BOROUGH PLAN BACKGROUND PAPER: Managing Flood Risk and Water Quality

Nuneaton and Bedworth Borough Council

2015

Nuneaton & Bedworth
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CONTENTS

1. INTRODUCTION

1. This paper sets out the policy background and evidence based studies that have been used to develop the policy on Managing Flood Risk and Water Quality.

2. LEGAL BACKGROUND

Water Framework Directive, 2000/60/EC

1. The Directive requires all inland and coastal waters to reach 'good chemical and ecological status' for surface waters and 'good status' for groundwater in terms of quality and quantity by 2015. River Basin Management Plans are required to provide the context for the co-ordination of water management for the river basin.

Assessment and Management of Flood Risks (Floods), Directive 2007/60/EC

2. The Floods Directive requires assessment of all water courses and coast lines at risk from flooding. The purpose is to map the flood extent, the assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.

Flood and Water Management Act 2010

3. Relevant key features of the Act are:
    - To give the Environment Agency an overview of all flood and coastal erosion risk management and unitary and county councils the lead in managing the risk of all local floods.
    - To introduce an improved risk based approach to reservoir safety.
    - To encourage the uptake of sustainable drainage systems by removing the automatic right to connect to sewers and providing for unitary and county councils to adopt SUDS for new developments and redevelopments.
    - To provide for a Lead Local Flood Authority (LLFA), in this case Warwickshire County Council. The LLFA will bring together all relevant bodies – district councils, internal drainage boards, highways authorities, water companies and the Environment Agency to help manage local flood risk. Local flood risk includes surface run-off, groundwater and ordinary watercourses (including lakes and ponds). The LLFA, working with local partners, is to develop, maintain, apply and monitor a strategy for local flood risk management in its area.

4. Alongside the Act, the Flood Risk Regulations 2009 will implement the Floods Directive in England and Wales. These regulations outline the roles and responsibilities of the various authorities consistent with the Flood and Water Management Act and provide for the delivery of the following outputs, as required by the Directive:
    - Preliminary Flood Risk Assessments (PFRAs), which will allow the identification of areas of potential significant risk.
    - Maps showing impact and extent of possible future significant flood events.

- Flood risk management plans, identifying how significant flood risks are to be mitigated.

3. POLICY BACKGROUND

National Planning Policy Framework (DCLG, 2012)

1. The Government's objectives in relation to climate change, flooding and water are set out below alongside the Council's policy approach:

Relevant NPPF requirement	NPPF sub requirement	Relationship with policy
99. Local Plans should take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.		The Managing Flood Risk and Water Quality policy points to the relevant local documents to plan for development at areas away from areas at highest risk of flooding. It includes measures to ensure flood risk is not increased elsewhere. Other policies cover water supply, biodiversity and landscape.
100. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources,		The Managing Flood Risk and Water Quality policy points to the relevant local documents to plan for development at areas away from areas at highest risk of flooding. It includes measures to ensure flood risk is not increased elsewhere. The relevant local documents are the Strategic Flood Risk Assessment Level 2 and Warwickshire Surface Water Management

Relevant NPPF requirement	NPPF sub requirement	Relationship with policy
taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:		Plan. The policy has also taken account of the River Basin Management Plans and local updates for the Humber and Severn.
	applying the Sequential Test;	The Council relies on the NPPF and accompanying guidance.
	if necessary, applying the Exception Test;	The Council relies on the NPPF and accompanying guidance.
	safeguarding land from development that is required for current and future flood management;	The Strategic Flood Risk Assessment or site specific work does not identify any such land.
	using opportunities offered by new development to reduce the causes and impacts of flooding; and	The Strategic Flood Risk Assessment and site specific work identifies such opportunities.
	where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.	The Strategic Flood Risk Assessment indicates that Nuneaton town centre will need to consider the types of uses that are suitable due to potential flood risk.
101. The aim of the Sequential Test is to steer		The Council relies on the NPPF and accompanying

Relevant NPPF requirement	NPPF sub requirement	Relationship with policy
new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.		guidance. The Council has taken account of the sequential test when determining site locations for new development. The Strategic Flood Risk Assessment is a key document in this respect. The Managing Flood Risk and Water Quality policy recognises the need for planning applications to meet the requirements for site specific flood risk assessment.
102. If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed: ●it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and ●a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the		The Council relies on the NPPF and accompanying guidance.

Relevant NPPF requirement	NPPF sub requirement	Relationship with policy
vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. Both elements of the test will have to be passed for development to be allocated or permitted.		

2. Further guidance is set out in a Technical Appendix to the NPPF.

River Basin Management Plans

3. River Basin Management Plans (RBMPs) are a requirement of the Water Framework Directive. They focus on the protection, improvement and sustainable use of the water environment for each River Basin District (RBD) and are prepared by the Environment Agency and are a continuous process of planning and delivery over six year cycles. The Environment Agency and partners are currently preparing the second round of RBMPs based on revised management catchment areas.

4. There are two RBMPs that impact on the Borough:

   - The Humber River Basin Management Plan, which broadly covers the Nuneaton area;
   - The Severn River Basin Management Plan, which broadly covers the Bedworth area.

5. Two local Management Catchment areas are relevant to Nuneaton and Bedworth:
   - Avon Warwickshire Management Catchment (Severn)
   - Tame, Anker and Mease Management Catchment (Humber)

6. The quality of water bodies has declined since 2009. To help the process of updating the River Basin Management Plans, the Environment Agency has worked with partners over the past two years to:
   - Agree what the main problems are that are stopping there being a healthy water environment in the Avon Warwickshire and Tame, Anker and Mease;
   - Decide how it should work with others to address them.

7. The Environment Agency has prepared summaries for each Management Catchment to help to explain progress with the river basin management planning

process so far, at a more local scale. The summaries include initial economic appraisals to identify what actions are most cost beneficial.

8. The Severn River Basin District is split into catchments including the Avon Warwickshire Management Catchment. This in turn has been divided into 3 operational catchments, which incorporate several groundwater water bodies. The operational catchments have distinct characteristics and pressures, and require a different mix of measures to achieve long-term objectives for the water environment and reduce the risks of flooding. The Avon Urban Operational Catchment is relevant for Nuneaton and Bedworth.

9. The Avon Urban Operational Catchment includes the rivers Sowe, Sherbourne, Arrow and Alne and the conurbations of Coventry, Redditch and Alcester. It is largely urban, although arable farming is the main land use activity in the south. Water abstraction for industry and public drinking water supplies is significant within the catchment, including a number of potable groundwater abstractions. The catchment provides a variety of recreational activities including angling, sailing and water sports. Designated sites in the catchment include Sites of Special Scientific Interest at Bittell Reservoir in the Upper Arrow Valley and Brandon Marsh near Coventry.

10. There are 20 river water bodies, 3 canal water bodies, 1 lake, 0 estuarine & coastal waters and 1 groundwater water bodies in this catchment. The status (health) of the water environment in 2009 was assessed as being generally moderate. In 2014, the status of the water environment had fallen. It can take 5 to 10 years for the positive benefits of actions to be reflected in the ecological status. The current analysis suggests that 59% of the water bodies in the Avon Urban catchment should have a long term objective of achieving good status.

11. The Humber River Basin Catchment District is split into catchments including the Tame Anker and Mease Management Catchment. This in turn has been divided into 6 operational catchments that also incorporate several groundwater water bodies. The operational catchments have distinct characteristics and pressures, and require a different mix of measures to achieve long-term objectives for the water environment and reduce the risks of flooding. The Sence, Anker and Bourne Operational Catchment is relevant to Nuneaton and Bedworth.

12. The Sence, Anker and Bourne Operational Catchment is a mixed urban and rural catchment with Hinckley, Nuneaton and Atherstone draining to the River Anker, Sketchley and Wem brooks, and more rural land, used for agricultural production around Coalville, Ibstock and Fillongley, draining to the rivers Sence and Bourne. Several water bodies within the urban areas have been heavily modified due to urbanisation and flood risk management. The Coventry and Ashby canals cross the catchment. The River Bourne is within a designated drinking water protected area and the entire catchment is a designated Nitrate Vulnerable Zone. There is a history of mining within the catchment.

13. Since 2009, investigations in the catchments have helped to determine the reasons why water bodies are not achieving good status, and the likely causes. These include:

	Avon Warwickshire – Urban Operational Catchment	Tame, Anker & Mease – Sence, Anker and Bourne Operational Catchment
Reason	Sectors	
Changes to the natural flow and levels of water	Water Industry, Navigation	-
Natural Conditions/Suspect Data	Unable to assign to a sector	Unable to assign to a sector
Negative effects of non-native species	Unable to assign to a sector	-
Other pressures	Industry, Manufacturing and Other Business	-
Physical modifications	Urban and transport, Navigation, Unable to assign to a sector, Agriculture and rural land management	Water industry, Unable to assign to a sector
Pollution from mines	-	-
Pollution from rural areas	Agriculture and rural land management	Agriculture and rural land management
Pollution from towns, cities and transport	Urban and transport	Urban and transport
Pollution from waste waters	Water Industry, Domestic/general public.	Water Industry, Urban and transport, Domestic/general public.

Measures to improve the water environment have been assessed. Some of these measures will benefit more than one water body or catchment and some are very specific. The cumulative effect and benefits of measures for the operational catchments have been considered. The measures proposed for each catchment are shown in the table below.

Measures	Avon Warwickshire – Urban Operational Catchment	Tame, Anker & Mease – Sence, Anker and Bourne Operational Catchment
Improve modified physical habitats		
• Removal or easement of barriers to fish migration	✓	✓
• Removal or modification of engineering structure	✓	✓
• Improvement to condition of channel/bed and/or banks/shoreline	✓	✓
• Improvement to condition of riparian zone and /or wetland habitats	✓	✓
• Changes to operation and maintenance	✓	✓

Measures	Avon Warwickshire – Urban Operational Catchment	Tame, Anker & Mease – Sence, Anker and Bourne Operational Catchment
• Vegetation management	✓	
Managing pollution from waste water		
• Reduce diffuse pollution at source	✓	
• Reduce point source pollution pathways (i.e. control entry to the water environment)	✓	
• Mitigate/remediate point source impacts on receptor	✓	✓
Manage pollution from towns, cities and transport		
• Reduce diffuse pollution pathways (i.e. control entry to the water environment)	✓	✓
• Mitigate/remediate diffuse pollution impacts on the receptor	✓	
Improve the natural flow and level of water		
• Control pattern/timing of abstraction	✓	
• Improvement to condition of channel /bed and banks/ shoreline	✓	
Manage invasive non-native species		
• Early detection, monitoring and rapid response (to reduce the risk of establishment)	✓	
Manage pollution from rural areas		
• Reduce diffuse pollution at source	✓	✓
• Mitigate/remediate diffuse pollution impacts on the receptor		✓

14. The existing River Basin Management Plans indicate similar issues and measures. In terms of the Humber River Basin District, the main issues include:
    - Poor groundwater quality status is due to high or rising nitrate concentrations with failures for pesticides and chemicals associated with mine working.
    - Poor groundwater qualitative status is due to abstraction levels – mainly for drinking water – exceeding the rate at which aquifers recharge.
    - The rivers within the Tame, Anker and Mease Catchment pass through mainly urban areas including Birmingham, Solihull, Nuneaton, Tamworth and Burton-upon-Trent. Due to the highly urbanised nature of a large part of the catchment, the largest inputs to the system come from sewage treatment works.
    - Physical modifications due to urbanisation, water storage and supply and flood protection are key reasons for failures in the catchment.

15. In terms of the Severn River Basin District, the main issues include:
    - The catchment has a high value for wildlife and there are a large number of designated sites.

- Water quality problems are due to a mixture of the impact of sewage discharge, diffuse run-off (urban and Agricultural) leading to nutrient enrichment and other pollution.

16. Overall, the existing and proposed River Basin Management Plans indicate that spatial planning and design for urban development and infrastructure should aim to reduce surface water run off; protect and restore habitats; improve the quality of rivers, coastal waters, and groundwater, and thus protect drinking water supplies and bathing areas. The release of toxic pollutants that harm the water environment also needs to be reduced.

17. The key measures include:
    - Improving modified physical habitats;
    - Managing pollution from waste water
    - Managing pollution from towns, cities and transport;
    - Improve the natural flow and level of water;
    - Managing pollution from rural areas.

18. In terms of the Borough Plan, taking account of the existing and proposed River Basin Management Plans, the key measures for improving water quality relate to:
    - reducing the impact of diffuse pollution from rural and urban sources, for example, through the use of sustainable urban drainage systems;
    - remediating contaminated land and managing minewaters from abandoned mines;
    - Protecting and improving habitats;
    - Site specific measures.

Flood Risk Management Plans

19. The Floods Directive indicates that Flood Risk Management Plans are prepared for River Basin Districts. The Environment Agency and partners are currently preparing FRMPs for the relevant River Basin Districts for the area. It is expected that final FRMPs will be complete by December 2015. The Lead Local Flood Authorities for areas designated as a Flood Risk Zone have been involved in preparing the FRMPs. Nuneaton and Bedworth does not fall within such a zone.

20. Flood Risk Management Plans (FRMPs)
    - Summarise the risk of flooding from rivers, the sea, reservoirs, as well as from local sources of flooding such as sewers.
    - Draws relevant conclusions from the flood and hazard risk maps about risks and opportunities;
    - Sets out and prioritises what needs to be done to manage risks.
    - Shows how flood risk management measures co-ordinate with measures outlined through river basin management planning under the Water Framework Directive.

21. The Humber and Severn are the relevant River Basin Districts for the Borough. The Tame, Anker and Mease and the Warwickshire Avon are the relevant

catchments for Nuneaton and Bedworth areas respectively. The following key issues are raised by the draft FRMPs:

- The main sources of flood risk for people, property, infrastructure and the land are:
    - River flooding
    - Reservoir flooding
    - Surface water and sewer flooding
    - Climate change
- There are major pollution issues across the Tame, Anker and Mease catchment from many different sources including diffuse urban drainage and run-off, contaminated land, point source water industry and other industrial discharges, urban miss-connections for foul water and diffuse agricultural / rural run-off from practices.
- Many watercourses across the Tame, Anker and Mease catchment are heavily modified or degraded. Improving the structure and ecological health of watercourses can greatly improve the resilience of the network to pollution, reduce peak flows, ameliorate flooding and reduce the impacts of extreme events on wildlife.

22. The FRMPs aim is to:
    - Look at areas of low to moderate flood risk to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.
    - Deliver a sustainable approach to flood risk management that considers the natural function of the river and recuse long term dependence on raised flood defences.
    - Collaboratively work and create partnerships to enable betterment of the catchment.
23. The main ongoing and proposed measures to manage flood risk on the Tame, Anker and Mease and the Warwickshire Avon catchments include:

Measures		Tame, Anker and Mease (Nuneaton)	Warwickshire Avon (Bedworth)
Preventing Flood Risk	Measures to avoid inappropriate development in the flood plain		✓
	Improving safe access and egress to areas of flood risk	✓	
	Maintaining watercourses		✓
	Improving understanding of all sources of flooding to inform future flood risk management		✓

Preparing for Risk	Develop and improve emergency response plans with partners	✓	
	Improving flood modelling and mapping to increase knowledge	✓	
	Maintaining and improving flood forecasting and warning systems	✓	
	Work to raise community awareness and improve their preparedness.	✓	
Protecting from Risk	Introduce property protection schemes		✓
	Maintain and replace where necessary major flood defence structures		✓
Recovery and review of risk	Reducing flood risk and improving resilience as a result of the findings of formal investigation of flood incidents.		✓

Catchment Flood Management Plans (CFMP)

24. The Catchment Management Plans are predecessors of the Flood Risk Management Plans. Prepared by the Environment Agency, CFMPs set out the scale and extent of flooding now and in the future and include long term policies for sustainable flood risk management within the catchment. CFMPs should be used to inform planning and decision making.

25. There are two CFMPs that impact on Nuneaton and Bedworth Borough: The River Trent, relevant to Nuneaton, and the River Severn relevant to Bedworth.

26. For the River Trent CFMPs, the relevant sub area for Nuneaton is the Upper Soar and Upper Anker. The sub-area is within Policy Option 4. This is an area of low, moderate or high flood risk where flood risk is being managed effectively but where further actions to keep pace with climate change will be required. This is an appropriate policy because, although the risk is currently managed, the risk is expected to rise significantly in the long term.

27. Flooding results from lack of capacity in the river channels and the floodplains becoming inundated. Leicester and Nuneaton are near the headwaters of their respective catchments and are therefore at risk from rapid runoff.

28. The key messages from the Sub-Area:

- Assess long term opportunities to move development away from the floodplain and create green river corridors.
- Work to minimise the cost of flood damage in Nuneaton taking into account future climate change and urban growth.
- Return watercourses to a more natural state, increasing biodiversity and opening up green river corridors.
- Sustain and increase the amount of BAP habitat in the catchment.

29. For the River Severn CFMP, the relevant sub area for Bedworth is the Telford, Black Country, Bromsgrove, Kidderminster and Coventry Cluster. This includes the Warwickshire Avon. This sub-area falls within Policy Option 5. This is an area of moderate to high flood risk where further action can generally be taken to reduce flood risk. The CFMP states this policy is about reducing the risk where the existing flood risk is too high and action is needed in the short term to reduce this level of risk.

30. This sub-area is predominantly urban and contains several major urban centres, including Coventry and Bedworth.

31. The key messages from the Sub-Area:
- Surface water flooding is a growing problem.
- Development/redevelopment must be managed to minimise flood risks. Methods must be sustainable over the long-term. For example, making more space for rivers through urban areas via 'blue corridors' (i.e. restoring access for floodwater onto key strips of floodplain. This requires redevelopment to be limited to flood-compatible land uses e.g. parkland.)

32. In the future, the CFMPs indicate that flooding will be influenced by climate change, changes in land use (for example urban development) and rural land management. In both the River Severn and River Trent catchments, climate change will have the greatest impact on flood risk.

33. In terms of the Borough Plan, the River Trent and River Severn Catchment Flood Management Plans and the emerging Humber and Severn Flood Risk Management Plans indicate the following measures are required to reduce the risk of flooding:

- Directing development away from the floodplain;
- Slowing rates of run-off in the upstream catchment to reduce surface water flooding (particularly in Bedworth);
- Better understanding of the interaction between river and surface water flooding to help identify solutions in urban areas;
- Assessing long term opportunities to move development away from the floodplain and create green river corridors;

- Taking into account future climate change and urban growth;
- Returning watercourses to a more natural state, increasing biodiversity and opening up green river corridors;
- Protecting and increasing the amount of BAP habitat in the catchment;
- Making more space for rivers through urban areas via 'blue corridors' i.e. restoring access for floodwater onto key strips of floodplain.

Shaping our Future - Sustainable Community Plan 2007-2021 for Nuneaton and Bedworth

34. Theme 4: Sustainable Borough aims to have a high quality environment with increased biodiversity and a sustainable approach to waste and energy. The Local Strategic Partnership will work together to tackle climate change.

Emerging Borough Plan

35. The following Strategic Objectives are relevant to the Managing Flood Risk Policy:

Objective 7

4.8 To ensure that new development enhances and improves the quality and appearance of the existing urban area. In particular:

a) Important open spaces such as Riversley Park, Miners Welfare Park, Whittleford Park and Community and Local parks are protected and enhanced. Landscape character, historic, geological and natural features such as Arbury Historic Park and Garden, Stockingford Railway Cutting and Ensor's Pool are protected and enhanced.

b) Derelict, contaminated and untidy sites are brought back into beneficial use.

c) Minimise the negative impact of development and make improvements where possible to air quality in Air Quality Management Areas.

d) Maximise opportunities to use the River Anker, Wem Brook, the Coventry Canal and Ashby Canal as attractive focal points for open space and new development where there is no negative impact on the green network or the water quality.

e) Infill development positively responds to local character and does not result in town cramming.

f) High quality and sustainable design and construction in line with design standards.

Objective 8

4.9 To address climate change and encourage sustainability in all new development. In

particular:

a) Avoid where possible sites that are at risk of flooding now or in the future.

b) Utilising appropriate sustainable urban drainage systems for flood or surface water attenuation and using water sustainably.

c) Protect and enhance the Borough's ecological network, in particular priority habitats and species and minimising impacts on biodiversity.

d) Maximise energy efficiency and the use of renewable energy, particularly those with greatest potential in the Borough. For example, combined heat and power district energy, biomass energy, ground source heat pumps, solar photovoltaics and solar thermal, along with any future renewable or low carbon technology that may become more suitable for the Borough during the plan period.

e) Ensure development makes links to cycling and walking networks to encourage green travel.

4. CONSULTATION RESPONSES

Issues and Options 2009

1. Consultation on Nuneaton and Bedworth Borough Council's Core Strategy Issues and Options took place between the 8th June and the 14th August 2009. Feedback received from the Issues and Options Core Strategy consultation (2009) is summarised below:

- There are key characteristics relating to the location and quality of local watercourses and basic hydrology of the localities on flood risk missing from the Spatial Portrait. For example, the Environment Agency designated main rivers are: River Anker, Wem Brook, Nuneaton Flood Relief Channel, Sketchley Brook, Harrow Brook and Change Brook. Coventry Canal and Ashby-de-la- Zouch canal are also important green corridors.
- The Nuneaton Flood Defence Scheme is maintained by the Environment Agency and is a significant flood defence infrastructure.
- Flooding and drainage are missing from the list of Key Issues. This is a significant omission given climate change predictions.
- Objective 7, which makes reference to avoiding development in the flood plain and ensuring sustainable drainage via the use of sustainable urban drainage techniques in construction, is welcomed.
- Flood risk is a key consideration when deciding which land to build on.
- Several areas are noted as places of concern in terms of recent flood events: Longshoot, St Nicolas Park, Skey Drive and the Bucks Hill Cemetery, Barpool Valley, Merevale Avenue and Tomkinson Road, Brookvale Road, Winster Close and Howat Road, Weddington, Delamere Road, Shawe Avenue, Weddington Country Walk.

• Floodplains have the potential to play an important role in extending the Borough's green infrastructure. These areas should be considered more positively rather than avoided. • Flood risk areas should be avoided in all cases. • An approach to development in flood zones in line with PPS25 – Development and Flood Risk is supported. Strategic Flood Risk Assessments should be used to advise on land allocated for development and essential infrastructure.

Preferred Options Borough Plan 2013

2. The Preferred Options Consultation lasted for eight weeks between 5/07/2013 and 30/08/2013. The policy aims to direct development away from areas of flood risk and protect river and groundwater quality. However, regardless of the policy's intent, a number of stakeholders felt the policy could be improved if their issues were addressed. These issues are summarised below:

General	• Comments were raised in relation there being a need to plan for climate change and the likelihood of more frequent flood events.
Environment Agency	• The policy should refer to relevant River Basin Management Plans in terms of water quality and restoring the functional flood plain. • The Council should use the Level 2 Strategic Flood Risk Assessment to guide development away from known areas of flood risk. • That the policy should require developers to require Site Specific Flood Risk Assessments in flood risk areas. • The policy should require surface water flows should to be equivalent to green field rates. • The policy should protect existing flood defence infrastructure • A new policy on water quality and groundwater protection should be included to reflect potential sources of contamination from the Borough's industrial legacy and to contribute to improving water quality in line with the Water Framework Directive. • The policy should aim to restore rivers to a more natural state to help reduce flood risk.
Woodland Trust	• The policy should promote tree and woodland planting as a way to reduce flood risk.

5. EVIDENCE BASE

UK Climate Projections

1. The United Kingdom Climate Impacts Programme (UKCIP) is the leading organisation in climate change scenarios and is useful in forecasting what the likely weather patterns will be in the future. These climate/weather scenarios are broken down regionally. Overall, for the West Midlands these suggest increases in temperatures for both winter and summer. Winters are expected to be wetter and summers drier than currently.

Strategic Flood Risk Assessment Level 1 (Halcrow, 2008)

2. The Strategic Flood Risk Assessment Level 1 (SFRA1) assesses and maps all forms of flood risk for Coventry, Solihull and Warwickshire. This information provides the basis for the Sequential Test to be applied to identify locations for future development in areas of least flood risk.

3. The SFRA1 summarises flood risk in Nuneaton and Bedworth including:
   - Main rivers and fluvial flood risk
   - Historical flooding
   - Flooding from surface water and artificial drainage sources
   - Flooding from impounded water bodies – canals and reservoirs
   - Flooding from groundwater
   - Climate change.

4. A summary of the fluvial flood risk is provided in Table 1.

Table 1: Fluvial Flood Risk

Main River	Flood Risk and Defences
River Anker Enters the Borough from the east by Stretton and flows in a north-westerly direction through Nuneaton and exits the Borough north of Weddington.	Affects people, property, and infrastructure in Nuneaton. Town benefits from Flood Relief Channel which protects more than 1000 properties from up to 1% AEP (1 in 100 year). Residential and commercial properties located in Flood Zone 2 through the town centre. Small number of properties located in Flood Zone 2 by Weddington. A number of properties are located in

Main River	Flood Risk and Defences
Bar Pool Brook is a tributary of the River Anker and joins the river through Nuneaton Town Centre.	Flood Zone 2, although there are some misalignments of the mapping. Parts of Queen Elizabeth Road adjacent to the balancing lake are vulnerable to flooding from Bar Pool and Whittleford Brooks and from flooding from surcharged sewers and overland flow from the Camp Hill Estate. Barpool Balancing Pond is designed to accommodate flows from the Bar Pool Brook. A number of properties are located in Flood Zone 2 at an unnamed tributary of the Bar Pool Brook.
Harrow Brook Enters the Borough from the north-east by Dodwells Bridge Industrial Estate and flows in a predominantly southerly direction along the Nuneaton and Bedworth and Rugby boundary and flows into the Anker.	Some properties along The Longshoot are located in Flood Zone 2. Properties also affected by overland flow. Minor works to a ditch course joining the Harrow Brook since 1999. Flood protection – a bund and pumping station – installed.
Wem Brook Enters the Borough as a non-Main River from the south east by Shilton and flows predominantly in a north westerly direction. At SP 3662 9118 it becomes a designated Main River, flowing in a northerly direction before joining the left bank of the River Anker.	A number of properties are located in Flood Zone 2.
Breach Brook Enters the Borough from the south west, forming the boundary between Nuneaton and Bedworth and North Warwickshire. Here it is considered a non-Main River. At SP 3334 8526 the watercourse becomes a designated Main River and flows in an easterly direction before joining the right bank of the River Anker.	A small number of properties are located in Flood Zone 2 where the Breach Brook meets the River Sowe by Exhall.

Main River	Flood Risk and Defences
River Sowe Becomes a designated Main River to the north of Bedworth Heath (where previously it was part of Bedworth Sloughs Brook) and flows in an easterly direction before turning in a southerly direction and exits the Borough around Rowley's Green.	A number of properties are located within Flood Zone 2 as the watercourse flows through the western edge of Bedworth.
Change Brook Enters the Borough by St Nicolas and flows predominantly in a south westerly direction and joins the River Anker at Sandon Park Recreation Ground.	A number of properties are located within the Flood Zone maps in the downstream extent as it joins the River Anker.

Flood Events in Nuneaton and Bedworth

5. There have been several major flood occurrences in the Borough, notably in 1968, December 1992 and July 2007. In June 1999 surcharged sewers and overland flow flooded parts of Exhall.

6. Severn Trent Water maintains a register of properties/areas at risk of flooding from the public sewerage system, referred to as the DG5 Flood Register. The Register includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. Information is the form of four digit postcode locations.

Table 2: DG5 Register of properties flooded

Post Code Area	N^{o} Properties Affected
CV10 0	13
CV10 9	1
CV11 4	1
CV11 6	3
CV12 0	8
CV12 8	3
CV12 9	11
CV2 1	1
CV6 4	4
CV7 8	4
CV7 9	4

7. Two canals, Coventry Canal and Ashby-de-la-Zouch Canal, course through the Borough. Nuneaton and Bedworth also has one reservoir at Sees Wood. The SFRA1 states that there are no records of any breaching of these impounded water bodies.

Strategic Flood Risk Assessment Level 2 (JBA Consulting, 2012)

8. The National Planning Policy Framework (NPPF) requires a Strategic Flood Risk Level 2 (SFRA2) to demonstrate that sufficient consideration has been given to flood risk at all stages of the planning process. The SFRA2 assesses the flood risk of the potential development areas (PDAs) that may be taken forward in the Borough Plan. The Assessment will enable the Council to select sustainable site allocations away from high risk flood areas and areas of greatest vulnerability of flooding.

9. The SFRA2 includes flood data and provides best practice flood modelling analysis to identify the level of flood risk from rivers, sewers and surface water across the Borough. Generally, the SFRA2 appraises:
   - The impact of climate change on flood risk.
   - Flood defence and flood risk management.
   - The possibility of flooding and impact from Canal breaches.
   - The possibility and impact of flooding from Seeswood Pool reservoir.
   - The level of flood risk from surface water flooding.
   - Potential Critical Drainage Areas and the level of flood risk they pose.

Flood Defences in the Borough

10. The following flood defences exist:

Defence	Year Built	Level of Protection	Condition
Flood Relief Channel to protect Nuneaton town centre.	1978	Gives a 1 in 100 year level of protection, although around Sainsbury's and the Museum it is estimated to be 1 in 25 year level of protection in places.	Overall condition is good, with some sections in poor condition.
The Long Shoot defences	2006	Gives a 1 in 100 year level of protection	Overall condition is good.
Channel and Flood Wall, Bedworth	2011	Gives a 1 in 100 year level of protection.	Overall condition is very good.

11. Where it is not possible for all new development to be located in flood zone 1 an assessment of the "actual risk" of flooding is required. An assessment of the "actual risk" of flooding refers to the presence of flood defences and provides a picture of the safety of existing and proposed development.

12. The SFRA2 states that the standard of protection afforded by flood defences is not constant and it is presumed that the required minimum standards for new residential development should be protection against:
    - an annual probability of river flooding of 1% in any year (1 in 100 years).

Flood Risk of Potential Development Areas

13. Analysis of the potential development areas (PDAs) shows that there are no significant risks of flooding in the PDAs. However, there is a risk in Nuneaton Town Centre. Where a risk is posed, the design and layout of development can avoid flood risk areas. Table 3 shows the largest area of flood risk affects 25% of one PDA, compared with the majority of PDAs, where less than 10% is at risk, with some PDAs at no risk of river flooding.

Table 3: Percentage of land in PDAs at risk of flooding

Housing	% of Site at Risk of River Flooding	**Employment**	% of Site at Risk of River Flooding
PDA1	3%	NTC	75%
PDA2	11.8%	Ar/13/08h	1%
PDA3	25%	Ar/13/08i	11%
PDA4	4%	Ar/13/08j	9%
PDA5	7.7%	Ar/1308k	1%
PDA6	15%	Ex/19/08	0%
PDA7	0%	He/01/08	0%
PDA8	0%	P11	0%
PDA9	0%	P27	0%
PDA10	12%	P28	0%
		P03	0%
		P04	25%
		WB/01/08	0%

Canal Flood Risk

14. Canals do not generally pose a direct flood risk. Indeed, canal flooding is such an unlikely occurrence it is considered to be a residual risk (the risks that remains after mitigation measures are in place) from lower probability events such as overtopping and embankment failure.

15. Nonetheless the SFRA2 undertook Breach Point Modelling for PDAs 2 and 3 to give an awareness of what may happen if a breach was to occur. The modelled scenarios show a worst case outcome should a breach occur. They do not, however, assess the probability of failure. As such the SFRA2 states development adjacent to canals will need to consider the residual risk as part of their Flood Risk Assessments and set development at least eight metres away from canals.

Reservoir Flood Risk

16. There is no recorded history of breaching or overtopping of Seeswood reservoir. Warwickshire County Council has ultimate responsibility for the safety of the reservoir. The Environment Agency ensures reservoirs are regularly inspected and essential safety work carried out if required.

17. In the unlikely event of failure of Seeswood Pool, small areas of the following PDAs will be at risk of flooding:
    - PDA5a – the south-west area of the site, adjacent to the un-named tributary
    - PDA5b – a small area in the east of the site, adjacent to the un-named tributary
    - PDA5c – a section of land in the north east
    - AR/13/08j – a small area through the centre of the site

18. The SFRA2 states that these areas within the PDAs should be used for public open space and green infrastructure.

Critical Drainage Areas

19. Critical Drainage Areas (CDAs) are defined "as areas within flood zone 1 which have critical drainage problems and which have been notified to the local planning authority by the Environment Agency".

20. CDAs are sensitive to an increase in the rate of surface water runoff from new development and require specific drainage solutions to help reduce local flood risk. Consequently, these areas would benefit from a Surface Water Management Plan (SWMP) and subsequent drainage strategy. Warwickshire County Council is responsible for producing a SWMP for the County but it should be carried out with support from the Borough Council, the Environment Agency and Severn Trent Water.

21. Nuneaton and Bedworth Borough has six CDAs. Appendix 1 shows a map of the CDAs in Nuneaton and Bedworth.

Table 6: Critical Drainage Areas

Critical Drainage Area	Reason
Nuneaton Centre and West	• Reported sewer and surface water flooding incidences. • SFRA analysis shows significant surface water flooding hotspot. • Properties shown as affected in the DG5 Register.
Nuneaton East	• Reported sewer and surface water flooding incidences. • SFRA analysis shows significant surface water flooding hotspot. • Properties shown as affected in the DG5 Register.
Weddington and Horeston Grange	• SFRA analysis shows significant surface water flooding hotspot. • Properties shown as affected in the DG5 Register.
Bedworth East	• Reported sewer and surface water flooding incidences. • Properties shown as affected in the

	DG5 Register.
Bedworth West, including Bedworth Heath	• Reported sewer and surface water flooding incidences. • SFRA analysis shows significant surface water flooding hotspot. • Properties shown as affected in the DG5 Register.
Bulkington	• Reported sewer and surface water flooding incidences. • SFRA analysis shows significant surface water flooding hotspot. • Properties shown as affected in the DG5 Register.

22. There is a lack of information in on CDAs in relation to the sewer network, such as sewer capacities and drainage directions. Consequently, CDAs identified in the SFRA2 should be refined overtime through a SWMP and drainage strategy.

Sustainable Urban Drainage Systems

23. Sustainable Urban Drainage Systems (SUDS) are management practices which enable surface water to be drained in a way which mimics, as closely as possible, the run-off prior to development. Therefore, where there is new development, SUDS should control surface water to flow at equivalent greenfield rates or better. The suitability of the techniques, however, will be dictated by the development proposal and site conditions.

24. Under the Flood and Water Management Act the SUDS Approval Body will ensure National Standards for sustainable drainage are met, as it is responsible for approving, adopting and maintaining drainage plans.

25. The SFRA2 provides site specific SUDS advice for each potential housing and employment site.

SFRA2 Recommendations

26. The SFRA2 makes the following recommendations:
    - Use the SFRA2 to inform the Borough Plan
    - Developers must refer to the Flood Risk Assessment (FRA) set out in sections 7.3 and 11 of the Report
    - Investigate further flood defence measures as part of the Local Flood Risk Management Strategy (flood storage and functional floodplains etc).
    - Development adjacent to the canals should take account of residual risk from breach or failure and incorporate a buffer zone of at least eight metres.
    - Development downstream of Seeswood Pool should take account of residual risk. Affected areas within the relevant PDAs should be used for public open space.
    - Investigate ownership of critical structures/features and determine whether designation of the structure/feature is needed.

- Warwickshire County Council, the Borough Council, the Environment Agency and Severn Trent Water should work closely to refine the CDAs and identify priorities as part of preparing Surface Water Management Plans.
- SUDS should reduce surface water flows back to equivalent greenfield rates or better.
- The SFRA2 should be used to enhance the Green Infrastructure Plan, particularly in relation to flood storage and functional floodplains.
- The SFRA2 should be periodically updated when new information on flood risk, flood warning or new planning guidance or legislation becomes available.

Water Cycle Study (Halcrow Group Ltd, 2010)

27. The Water Cycle Study provides strategic evidence to determine if future growth and associated development will or will not have a detrimental impact on the environment and whether or not the necessary water infrastructure can be provided in a timely manner to support the required growth.

28. The Study includes a summary of the key findings and recommendations for Nuneaton and Bedworth Borough Council. These are:
    - There should be sufficient developable land outside of flood zones 2 and 3 within the Borough to accommodate the proposed development outside of high flood risk areas.
    - The Borough is predominantly underlain by clay-rich soils which are poorly-drained. As a result it is less likely that infiltration based SUDS will be appropriate to manage surface water runoff from development sites.

29. The Study also made a number of specific to manage surface water:
    - In accordance with the NPPF and the forthcoming flood and water management Bill (and associated national SuDS standards) SuDS are required to be implemented at all scales of development. At the household level there should be a presumption away from connecting property extensions or additional hard standing areas to the sewerage network. The additional run off should be managed at source, where possible, or connected to a watercourse (in agreement with the Environment Agency).
    - Infiltration SuDS should be promoted where practical. Where infiltration SuDS are not applicable surface water should be discharged to a watercourse (in agreement with the Environment Agency) at a rate no greater than greenfield.
    - Surface water should not be connected to the sewerage network, unless there is no practicable alternative. Where surface water is connected to the sewerage network, runoff rate from the development should be controlled to greenfield.
    - Brownfield development should seek to remove surface water connections to the public sewer; however in some dense urban areas it is recognised that this may be difficult to achieve, but should be considered an aspiration for all development.

- Any large development proposals which come forward to strategically plan the drainage provision across a sites(s). Larger surface water drainage features (e.g. attenuation basins) are likely to result in operational and maintenance cost efficiencies.

Water Cycle Study Update Annex (NBBC, 2015)

6. MANAGING FLOOD RISK POLICY JUSTIFICATION

30. Overall, the SFRA1, SFRA2 and the Water Cycle Study indicate that flood risk from fluvial sources is low and there is enough developable land outside flood zones 2 and 3 to accommodate new development.

31. Within the relevant Catchment Flood Management Plans to Nuneaton and Bedworth, it is estimated that properties at risk during a 1% flood event is likely to increase due to urban growth and climate change. Consequently, actions are needed to keep pace with climate change and to reduce flood risk in the short term.

32. The SFRA2 states that areas of flood risk can be used for recreation, amenity and environmental purposes, providing an effective means of flood risk management as well as providing connected green spaces with consequent social and environmental benefits. This will help to build flood resilience into the development site

33. SFRA 1, SFRA 2 and the Water Cycle Study indicate that for a number of locations, surface water flooding has been identified as a problem. This is particularly the case during times of heavy and prolonged rainfall. Future development proposed in locations known to be at risk from surface water flooding should include suitable SUDs mechanisms to reduce surface flows to equivalent greenfield rates or better.

34. The Upper Soar and Upper Anker Catchment Sub-Area is typified with loamy clay soils which impedes drainage and intensifies surface water flooding, which, if not appropriately mitigated, will have adverse impacts for Nuneaton. This could be potentially exacerbated as Nuneaton is near the headwater of its catchment area and is therefore at further risk of rapid run-off. Furthermore, a key message from the Telford, Black Country, Bromsgrove, Kidderminster and Coventry Cluster Catchment Sub-Area is that surface water flooding is a growing problem.

35. Evidence from both SFRAs and consultation responses from the Environment Agency and the Woodland Trust show that environmental stewardship schemes, such as tree planting, reduces water and soil runoff from agricultural land and therefore reduces surface water body and groundwater pollution.

36. The SFRA 1 and SFRA 2 recommend restoring river channels to their natural state and avoiding culverting, as this will also help to improve the ecological and chemical status of surface water bodies. Restoring watercourses to a more

natural state is also a key message of the Upper Soar and Upper Anker Catchment Sub-Area.

37. The Humber River Basin Management Plan also states that physical river modifications are key reasons for failures in the catchment area.

38. The Water Framework Directive imposes tighter restrictions to reverse the decline of surface water bodies and to achieve good overall status by 2027, as well as to ensure there is no deterioration of current groundwater quality.

39. Within the Humber and Severn River Basin Management Plan it is stated that the main reasons for high or rising nitrate concentrations in groundwater is due to pesticides and chemicals associated with mine working.

40. Taking account of the above issues, the **Managing Flood Risk and Water Quality** Policy is proposed:

Managing Flood Risk and Water Quality Policy

Managing Flood Risk
In the first instance, seek to locate development in areas of low flood risk as identified with the Level 2 Strategic Flood Risk Assessment. Where major development is proposed in flood risk areas, a site specific flood risk assessment (FRA) must be included with the planning application to show that the risk both within the site and to sites further downstream is not increased. The FRA will have due regard to the recommendations of the Level 2 SFRA, the Humber and Severn Flood Risk Management Plans and Warwickshire Surface Water Management Plan, particularly in relation to the appropriate use of sustainable urban drainage systems and the impact from climate change.

To support their planning application, developers will identify suitable and competent bodies that will adopt, manage and maintain sustainable urban drainage provision in perpetuity.

Flood Defences
Existing flood defence infrastructure will be protected. Where development compromises the existing flood defence function, the FRA must demonstrate how the risks to the flood defence function will be avoided, mitigated or redeveloped and that any risks both within the site and to sites further downstream will not increase.

Surface Water Run-Off
On sites requiring a FRA, measures to reduce surface water flows back to equivalent greenfield rates or better are required.

Development proposals will have regard to Warwickshire County Council's Surface Water Management Plan and promote land management and tree planting schemes as a way of reducing water and soil run-off into the river network, standing water bodies and groundwater.

Water Quality
Development proposals will protect and improve the quality of water bodies in and adjacent to the Borough and will benefit the river network by restoring the functional floodplain and reinstating a natural meandering river channel where it has previously been lost. In doing so development proposals will have regard to the actions and objectives of the Humber and Severn River Basin District Management Plans, particularly in relation to surface water run-off and improving the quality of rivers and groundwater.

Groundwater Quality
Where source contamination is located on site a groundwater risk assessment demonstrating that the development proposal will not lead to deterioration in groundwater quality and quantity will accompany the planning application.

If a deterioration in groundwater quality cannot be avoided, there will be a presumption against the development proposal.

Policy Delivery Mechanisms

41. The following delivery mechanisms are relevant:
    - Use the Strategic Flood Risk Assessment Level 2 and Warwickshire Surface Water Management Plan to identify sites at least risk of flooding for development in the Borough Plan and other Development Plan Documents.
    - Development of new flood defences and SuDS to allow development to take place.
    - Delivery of projects set out in the Green Infrastructure Plan relating to flood alleviation.
    - Review the Strategic Flood Risk Assessment on a five-yearly basis.
    - Review the Emergency Planning Strategy.

Monitoring

Indicator	Target
The number of planning permissions granted contrary to advice of Environment Agency on grounds of flood risk.	0%
The number of planning permissions granted contrary to advice of Environment Agency on grounds of risk to water quality.	0%
The number of planning permissions granted contrary to advice of	0%

Environment Agency on grounds of risk to groundwater quality	
Number of developments requiring SuDS	100%

APPENDIX 1: Map of Nuneaton and Bedworth's Critical Drainage Areas