority conducts detailed investigation and individual location analysis of each area where a property experienced internal flooding. These investigations typically include a review of existing infrastructure and topography, identification of predominant flow paths, site visits and local knowledge gathering. Through a detailed analysis, the Lead Local Flood Authority has identified the types of flooding that occurred at each location during the events of both June 2016 and May 2018.

The Flooded Sites Action Tracker has been updated following the flooding incidents in June 2020, with any feasible cost-effective options to be brought forward into the new pipeline of schemes. The team have also been collating flood questionnaires and advising other risk management authorities on mitigation, whilst ensuring high risk structures are kept clear from blockage.

Recommended Actions

Following analysis of affected areas, the Lead Local Flood Authority works in collaboration with other Risk Management Authorities to identify opportunities and options to mitigate flood risk, as the potential that a similar rainfall event will result in similar outcomes.

2.3.2 Section 19 Flooding Investigation Report

The Flood and Water Management Act places a duty on Lead Local Flood Authorities to investigate incidents of flooding and this is set out in Section 19 of the act and the investigations are therefore typically termed '*Section 19 Reports*.' The final May 2018 report was published on 30th August 2019 following sign off by the Strategic Flood Risk Management Board as per the previous Section 19 report into the May 2016 flooding.

Birmingham City Council and other Risk Management Authorities continue to progress the actions identified in the May 2016 and 2018 Section 19 Reports.

2.3.3 Flooded Sites Action Tracker

Flood events are tracked in a Flooded Sites Action Tracker. A copy of the most recent tracker is attached in Appendix A. As a result of the May 2018 flooding the number of locations on the tracker has increased substantially. However, plans are in place for the majority of locations, but solutions range from works in the current year, through to proposals for longer term national and regional grant funding.

2.4 Register of Flood Risk Management Assets

Birmingham City Council continues to maintain a register of structures or features which, in the opinion of the authority, are likely to have a significant effect on a flood risk in its area. This register can be viewed online.

A number of assets have been inspected over the last year in line with the inspection frequency set out in the asset register. Where an issue with an asset has been identified the asset owner has been notified and asked to undertake the necessary maintenance works.

The team has also developed our own Hydraulic Maintenance of Structures (HMOS) database to identify the maintenance priority of structures from potential blockages and the resultant extent of flooding if no cyclical maintenance is undertaken in high risk areas. This database is to be used as the main driver to develop and promote a FRM Capital Programme of works.

2.5 Consenting Works on Ordinary Watercourses

Birmingham City Council as Lead Local Flood Authority is the Authority responsible for regulating activities on ordinary watercourses in Birmingham. As a result Birmingham City Council is legally responsible for dealing with applications for ordinary watercourse land drainage consents. In 2020, twelve applications were received, plus advising on internal works and HS2 crossings / exempt activities.

2.6 Works to Manage Flood Risk

The Lead Local Flood Authority has delivered a number of capital and revenue schemes. These works are funded from a variety of funding mechanisms and a considerable number of flood risk management works have been delivered internally on behalf of other Birmingham City Council service areas. Most notably the Flood Risk Management Team works routinely with our Leisure services team to provide consultancy services for drainage and environmental improvement works as well as arranging statutory inspections under the Reservoir Act 1975 in order that the Council's large raised reservoirs are managed in accordance with the Act.

The Environment Agency pipeline is a rolling 6-year programme which is updated annually. This 6-year programme allows for the development of schemes which will be delivered in future years. The delivery of the £580k Flood Defence Grant in Aid and Local Levy programme for 2020/21 which includes flood alleviation for up to fifty properties in 2020/21 with construction phase until 2022. BCC-led projects and works including flood mitigation and drainage improvements for other teams and directorates will take place outside of this external programme, as detailed below:

The following works have been progressed since January 2020.

2.6.1 Grant Funded: Flood Defence Grant in Aid and/or Local Levy

Property flood resilience measures: (e.g. fitting of flood doors to properties) and local investigation / measures

- **Pitcairn Close** - complete.
- **Pretoria Road** - complete.
- **Handsworth Wood Modelling** - complete. PFR likely.
- **Henlow Road Modelling** - complete
- **Moor Green Modelling** – complete

Grant Funded: External Organisations (Partnership working)

- **River Cole works Formans Road to Station Road** – Re-profiling existing channel by widening/meandering, installation of flow deflectors, bank stabilisation for Environmental, habitat and Flood improvements (The Wildlife Trusts Birmingham & Black country)
- **Woodgate Valley Bourn Brook** – Naturalisation works, Abandonment of Major Weir structures and gravel augmentation/introduction, construction of new Ford crossing – improve morphology, improve channel capacity and flow conveyancing to reduce flooding. (Environment Agency)

2.6.2 Works Funded by Flood Risk Management Revenue Budget

Routine clearance to all strategic grill structures (frequencies vary from weekly to 6-monthly depending on the criticality of the asset) and additional grill clearance following severe weather.

2.6.3 City Wide

Sandbag distribution and re-stocking of Hydro-snakes to Flood Action Groups.

- **Selly Park South**
- **Selly Park North**
- **Northfield**
- **Sparkhill**

Restoring flood channel/culvert capacity by excavation, cutting back vegetation and removing major blockages:

- **Holland Road to Lower Queen Street** - Plants Brook
- **Harborne Road to Lordswood Road** - Chad Brook
- **Acheson Road to Skelcher Road** - unnamed watercourse
- **Sunningdale Close unnamed watercourse** - Tributary to River Tame
- **Peters Avenue** - Tributary to River Rea
- **College Road to Crayford Road** - unnamed watercourse
- **Inspecting strategic culvert structures**

2.6.4 Inspection & maintenance work to flood defence assets:

- **Tysley Brook, Hall Green**
- **Oddingley Road, Turves Green**
- **Park Lane, Castle Vale**
- **Steel Road, Turves Green**
- **Eachlehurst Road, Walmley Ash**
- **Washwood Heath Road, Ward End**
- **Maintaining safe and clear access routes to flood defence assets**

2.6.5 Works provided for other BCC Departments

On behalf of the Local Planning Authority:

- **Sustainable Drainage and permeability / suitability checks** - To inform Sustainable Urban Drainage Strategy (SuDS) suitability for the Strategic Housing Land Availability Assessment (SHLAA) sites on behalf of the Local Planning Authority. The Flood Risk Management team have processed approximately 20 pre-application requests and provide advice on drainage considerations and flood risk.

On behalf of Housing:

- **Fisher Close** – Excavate and removal of silt to restore storage capacity of pool, and erection of safety fencing
- **Merrits Brook** - Channel clearance, removing major blockages and excavation works to restore channel capacity
- **Perry Common Public Open Space** – Cutting and collecting of all Himalayan Balsam vegetation adjacent to brook, ensuring existing flows are not impeded and maintaining cross sectional area of existing channel
- **Westley Brook, Oakhurst Channel** – Removal of urban debris and blockages. Cut and remove large fallen trees in channel to restore channel capacity to prevent localised flooding.

On behalf of **Bereavement:**

- **Brandwood End Cemetery, Brandwood** – Consultation on construction of kerb drainage and a bund within the cemetery to pick up over land flow and alleviate localised flooding.
- **Handsworth Cemetery, Handsworth** – Site investigation works and analysis to localised flooding - resulting in the construction of new pipework, kerbing and path reinstatements to alleviate flooding.

On behalf of **Leisure:**

- **Chestnut Drive, Erdington** - Channel clearance, flood investigation, CCTV Survey
- **Clay Lane, Yardley** – Excavating channel and jetting pipework to prevent overland flows resulting in localised flooding
- **Clifton Road, Sutton Coldfield** – feeder stream blockage removal to help alleviate flooding to Leisure Centre
- **Cannon Hill Park, Edgbaston** – Silt analysis, fish removal, de-watering, and removal of silt to improve water quality and improve the operation of overflow /draw down structure, alleviate flooding to the MAC centre works are on-going.
- **River Cole, Sparkhill** - Formans Rd to Nethercote Gardens river clearance work to remove major blockages to prevent localised flooding
- **Sparkbrook, Sparkhill** , - Removal of blockages, bank stabilisation and restoration of flood channel in Sparkhill Park to prevent localised flooding
- **Westley Brook, Olton** – In Fox Hollies Park, removing blockages, urban debris accumulated silt banks, over-grown vegetation to restore water course cross sectional area and alleviate localised flooding
- **Ward End Pool and Small Heath Pool** - Investigation and clearing main overflow control structures to prevent localised flooding
- **Cole Hall Lane (River Cole)** – Clearance of major blockages consisting of fallen trees and urban debris to restore channel capacity to prevent localised flooding

On behalf of **Highways:**

- **Section 38 agreements / Highway Improvement Schemes** – technical advice for highway Sustainable Urban Drainage Strategies (SuDS) and adoption.
- Working on **highway surface water problems and flooding issues** to help promote improve maintenance regimes and improvements to the Highway Drainage infrastructure to reduce flooding properties internally.

2.6.6 Reservoir Works provided for BCC Leisure Services

- **Keepers Pool, Sutton Park** - Commission of an Archaeological Survey of the Dam which will help inform future proposed improvement work and a Flood Study of the reservoir and outlet arrangements, with recommendations in order to satisfy current guidance.
- **Lifford Reservoir, Kings Norton** – Work on site to provide a minimum flood freeboard of 0.6m under design flood conditions, in the form of raising the low spots in the crest, construction of a dwarf wall at the rear of the spillway to join with raised crest, and reconstruction of a stair cast up the dam embankment. Production of as Built Drawings and Inspection and sign of by Reservoir Engineer.
- **Longmoor Reservoir, Sutton Coldfield** – Fitting of new spindle and gears and accessories as refurbishment works to existing penstock

- **Manor Farm Park Pool, Shenley Fields**, Desilting work and creation of an island within the pool to improve water quality and habitats.
- **Powells Reservoir, Sutton Park** – Repairs to the existing brick and concrete spillway slabs and reconstruction of expansion joints to restore structural integrity. Erection of new permanent safety steel fencing
- **Reservoir Act 1975 Section 10 and 12** - Inspections City Wide.
- **Salford Reservoir, Aston** - Removal of self-seeded saplings on downstream edge of crest to secure integrity of dam as instructed by Reservoir Engineer, erection of new water level gauge board, new penstock keys and repair work to scour demarcation buoy.
- **Shenley Fields Pool, Shenley Fields** – Construction of a new chamber incorporating a penstock that can be operated from ground surface, jetting of feeder pipework and closed-circuit television (CCTV) condition Survey.
- **Swanshurst Reservoir, Springfield** – Under pinning outlet headwall slabs and providing rip rap boulders to prevent erosion of stream just downstream of scour outlet.
- **Trittiford Reservoir, Billesley** – Repair work to Scour outlet headwall including a new path to the headwall to improve access as directed by Inspection Engineer. Erosion control measures at auxiliary spillway and to the rear of fixed height kerbing, construction of additional fixed survey points. Removal of bush vegetation and fallen trees on dam embankment to improve grass growth as directed as a Statutory duty by Inspection Engineer
- **Valley Parkway Pool, Bournville** – Reconstruction of pool edges with structural concrete, repairs to points of leakage, desilting and improved inlet arrangements. Installation of a new penstock structure
- **Witton Reservoir, Erdington** - Work to repair existing survey points, removal of vegetation on concrete spillway and repair work to expansion joints.
- **Wyndley Reservoir, Sutton Coldfield** – stabilisation works to channel to restore overflow operation, maintain water levels and prevent erosion.

2.6.6 Flood Warning Expansion

The Flood Risk Management Team have been working with the Hydrometry teams at the Environment Agency to locate areas which do not currently have a flood warning service in place and locations for level gauges and rain gauges to better inform the Flood Warning Direct (FWD) service that the Environment Agency offer. The current locations agreed with the Environment Agency are on the Bourne Brook, Perry Brook and the Plants Brook in Sutton Coldfield.

3. Flood Risk Regulations Duties

The Flood Risk Regulations implement the EU Floods Directive in England. They provide a framework for managing flood risk over a 6 year cycle, comprising:

- Preliminary Flood Risk Assessment (PFRA)
- identification of areas of potential significant risk, referred to as Flood Risk Areas (FRAs)
- mapping of flood hazards and risk and
- Flood Risk Management Plans (FRMPs), setting out measures and actions to reduce the risk.

Lead Local Flood Authorities worked with the Environment Agency to publish the first set of Flood Risk Management Plans, covering the 10 river basin districts in England, on 17 March 2016.

These plans set out how Risk Management Authorities are working together, and with communities, to manage flood and coastal risk over the next 6 years up to December 2021.

For the Flood Risk Management Plan 2 update in 2021, we have worked with the Environment Agency and neighbouring Councils to amend, transition and bring forward measures for the next 6-year cycle. Birmingham is noted, along with other large, dense conurbations as a Flood Risk Area, as there are a significant number of people, infrastructure and businesses, susceptible to a range of sources of flood risk. Birmingham is noted as a pluvial (surface water) Flood Risk Area and the Environment Agency have designated Sparkhill as a Fluvial (River) Flood Risk Area, from the River Cole, and duly updating the Flood Risk Measures for this area.

A high-level analysis of the 30-year ‘Risk of Surface Water Flooding’ dataset (high-risk) shows that there are 39 properties and 3 businesses at risk in Sparkhill Ward. There are 1,785 people (average household size) within the Sparkhill Flood Risk Area, with 358 properties at medium risk, and 386 at risk overall.

There are also 119 non-residential properties, with 66 at risk, as taken from the ‘Flood Risk Maps for Rivers and Sea in England - December 2019. The Social Flood Risk Index recognises Birmingham as one of the ten most flood disadvantaged local authorities in UK, and provides the most direct measure of flood disadvantage. Birmingham is also in the top ten for the ‘*Expected Annual Damages (EAD, £m) - Residential only*’ metric.

4. Statutory Consultee Role for Planning

The Lead Local Flood Authority is a statutory consultee for surface water on major developments (10 dwellings or more; or equivalent non-residential or mixed development). Local planning decisions are expected to ensure that Sustainable Urban Drainage Strategies (SuDS) for the management of runoff are put in place unless demonstrated to be inappropriate and that the sustainable drainage system should be designed to ensure that the maintenance and operation requirements are economically proportionate.

The number of applications, discharge of conditions and pre-app enquiries in between 2017 and 2020 is as follows:

Year	Total No. of Applications	Major Planning Applications	Pre-App/General Enquiries	Discharge of Condition
2017	405	185	94	126
2018	392	140	83	169
2019	577	274	59	322
2020	613	285	32	210

The statutory consultee role ensures that proposed developments and surface water drainage schemes are future-proofed in line with the National Planning Policy Framework (NPPF), with appropriate climate change allowances and conforms to the Council’s planning policies, Birmingham Development Plan, Big City Plan, and other planning documents.

The LLFA has been a key consultee in the development of Rea Valley SPD which is the largest city brownfield regeneration scheme in England. Advising on flood risk, drainage and the creation of community scale green and blue infrastructure. We have also been providing detailed advice and guidance in relation to the new urban extension to the City in Peddimore, Sutton Coldfield and the creation of a naturalised Langley Brook and community scale SuDS.

We are working with planning colleagues to improve ways of working and to form a framework for better responses and to inform planning applications more efficiently and effectively. We are discussing validation requirements, and the provision of standing advice for low-risk applications to lessen the burden on the statutory planning role within the Flood Risk Management team and to

provide timely advice back to the planning teams. In turn, we are assisting the enforcement officers with high-profile cases to advise on drainage issues and likely causes of flooding. In the future, we hope to work with Planning and Planning enforcement to act as an internal consultee / consultant to advise upon unpermitted and any development not in accordance with the approved details, which impact upon flood risk or drainage. The Flood Risk Management team also act as facilitator between the Council and other risk management authorities and can use the Flood Risk Management team's experience to better inform and warn those at flood risk. The team have continued to inform and respond to planning applications despite a third-fold on previous application numbers.

By informing Birmingham City Council policy, it is through strategic planning policies where we can inform major development most effectively – and having an over-riding drainage and flood risk policy such as TP6 helps to detail the surface water rates and volumes and required planning mitigation to ensure a high quality and sustainable development. The LLFA continues to influence planning applications and secure developer contributions whilst responding to changes to the planning system, ensuring that proposals are in line and proportionate to new guidance and amendments to the GDPO and 'use' classifications. We have also given detailed pre application advice internally to highways, and the Birmingham Housing Development Team, to help ensure that sites that are sensitive to flooding are appropriately designed to reduce and mitigate those risks, and the sites have the optimum number of new homes.

The LLFA has also had a key role in the regulation of HS2 construction and ensured that they are taking action to naturalise and improve watercourses, incorporate SuDS wherever possible and limit discharge rate as far as practicable to the greenfield run off rate from their new developments.

5. Funding

5.1 Funding Streams

Funding for Lead Local Flood Authority

Funding for Lead Local Flood Authorities to meet the duties under the Flood Water Management Act is provided to Birmingham City Council as part of the Local Government settlement. This funding is not ring-fenced and the budget for the Flood Risk Management Team was reduced due to financial pressures on the Council.

New Partnership Funding Calculator

On 17 April Defra and the Environment Agency published new guidance on partnership funding for flood and coastal erosion risk management. The changes are part of a suite of initiatives to help deliver the ambitions of the 25 Year Environment Plan and the new FCERM strategy. The Partnership Funding rule changes include:

- Updating payment rates to reflect inflation and new evidence on flood damages since 2011 (including people impacts such as mental health);
- Amending the flood risk bands for qualifying schemes to add a new intermediate risk band between high and medium risk. This will mean more schemes that reduce surface water flood risk are likely to receive government funding in the future;
- Accounting for the future impacts of climate change by also including people and properties that would potentially become at risk over the lifetime of a project;
- Improving the payment rates for environmental benefits to capture more fully the wider environmental benefits delivered by flood and coastal erosion risk management projects and to help support nature-based solutions.

Revenue Budget

A small budget is provided to support flood management responsibilities, these include land drainage, maintenance of ordinary watercourses and emergency response. This budget has reduced over recent years in line with City Council budget cuts. A risk-based approach is undertaken to ensure that high risk grills are cleared before and after heavy rainfall as the strategic grills have a real impact on flood risk if left occluded.

Flood Defence Grant in Aid - Partnership Funding

In the past, flood risk management schemes were generally funded by central government through the Flood Defence Grant in Aid (FDGIA) process which allocated funding to projects nationally based on cost/benefit prioritisation. This led to only schemes that scored highly in terms of benefits outweighing costs being taken forward.

From 2012 a revised approach has been undertaken. Funding levels for each scheme, paid by central government as Flood Defence Grant in Aid, relate directly to the benefits the scheme delivers, including number of households protected, damages prevented, deprivation, environmental benefits and amenity improvement. If the FDGIA does not cover the cost of the scheme, in order to progress a scheme the cost / scope can either be reduced and/or local contributions would need to be found. In 2020, the Environment Agency published a new Partnership Calculator, with overall improved grant rates for surface water schemes.

Local Levy

The City Council pays levies to the Environment Agency as Local Levy, in 2018/19 the Local Levy contribution was £288,047. The Local Levy is raised by the Regional Flood and Coastal Committee (Birmingham sits within the Trent Committee area) and is used as a locally-raised source of income to fund projects within the Trent region. It can be used to fund projects that might not be eligible for national funding or as a regional contribution to scheme costs under the partnership funding approach. For 20/2021, this figure has increased to £293,808, with a 2% increase in real terms, above current levels. It is envisaged that Birmingham will aim to draw down £325,000 in Local Levy monies over the next 6-year pipeline.

The amount raised from each Local Authority is based on the number of Council tax band D properties which has been agreed as a fair and equitable basis for the calculation. A 2.2% increase was approved by the RFCC in 2020, generating an additional £42,746 across the Trent RFCC area.

In February 2021, Birmingham City Council has been offered a representative position on the Trent Regional Flood and Coastal Committee Financial sub-committee. As the largest Council in the Trent RFCC area and as the largest Unitary Council nationally, this is an important step to understanding the nuances of Local Levy bid appraisal and the approval criteria of the sub-committee. This representation will serve the Council well, and BCC will be able to maximise our Local Levy we contribute as a Council and have a say where Local Levy should be used across the Trent RFCC area.

DEFRA Boosting Action for Surface Water

DEFRA's national project called Boosting Action in Surface Water is a competitive funding stream working in conjunction with Lead Local Flood Authorities who have put forward successful bids which are elevated and assured by DEFRA. Birmingham City Council has been successful in one bid for Druid's Heath and will be improving mapping and modelling in this area by the end of 2021. This project and the modelled outputs have been delayed due to furloughed staff and other BCC and supplier priorities and has recommenced in January 2021. The outputs of this project will be used to develop a long-term strategy to manage the flood risk throughout the Druids Heath catchment. It is also anticipated that the improved mapping and modelling will support the wider internal regeneration aspirations of the area

5.2 Funding Pressures

Historic reductions in budget due to savings requirements have made it increasingly difficult to fulfil the duties under the Flood and Water Management Act, carry out the statutory consultee role for planning and undertake maintenance of flood risk management assets and provide emergency response.

The Partnership Funding process has resulted in a range of funding sources being required to promote and deliver flood risk management schemes. For some schemes this includes an element of Flood Defence Grant in Aid together with an element of Local Levy but for many schemes this still leaves a shortfall which needs to be provided as third-party contributions. This approach puts significant pressure on limited resources to foster agreements and collaborations to facilitate schemes. In order for these schemes to progress local contributions or contributions from beneficiaries of the schemes need to be sought.

Aligning funding sources and facilitating the promotion of projects as well as seeking new funding opportunities continues to be a major priority for the Strategic Flood Risk Management Board and Flood Risk Management team going forward into 2020/2021.

The Flood Risk Management team are a highly technical team and as from January 2020, are fully staffed with a manager in post. The team are able to cope with the majority of demands in terms of projects, schemes, planning consultations and community engagement. Whilst we endeavour to be pre-emptive, there will always be an element of having to react to conditions and weather events as they develop. Although we can prepare for the challenge of climate change, as a Council, we will also need to develop an improved understanding of our reliance upon historic and aging infrastructure and work closely with partners, Members and communities, to upgrade systems where necessary and to find funding streams to enable us to become more resilient for the future.

6. Scrutiny: Previous Actions for Improvement

Subsequent to the flooding on 27th May 2018, a motion was passed at the Birmingham City Council meeting on 12th June 2018 calling for an inquiry into the floods of May 2018, to be carried out promptly. The motion called for the inquiry to include strong resident input and for the report to be debated as a main agenda item at a future City Council meeting. The review was conducted by members of the Sustainability & Transport O&S Committee on 19th July 2018. A number of areas for improvement were noted in the subsequent investigation report. Progress against each area for improvement is outlined below.

6.1 Emergency Response Procedures

Area for Improvement: ***This flood was significant and although not classified as a Major Incident and no triggers to activate the Emergency Arrangements were met, the impact was significant for all those concerned. The lack of notification and alerting by strategic partners resulted in the City Council not being able to establish the level of coordinated support it would wish. As part of a wider review, the City Council is enhancing its response and emergency arrangements, lowering the triggers to alert the Resilience team and ensuring their involvement. It is also working with strategic partners to ensure that more robust notification of incidents occurs. These changes are needed to provide residents and businesses with a more coordinated support package both during and after such flood events which meet the changing needs of residents during the recovery cycle.***

Update: The Council's Emergency Plan has been reviewed and an interim update has been issued with the latest version was published in March 2019. All core council roles within the plan have been identified and training provided and activation of the duty officer (Council) remains key to activating any of our arrangements. The proactivity of the duty officer has been increased and

we are actively promoting the notification of Birmingham City Council from partners (and following up any missed notifications) by partners. In heavy storms and thunderstorms, the FRM team monitored rainfall, undertook site visits and checked river levels and informed those Flood Action Groups at risk.

6.2 Model Constitution or Model Template for Flood Action Groups

Area for Improvement: ***During the evidence gathering there was an offer of support from the National Flood Forum to liaise with the City Council and to provide advice, mentoring and support to local residents wishing to set up a FLAG. It is hoped that Birmingham City Council will respond positively to this offer and that a model constitution or model template for FLAGS can be produced which can be made available as a resource to support local people to set up and run FLAGS in their area. However, as with any potential provision of support from the NFF to supplement the Birmingham City Council functions (either through establishing FLAGS or supporting citizens in recovery following an incident), funding will need to be identified and a clear understanding of what will be delivered for that funding will have to be agreed with the NFF and potentially other partner organisations.***

Update: The Birmingham City Council Resilience team have been supporting FLAGs as much as it can alongside their other duties, since the floods in May 2018. Birmingham City Council working in partnership with the Environment Agency intends to promote the existing FLAG template prepared by the National Flood Forum. Flood Risk Management and Resilience will be considering how the NFF can support Birmingham City Council in the future. With a fully staffed team from 2020, the FRM team have been able to and can further assist communities with setting up FLAGs and attending public virtual meetings. Groundwork West Midlands have been commissioned by the Environment Agency to support the FLAG in in Sparkhill by increasing personal resilience and to provide training to Flood Action Group members. Due to COVID-19, any public events were cancelled, however Groundwork look to continue this project later in 2021.

In terms of the National Flood Forum, the Flood Risk Management team and the NFF have worked closely together to submit a sizeable bid to the EA's Innovation Fund for a waste management, flood risk and environmental improvement drive across Sparkhill, Sparkbrook and Balsall Heath East and West. As a nationally competitive bidding process, no decisions have yet been made by the Environment Agency regarding which bids have been successful.

6.3 Traffic Management during flood events

Area for Improvement: ***The issue of Traffic Management during flood events needs to be followed up with both West Midlands Police and National Express West Midlands and other bus operators to make sure that a mechanism is put in place to ensure that traffic is re-routed and diverted away from flooded areas during a major incident.***

Update: Whilst it remains an operational consideration of all transport providers as to their routing, when activated, there are links and mechanisms in place to engage transport providers by Birmingham City Council as part of all our arrangements, the duty officer is able to contact transport providers and will endeavour to in a prioritised way (e.g. after dealing with risk to life and similar resident issues).

6.4 River Cole Valley Partnership

Area for Improvement: ***A River Cole Valley Partnership arrangement should be pursued by the Environment Agency along the lines of the arrangements already in existence for the rivers Rea and Tame, to facilitate the provision of flood defence and flood alleviation measures along the River Cole Valley.***

Update: The Environment Agency and Birmingham City Council have been working together since the floods of 2007 to develop flood alleviation measures along the River Cole valley. Over this

time a number of partnerships have been developed including a joint study with Severn Trent Water and Solihull Metropolitan Borough Council. A number of options have been examined all of which failed to meet the central government cost benefit ratio for flood defence schemes.

The Environment Agency and Birmingham City Council have worked in partnership to undertake a debris removal along the River Cole since the flood event in May 2018. This work will reduce the risk of channel blockages and improve the conveyance of flows through the river.

In addition to this, the Environment Agency has been undertaking a programme of removing Japanese knotweed along the River Cole since 2018 as part of a 5-year eradication programme. This work will reduce the risk of damage to essential flood risk infrastructure.

The Environment Agency and Birmingham City Council have had further discussions since the 2018 flooding about developing a flood risk management scheme to offer protection to properties along the River Cole corridor including reviewing the risk status of the river and potential enchainment to identify funding opportunities.

The Environment Agency has suggested that a catchment wide approach to managing flood risk needs to be taken to develop a programme for the next central government funding cycle (2021 - 2026). It has been agreed to invite Solihull and Worcestershire, as neighbouring Lead Local Flood Authorities to form a catchment Partnership with Birmingham City Council and the Environment Agency to undertake an optioneering exercise to identify potential options for reducing flood risk.

In February 2020, Birmingham City Council set up a River Cole Working Group consisting of BCC Housing, Flood Risk Management and the Environment Agency to explore a catchment-based approach, suitable alleviation measures and funding opportunities to enable a suite of options to present to wider stakeholders and adjoining Councils in the upper reaches of the River Cole catchment. This information will be used to assess the number of properties at risk of flooding within the catchment and to assess funding opportunities through Grant in Aid, Local Levy and partnership contributions. We continue to press the Environment Agency for an alleviation scheme, given the known risk to communities along the Cole valley.

7. Improvements

7.1 Flood Risk Management Team Pro-active Measures

The Team has a close dialogue with our Honorary Alderman who holds the Flooding Portfolio (on behalf of and in liaison with, the Cabinet Member) and continue to work closely with elected members and other teams to address flooding concerns and issues in their respective areas. We remain supportive, and endeavour to attract funding to help allay flooding and drainage and work with other teams to improve existing and inform proposed sites through Consenting and Planning. Birmingham is represented on the Trent Regional Flood and Coastal Committee (RFCC) and now have a regular representative on the Trent Financial Sub-Committee (FSC) to ensure that we maximise and realise funding opportunities as the biggest financial contributor of Local Levy in the Trent Regional Flood and Coastal Committee. It is important that our views are heard and that we work closely with other risk management authorities in partnership.

Developing HMOS (Hydraulic maintenance of Structures) to help inform prioritisation for a capital programme of important flood risk assets, mainly related to bridge and culvert structures. We have also been working with Highways Asset teams and Kier to identify areas which would benefit from highway drainage improvements.

7.2 Flood Risk Management Audit

In early 2020, the Flood Risk Management team were audited for all aspects across the service area including, but not limited to:

- Co-ordination and monitoring arrangements established for flood management within the Directorate and across the Council as appropriate;
- Partnership working arrangements established with all relevant Risk Management Authorities and relevant external organisations;
- Arrangements for ensuring a Local Flood Risk Management Strategy for Birmingham has been established and is being kept up to date;
- Systems established to identify and prioritise any maintenance or improvement works required on the Council's watercourses ;

Mechanisms in place to ensure planning applications / any new development schemes are considering and identifying all appropriate measures to address potential flooding risks;

- Drainage Section's processes for identifying and obtaining appropriate sources of external funding to help support the Council in achieving its responsibilities as a Lead Local Flood Authority and a Land Drainage Authority.

The team have worked closely with our internal auditor and had positive feedback received with regard our processes and record-keeping. We hope to use the findings of the audit, when published in 2021, to develop agreed processes with our Finance, Procurement and Legal colleagues.

7.3 Consultants

Due to being fully resourced from January 2020, the Flood Risk Management team have been able to reduce reliance upon external support and Consultants. This has lessened the amount of external spend and we've ensured that the team can perform all statutory roles in-house and improve dialogue between the Flood Risk Management team, Planning and Housing teams. The team are highly experienced in writing business cases, developing local engineering measures and options and liaising with communities and landowners. The team will continue to upskill where required and attract funds to enable the team to develop schemes whilst drawing on Consultant support for hydraulic modelling and other time / resource-intensive projects.

Appendix A - Flooded Sites Action Tracker