Anca Seaton

From: Keith Kondakor
Sent: 16 October 2023 19:09
To: Planning Policy
Subject: Re: Flood alleviation project

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Processed

Please accept this as background evidence for my reg 19 replies.

Keith Kondakor

From: Joanne Pierson [redacted]
Sent: 28 September 2023 11:55
To: Keith Kondakor [redacted]
Subject: Flood alleviation project

Afternoon Councillor Kondakor

Please find attached a timeline and associated documents for the Flood Alleviation Project.

I will send a second email with another single attachment.

If you have any queries, please let me know.

Jo Pierson
Regeneration Monitoring and Evaluation Officer
[redacted]
Follow us: @nbbcouncil

Anca Seaton

From: Jacqueline Padbury
Sent: 28 November 2023 10:37
To: Keith Kondakor
Subject: FW: Flood alleviation project

Councillor Kondakor
Was there meant to be an attachment to this email?

Jacqui Padbury (MA MRTPI)
Principal Planning Policy Officer
[redacted]
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Nuneaton & Bedworth
United to Achieve
WORK LIVE VISIT
BUILDING A BETTER BOROUGH

From: Keith Kondakor [redacted]
Sent: Monday, October 16, 2023 7:09 PM
To: Planning Policy [redacted]
Subject: Re: Flood alleviation project

Please accept this as background evidence for my reg 19 replies.

Keith Kondakor

From: Joanne Pierson [redacted]
Sent: 28 September 2023 11:55
To: Keith Kondakor [redacted]
Subject: Flood alleviation project

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Jo Pierson
Regeneration Monitoring and Evaluation Officer
[redacted]
Follow us: @nbbcouncil

Anca Seaton

From: Keith Kondakor
Sent: 28 November 2023 13:26
To: Jacqueline Padbury
Subject: Fw: Flood alleviation project
Attachments: 5 - R07_1 - Change Request Form - FHSF Flood Project(2).docx; timeline - flood alleviation.xlsx; 1 - BriefingNote_baseline_model_Dec2021_FINAL.pdf; 3 - Nuneaton Economics and Options Assessment 2022-05-27.pdf; 4 - NBBC-WCC Flood Workshop 12072022 - Meeting Notes - FINAL.pdf; 6 - BriefingNote_Nuneaton_FAS__For_Members_Feb2023.pdf

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From: Joanne Pierson [redacted]
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I will send a second email with another single attachment.

If you have any queries, please let me know.

Jo Pierson
Regeneration Monitoring and Evaluation Officer
[redacted]
Follow us: @nbbcouncil

Briefing Note to partners (Dec 2021)
Updated flood modelling - Bar Pool Brook, Nuneaton

This briefing note summarises progress with the Bar Pool Brook catchment flood modelling and how the baseline data, now available, should be used for future development sites in Nuneaton.

What is the updated baseline flood model for the Bar Pool Brook?

WCC Flood Risk Management team have been working with consultants AECOM to improve the existing flood mapping across Nuneaton from the Bar Pool Brook and its tributaries.

The baseline flood model represents an updated picture of the 'current day' flood risk to Nuneaton, without the benefit of any future flood alleviation scheme within the Bar Pool Brook catchment.

The model was submitted to the Environment Agency in November 2021 for a review to ensure it meets their modelling standards, expected completion February 2022.

Why is the flood model being updated?

The existing Environment Agency flood mapping is based on coarse-scale national mapping (known as JFLOW) and is not suitable for use in developing a flood alleviation scheme.

The existing flood mapping is shown below in Figure 1, and includes an annotation showing the Bar Pool Brook flood extent.

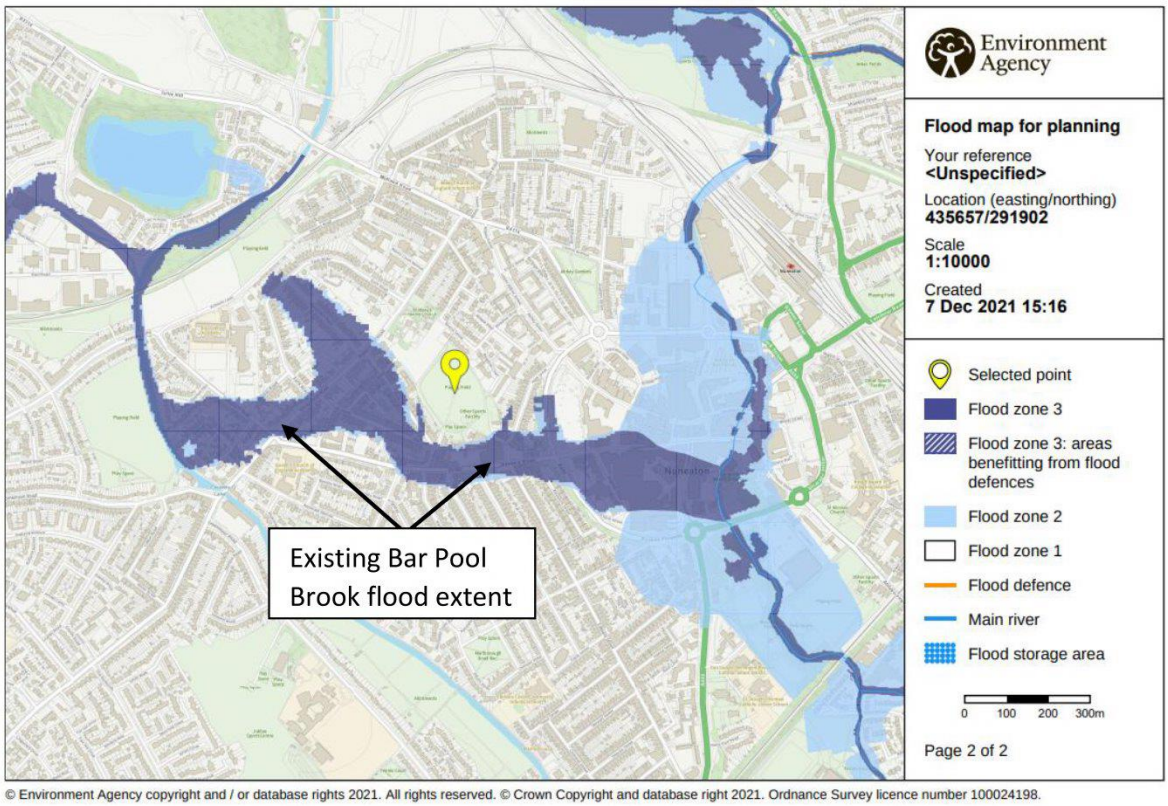

Figure 1 – EA Flood Map for Planning

The updated model will enable WCC to better understand the flood risks from the Bar Pool Brook and use it to develop a flood alleviation scheme within the catchment for the benefit of Nuneaton.

This has involved the development of a detailed 1d-2d hydraulic model for the entire Bar Pool Brook and its tributaries, which includes the complex interactions with the Coventry Canal, Severn Trent Water network and a significant amount of survey work to reflect channel and floodplain capacities and structures.

What do the updated flood extents look like?

Figure 2 below shows the updated flood extents across Nuneaton from the baseline model for the 1% Annual Exceedance Probability (AEP) event and 0.1% AEP event. These correlate to the definitions of Flood Zone 3 and Flood Zone 2 respectively.

Compared with the current coarse-scale EA mapping, the updated modelling shows that some areas are at lower flood risk and others at higher flood risk.

The model was submitted to the Environment Agency in November 2021 for a review to ensure it meets their modelling standards, expected completion February 2022.

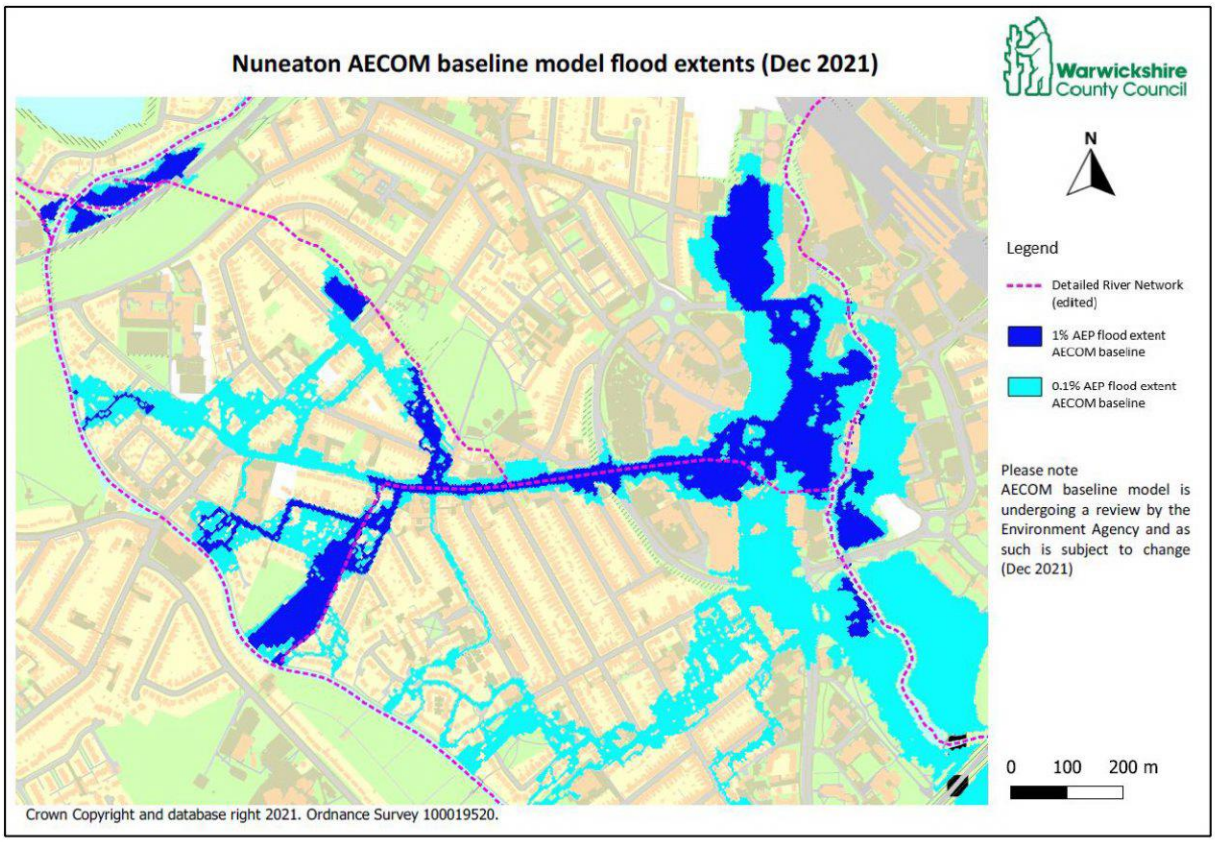

Figure 2 – WCC updated baseline flood extents

How should development sites appraise their flood risk?

The Environment Agency have confirmed with WCC that the updated baseline flood model (Figure 2) is considered to give more accurate flood risk information than the existing EA Flood Map for Planning (Figure 1). As such, the updated baseline model should be used preferentially in site-specific Flood Risk Assessments to understand flood depths, floodplain compensation requirements, finished floor levels etc.

In light of this, we advise that all development sites progressing over the next 2-3 years obtain copies of our baseline flood model so that the flood risk to those sites is appraised using the best available information.

Will the EA Flood Map for Planning be updated with the new modelling?

WCC have discussed with the Environment Agency whether the EA Flood Map for Planning should be updated with the baseline model once the EA have reviewed and approved it.

It is noted that the baseline flood extents will be revised again once the flood alleviation scheme is built. To avoid areas moving into and out of flood risk areas over a relatively short period of time, the decision has been made to update the Flood Map for Planning at the end of the project (once the scheme is built).

Once the flood scheme has been built out, the Flood Map for Planning will be updated to reflect the flood risk benefits of the scheme. An element of flood risk may remain post-scheme (for example from the River Anker and from extreme flood events such as the 1 in 1000 year event). Such details will become available later in the project.

Where can I go for further information?

To obtain copies of the baseline flood model, or for any other queries on the modelling work and flood alleviation scheme, please get in touch with Dan Lamb, Senior Flood Risk Management Engineer, on [redacted]

Flood Alleviation Project
Lead by Warwickshire County Council

Note: blue text below from WCC

July 2020	Bid submitted by NBBC to FHSF for a package of projects (Flood alleviation was one of those projects)
December 2020	NBBC notified they had been succesful.
	Consultants AECOM undertook a feasibility study for WCC for a flood alleviation scheme on the Bar Pool Brook catchment in Nuneaton. The aims were to reduce or remove flood risk from the town centre.
December 2021	AECOM extensively surveyed and re-modelled the watercourse catchment, to provide an updated baseline model, which was available for TN projects by the end of 2021 "**see1 - briefing note baseline model Dec 2021 FINAL"**
April 2022	The baseline model was signed off in spring 2022 and AECOM produced the baseline modelling report **"see 2 GDN Baseline Modelling Final Appendices ForIssue280422"**
May 2022	Monitoring & Evaluation doc submitted to Govenment - "The project is at the end of the feasibility stage and facing a large funding gap. A meeting on 16/06/22 with WCC and NBBC should give direction on whether the funding gap can be overcome and the proposed scheme is desirable or whether the project needs to be re-scoped. Due to the amount of pre-construction activities, the date for start of construction is currently May 2024."
	Work began on option selection for the flood scheme. TN Board and wider partners kept updated throughout.
27/05/2022	CPSB - project progress report - FHSF granted, options appraisal and cost estimate expected June 2022. CPSB - mins - lack of progress by WCC
May / June 2022	AECOM Economics and Options assessment and project cost estimates completed May/June 2022 giving c. £.9.5m construction cost.
	The above concluded that the only viable option that reduced flood risk within the town centre was a reservoir-scale flood storage area in Whittleford Park – **"see 3 - AECOM Economics and Options Assessment report"**
12/07/2023	A workshop was held with reps from WCC and NBBC on 12/7/22 to discuss this and agree whether the option was progressed. **"See 4 - NBBC-WCC flood workshop 12072022 - Meeting Notes - FINAL"**, concluding the reservoir was not desirable or affordable.
03/08/2022	CPSB - mins - Project to be closed, and plan B scheme to be added as a new project.
28/09/2022	Project progress rep - WCC procuring consultants to carry out an economic assessment and BCR on the updated proposal.
10/10/2022	CPSB - dashboard - FHSF granted, options appraisal and cost estimate complete. Cost estimate shows c.£7M funding gap. Change request submitted proposing this version of the project is closed and a smaller one is developed. CPSB - mins - Change request form submitted and approval given
Dec-22	Monitoring & Evaluation doc - "A modelling and feasibility assessment concluded that a scheme to remove flood risk areas from the town centre is too costly and undesirable. Scope has been re-worked to a Property Flood Resilience scheme and an economic and technical feasibility assessment are underway, expected December 2022, which will inform whether there is a project to progress."

18/01/2023	CPSB - a change request form **"see 5 - R07_1 - Change request form"** was submitted to cancel the project due to the inability to deliver it - approval given. Form to be submitted to Government to transfer monies from flood alleviation to Bridge to Living project, and subject to approval the flood alleviation project closed.
Feb 2023	WCC then explored an alternative proposal for Property Flood Resilience, but concluded it was unviable and that the project is therefore not in a position to use the FHSF funding – **"see 6 - briefing note Nuneaton FAS for Members - Feb2023"** shared with TN Members.
	WCC discussed with Tom Hobbs (TN Programme Manager, NBBC) throughout. Tom advised he will explore re-allocating the funds to BTL.
Mar 2023	The AECOM baseline flood model completed its Environment Agency technical review in March 2023. It is now on their list of updates for the external-facing Flood Map for Planning – completion anticipated around November 2023.
19/04/2023	CPSB - mins - flood alleviation project closure report to be completed. SJ to check with DD to see if closure was agreed with TDB.
Jun-23	Project Adjustment Report submitted to DLUHC 13 June 2023 to remove flood alleviation project. Reason - rising cost inflation means the project can no longer be delivered within the FHSF progrmame. Funding for this project to be utilised in the Bridge to Living project.
18/07/2023	CPSB - mins - flood alleviation project closure report outstanding. Confirmed TDB had been informed of the project closure.
07/09/2023	Email from DLUHC giving approval to remove flood alleviation project and move the funds to Bridge to Living project
	Flood Alleviation closure report to be submitted to CPSB on 11 October 2023

Growth Deal Nuneaton

Economic and Options Assessment

Warwickshire County Council

Project number: 60561949

May 2022

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
00	27/05/2022	Initial draft			

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Figures

Tables

1. Baseline Damage Assessment

A baseline damage assessment has been carried out as part of the Outline Business Case (OBC), to determine the baseline flood damages associated with the Nuneaton Growth Deal. This assessment has identified the value of damages over the 50 year appraisal period, to align with the expected scheme design life. Following this baseline assessment, the damages have been compared to the damages associated with the preferred option as part of the option appraisal to calculate the benefits.

1.1 Methodology

To facilitate the economic assessment, the damages have been identified for the 50 year appraisal period in four time periods: 2022 to 2030, 2030 to 2037, 2037 to 2070 and 2037 to 2072. This is in line with the latest Environment Agency guidance for climate change allowances[1].

The baseline scenario represents a 'Do Minimum', which assumes business as usual through maintenance of gullies and sewers and well as the removal of any debris as required. A 'Do Minimum' scenario varies from a 'Do Nothing', which assumes no intervention or maintenance. This scenario was selected as it is more reflective of the current situation, and there is little difference between the two scenarios and damages effectively the same.

1.1.1 Supporting hydraulic modelling

To determine the flood depths to support the assessment, a range of return periods were modelled. Hydraulic modelling was undertaken to stablish a new flood risk baseline in Nuneaton. To establish this baseline, 1D/2D hydraulic modelling was undertaken supported by new hydrological flow estimates. This built upon hydraulic modelling completed by Capita AECOM in 2016 on behalf of the Environment Agency. The study modelled and mapped the Wem Brook, the River Anker and River Anker Flood Relief Channel (FRC).

As part of the model update the legacy 2016 modelling was extended to include the following key watercourses identified as contributing to fluvial flood risk in central Nuneaton :

- Bar Pool Brook, extending from its source to the confluence with the River Anker;
- Griff Brook, extending from Bermuda just upstream of Walsingham Drive to the confluence with the Wem Brook;
- Galley Brook, extending from Galley Common just upstream of Hickman Road to the confluence with the Bar Pool Brook;
- Hockley Brook, including a 400m reach to the confluence with the Bar Pool Brook; and,
- Coventry Canal to ensure its interaction with the Bar Pool Brook is correctly represented

This hydraulic modelling represents a 'Do Minimum' scenario, which assumes business as usual. For further information on the return periods and modelling approach, refer to Baseline Hydraulic Modelling Report[2] .

Flood mapping results (depth and extent) for the following return periods were included in the economic assessment:

- 50% AEP event (1:2 year);
- 5% AEP event (1:20 year);
- 2% AEP event (1:50 year);
- 1% AEP event (1:100 year) and,
- 0.5% AEP event (1:200 year).

[1] Environment Agency (2022) Flood and coastal risk projects, schemes and strategies: climate change allowances. Available from: https://www.gov.uk/guidance/flood-and-coastal-risk-projects-schemes-and-strategies-climate-change-allowances [Accessed 26 May 2022]
[2] Baseline Hydraulic Modelling Report (AECOM) 2022

Flood mapping for each return period was used for 2022, 2030, 2039 and 2072. To determine the flood depths and extents for 2030, 2037 and 2070, climate change projections (UKCP18) were used. A climate change allowance of 10% on peak river flow was applied to 2030, 11% to 2037 and 22% to 2070. This is considered to be a conservative approach in line with the latest Environment Agency FCERM guidance for the Humber Catchment. The maximum depth grids (5x5m resolution) from the flood model results were output into GIS to facilitate the inspection of flood depths for assets within the study area.

Further modelling was then carried out for each of the preferred option, to determine the option benefits. Sensitivity testing has been carried out in Section 6 to ensure the results are robust, such as sensitivity testing of property threshold levels, option costs and option benefits.

1.1.2 Identifying flood depths

To identify individual properties at risk, an address point dataset (National Receptor Database, 2014) was used. The National Receptor Database (NRD) includes the property address, post code, property type (e.g. detached residential, semi-detached residential, factory, office, shop etc.) and property coordinates for all assets within the study area. Flood depths for each individual property were obtained in GIS by undertaking a point inspection to determine the flood depth for each return period that intercepts the NRD property point.

1.1.3 Data filtering

The NRD database contains a number of properties and assets which cannot be included in the valuation of the baseline damages. Once the flood depths for each property had been assigned, the database was checked to remove duplicate address points. Upper floor properties were removed and not counted in flooding damages.

Assets with no NRD classification description ('Awaiting classification' and 'Blank') were excluded from the analysis as were the following classifications with negligible susceptibility to flooding as per the guidance in the MCM Technical Note (2016)[3]:

- Advertising Hoarding
- Bus Shelter
- Caravan
- CCTV
- Development
- Development Site
- Hopper / Silo / Cistern / Tank
- Mausoleum / Tomb / Grave
- Postal Box
- Property Shell
- Street Record
- Static Water
- Unused Land
- Utility

The 999 classification represents properties where the land use is unknown. A similar approach to that recommended in MCM Technical Note (2016)[4] for reclassifying MCM 999 properties was adopted whereby the non-residential sector average damages were applied. No basement areas have been allowed for in the economic analysis. This was informed by a high level inspection of the area in Google Street View which suggested that the majority of properties do not have basements.

1.1.4 Property thresholds

For both residential and non-residential properties, a threshold value of 0.15m was applied. An initial Google Street View inspection has been carried out to estimate the typical threshold and validate this assumption.

1.1.5 Residential flood damages

Flood damages were obtained from the Multi-Coloured Manual (MCM, 2021). The value of flood damage was based on the residential property type (detached, semi-detached, terrace, flat) and the depth of flooding for each flood scenario. Damage values for 'Short duration, fluvial, major flooding' were adopted as this is a flashy catchment and were then adjusted by a factor of 1.056 to allow for emergency costs (as recommended in the MCM,

[3] Chatterton, J.B. (2016) National Receptor Dataset: Property codes with prefix "9". Version 1, May 2016 © Flood Hazard Research Centre, Middlesex University
[4] Chatterton, J.B. (2016) National Receptor Dataset: Property codes with prefix "9". Version 1, May 2016 © Flood Hazard Research Centre, Middlesex University

2021) and the latest Consumer Price Index (CPI) to account for inflation. The direct flood damages values for different depths are summarised in Table 1-1.

1.1.6 Non-residential flood damages

Non-residential flood damages were also obtained from the MCM (2021). The property damages are based on the non-residential property type, the footprint area (m^2) and the depth of flooding for each of the modelled return periods. For NRD 999 properties, the property damages are based on the 'Non-Residential Property Sector Average'. Damage values for 'fluvial, short duration major flood' were used and adjusted to account for the latest Consumer Price Index (CPI) to account for inflation. The direct flood damages values for different depths are summarised in Table 1-2.

Table 1-1: Flood damages for residential properties adopted from the MCM (2021). Values adjusted to account for emergency uplift and latest available CPI

Short Duration, fluvial, major flood. Adopted from MCM (2021) (£)																	
MCM Code	Property Type	Component	Depth (m)														
			-0.3	0	0.05	0.1	0.2	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3
11	Detached	Total Damage	2748	2748	10994	17361	29114	36352	43802	49347	54543	59926	66278	71995	77100	87145	91544
12	Semi-detached	Total Damage	3650	3650	9043	12682	19202	22699	26791	29300	32610	36217	40355	44177	48754	56924	60079
13	Terrace	Total Damage	3321	3321	8200	11576	17404	20673	24766	27181	30132	33025	36466	39641	43246	51131	53697
14	Bungalow	Total Damage	2651	2651	11369	17257	25737	31181	37537	42334	47658	53480	60215	66087	71988	82900	87006
15	Flat	Total Damage	2554	2554	7889	11732	17905	21343	25890	28640	31309	33879	36869	39368	41329	47913	49759

Table 1-2: Flood damages for non-residential properties from the MCM (2021). Values adjusted to account for latest available CPI

Short Duration, warning, fluvial, no cellar. MCM (2021) (£)														
MCM Code	Property Type	Depth (m)												
		0	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3
2	Retail	75	357	536	713	905	1042	1174	1312	1531	1668	1777	1823	1891
3	Offices	81	383	563	696	850	949	1062	1200	1409	1544	1666	1718	1786
4	Warehouses	24	337	580	754	917	1058	1154	1272	1400	1425	1467	1482	1520
6	Public buildings	51	252	346	420	511	573	652	739	865	962	1025	1049	1079
8	Industry	15	86	130	168	213	248	282	321	381	418	458	484	517
51	Leisure	357	912	1066	1179	1319	1421	1546	1677	1867	2017	2131	2181	2243
521	Playing Field	5	11	25	27	29	30	31	32	34	35	37	38	38
523	Sports Centre	47	212	299	355	418	453	525	609	717	801	849	863	882
525	Sports Stadium	10	49	76	94	118	132	152	168	200	216	229	235	241
526	Marina	22	63	82	112	136	156	173	193	226	257	286	305	331
960	Substation	40	1388	1851	2298	3569	4419	5684	6139	8632	8662	8689	8708	8718
	NRP Sector Average	58	415	584	738	1008	1191	1431	1575	2024	2115	2190	2224	2270

1.1.7 Write-off and capping damages

Property write off

It is stated in FCERM-AG that properties should be assumed written-off once flooded by an event of 1:3 year return period (33% AEP) or less, as the property would no longer be habitable or functional. Once 'written off' the present day value of the property is taken as an economic damage, but it can no longer accrue flood damages after that point.

The numerical model simulations undertaken for the study included a 1:2 year event (50% AEP). This event is a lower return period that the 1:3 year event and was used in the assessment to determine property write off.

Property capping

FCERM-AG also states that the total PV flood damages for a property over the duration of the appraisal period must not exceed the property market value. The cumulative damages were monitored for each property and once they exceeded the property value, further flood damages were capped and the property did not accrue any more damages.

Property values

The value of each property was required to incorporate write off and capping within the economic assessment. For residential properties, average house sale prices for the Warwickshire region were obtained from The HM Land Registry Price Paid Dataset. The values were averaged for residential property type (detached, semi, terraced, flat) and were used in the assessment. This dataset was last updated in January 2022.

The commercial property values were valued on the rateable value for their business type (provided by the valuation office). Average values for retail, workshops, industry, warehouses and offices between £45/m^2 and £190/m^2 were estimated and then multiplied by the building floor space to estimate the rateable value of the business. In accordance with FCERM-AG, the rateable values were then divided by the business yield (6%) to provide an estimate of the market value for flood damage and capping purposes.

1.1.8 Discount rate

Discounting is a technique used to compare benefits (and costs) that occur at different points in time over the appraisal period (i.e. the next 50 years). Standard discount rates have been used to convert all cash damages to PV. This enables the whole life damages, benefits and costs of the options to be compared and also leads to a realistic assessment of the cost implications in today's terms. According to FCERM-AG, the following variable discount rates have been used within the economic appraisal; 3.5% for the years 0 to 30 and 3% for the years 31 to 75 (HM Treasury Green Book, 2020).

The annual average (non-discounted, cash) damages were discounted over the appraisal period to calculate the discounted whole life Do Nothing PV damages.

As an example of discounting applied to the economics assessment, if a property values at £100k (in cash terms) was to be written off in year 10 (i.e. towards the start of the appraisal period) the discount factor applied in year 10 is 0.71 so therefore the economic damage associated with loss of the property (in PV terms) would be £71k. If the property was instead written off in year 30 (towards the end of the appraisal period), the discount applied in year 30 is 0.36 so therefore the economic damage would be £36k (in PV terms).

For Loss of Life and Mental Health damages, a different discount rate has been applied using recent EA guidance based on the revised Green Book (published in 2018). The following discount rates have been used: 1.5% for the years 0 to 30, 1.286% for the years 31 to 50.

The annual average (non-discounted, cash) damages for Loss of Life and Mental Health were discounted over the appraisal period to calculate the discounted whole life Do Nothing PV damages.

1.1.9 Indirect flood damages

In addition to the direct flood damages to residential and non-residential properties, indirect flood losses have been considered. Indirect flood losses reflect deviations from the economic theory that suggests in a perfectly competitive world, all sales or production would simply transfer to a competitor with no financial loss to the nation as a whole. In reality, deviations from the competitive model exist and trade cannot simply be transferred, leading to indirect

flood damages. The areas of indirect flood damages that have been included in the assessment are discussed further below.

Intangible damages

Intangible damages associated with flooding to social health impacts, loss of personal items, disruption to the community etc. were included in the assessment at a rate of £250 per residential property (MCM, 2021). Intangible health damages / benefits are not applicable to non-residential properties.

Damages to vehicles

Flood damage to vehicles was considered at a rate of £5,600 per vehicle (MCM, 2021). For the Do Minimum scenario, this damage was applied to 42% of residential properties at risk of flooding in accordance with the MCM guidance. Vehicle damages are not applicable to non-residential properties.

Evacuation / temporary accommodation

Damages associated with the costs of evacuation / temporary accommodation after flood events have been included. These are based on evacuation costs provided in the MCM (2021) which estimate temporary accommodation and alternative accommodation costs for each residential property at £1,304 and £3,731 respectively. At the strategic scale the distribution of properties requiring temporary or longer term accommodation is unknown there it has assumed that 50% of the residential properties affected by flooding will require temporary accommodation, and 50% will require alternative accommodation. Evacuation damages are not applicable to non-residential properties.

Mental health damages

The costs of flooding associated with mental health have been assessed according to recent the Environment Agency guidance[5]. These damages are calculated per adult per flood event, dependent on the depth of flooding. The average depth of flooding for each return period varies between 0.1 and 0.3 metres, therefore a conservative depth of 0-0.3 metres has been assumed giving damages of £1,878 per adult per flood event. The average number of adults per property is 1.85, therefore the total damage per residential property per flood event is £3,475.

Loss of life

The indirect damages associated with potential loss of life from a flood event have been estimated by following the Defra Flood and Coastal Defence appraisal guidance; Social Appraisal, Supplementary Notice to Operating Authorities – Assessing and Valuing the Risk to Life from Flooding for the Use in Appraisal of Risk Management Measures (2008).

By utilising this guidance and following the 'Risks to people' method, the loss of life (£) per magnitude of flood event was estimated. This calculation was based upon a number of variables for the appraisal area that included the flood hazard rating (variables include the depth and flow of water, and the debris factor), the area vulnerability rating (variables include a flood warning system, speed of flood onset and the nature of the area), and the people vulnerability rating (age of population, health of population). The loss of life (£) for each magnitude of flood event was then factored by the probability of the flood event occurring to determine an annual damage per year associated with loss of life.

[5] Environment Agency (2020) Mental health costs of flooding and erosion. Available from: https://www.gov.uk/government/publications/partnership-funding-supporting-documents/mental-health-costs-of-flooding-and-erosion [Accessed 25 August 2021]

1.2 Baseline Damages

The baseline damages were established for the appraisal period between years 0-50.

1.2.1 Properties at risk

The number of properties expected to be at risk from flooding for a range of return period events under the Do Minimum scenario is presented in Table 1-3 below.

Table 1-3: Total number of properties at risk under the Do Minimum scenario, assuming a property threshold of 0.3m for residential and non-residential properties

Year	Return period event	Residential properties at risk	Non-Residential properties at risk	Total properties at risk of flooding
2022	50% AEP	0	0	0
	5% AEP	6	40	46
	2% AEP	10	77	87
	1% AEP	15	97	112
	0.5% AEP	35	130	165
2030	50% AEP	0	0	0
	5% AEP	8	56	64
	2% AEP	15	100	115
	1% AEP	23	112	135
	0.5% AEP	48	163	211
2039	50% AEP	0	0	0
	5% AEP	8	59	67
	2% AEP	15	101	116
	1% AEP	23	113	136
	0.5% AEP	50	169	219
2072	50% AEP	0	0	0
	5% AEP	12	90	112
	2% AEP	23	112	135
	1% AEP	37	138	175
	0.5% AEP	90	200	290

1.2.2 Damages

The baseline damages for the appraisal period are presented below in Table 1-4 below. In the table, 'Cash' damages refer to the undiscounted damages (presented in today's cash terms) whereas the 'PV' damages are those which include discounting through time. The PV damages are those which are adopted in the benefit cost ratio and funding assessment.

Table 1-4: Total Do Minimum damages

Period	Do Minimum Cash Damages (£k)	Do Minimum PV Damages (£k)
Years 0-50	38,763	17,778

2. Options Assessment

2.1 Longlist Options

A long list of options was developed by WCC (Warwickshire County Council), the options are shown in Figure 2-1. Each option was assessed using a multicriteria analysis with the criteria as follows:

- Flood Risk
- Technical
- Capital Cost
- Scheme Benefits
- Stakeholders
- Environment
- Health and Safety

Following this, each option was given a total score a subsequent RAG status, the full scoring can be seen in 2-1. Wider discussion on the options can be seen in the table in Appendix A.

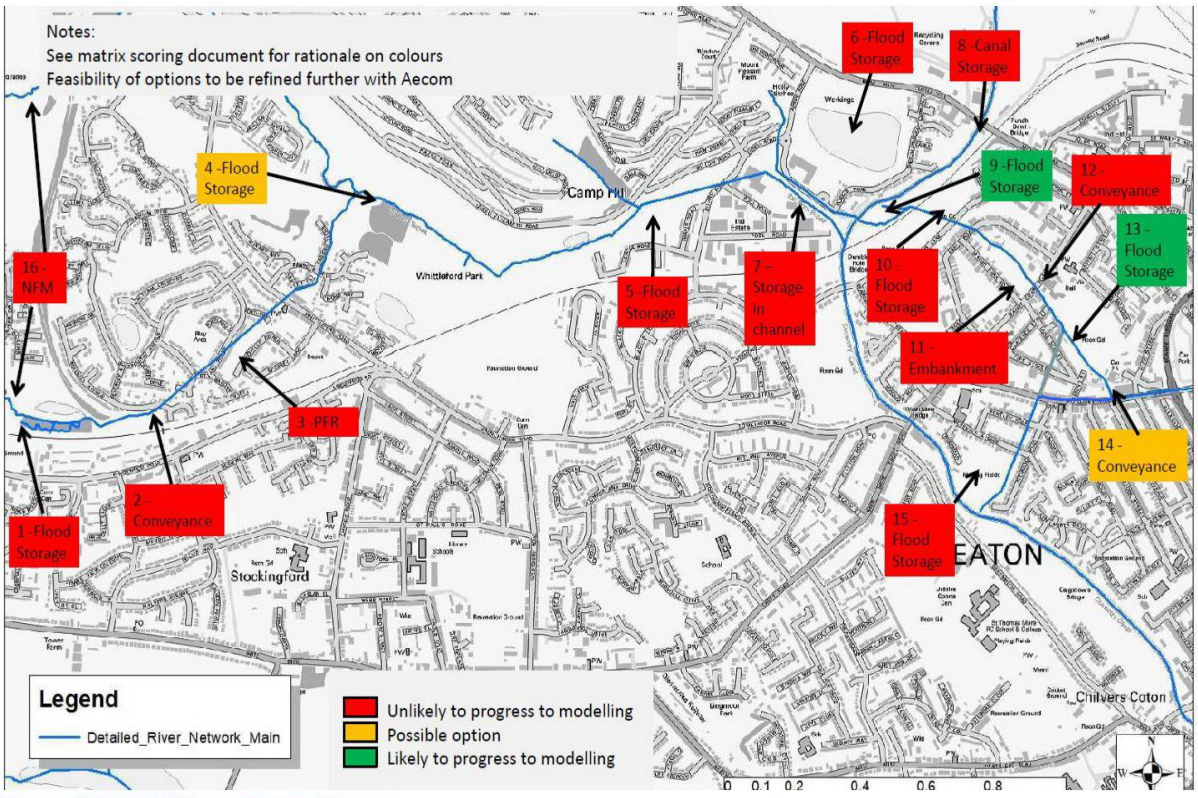


Figure 2-1: WCC Longlist Options

Table 2-1: Long List MCA

ID	Option Name	Flood Cell	Option Category	Option Description	Location	Key Opportunities	Key Constraints	MCA Evaluation Summary							Total Score	RAG Status
								Flood Risk	Technical	Capital costs	Scheme benefits	Stakeholders	Environment	Health & Safety		
1	Whytell Pool Flood Storage	Beverley Avenue	Flood Storage	Construction of a flood storage area with an impounding structure and spillway on the Whyttle Brook in Whyttle Pool area	Whytell Pond & Meadows	Open space upstream of the existing Whytell Pool to create an additional flood storage area to attentuate flows and prevent surcharging at the Beverley Avenue culvert. Access is achievable via Campbell Close. Baseline shows that the area immediately downstream only floods in 100+CC, therefore option unlikely to attract enough FDGIA to proceed.	Situated within a nature reserve and Whytell Pool is used frequently for fishing and by local residents. Modelling of this option is needed in order to confirm the scale of flood storage required and therefore whether the economics would stack up. Planning permission and consents required.	-2	1	-2	-1	0	1	-1	-4	Unlikely
2	Beverley Avenue Conveyance	Beverley Avenue	Conveyance	Increasing embankment crest level & width alongside Beverley Avenue and increasing conveyance by modifying the head wall structure	Beverley Avenue	If existing embankment can be increased and minimal impact on services then capital costs may not be too expensive. Access acheivable via the adjacent highway and space for a compound site. Baseline shows that the area immediately downstream only floods in 100+CC, therefore option unlikely to attract enough FDGIA to proceed.	Modelling is required to confirm whether this option is technically viable to prevent flooding. Utility search needs to be carried out to understand any impacts on services and investigation into the condition of the embankment to see whether crest height and width can be increased	-2	0	-1	-1	0	0	0	-4	Unlikely
3	PFR	Beverley Avenue	PFR	Installation of PFR measures to properties at risk on Beverley Avenue, Barons Croft and Knowles Avenue. Measures include flood doors, sump pumps, non-return valves and waterproofing	Beverley Avenue, Barons Croft, Knowles Avenue	PFR could be delivered to the individual homes which are a mixture of detached and semi-detached. Area is not within a conservation area nor are any of the properties listed	Surveys required to determine bespoke products and needs. Properties need to be within Very Significant risk band to qualify for FDGiA. Located within the Trent catchment so Local Levy is capped at £7,500 per property. Baseline shows that the area immediately downstream only floods in 100+CC, therefore option unlikely to attract enough FDGIA to proceed.	-2	1	0	-1	-1	0	0	-3	Unlikely
4	Whittleford Park Flood Storage	Bar Pool Brook	Flood Storage	Construction of a flood storage area upstream in Whittleford Park with off-take weir, control structure and embankments	Whittleford Park	Open area where there are existing ponds so should also be suitable to flood storage. Land owned by Nun & Bed Borough Council which could be contribution in kind. Access via Queen Elizabeth Rd and space for a site compound	Located near the top of the catchment and flood risk is a long way downstream so may not have any benefits. Could fall under the Reservoir Act as cascading ponds. Planning permission and consents required. May be an option to consider if the volumes of flood storage required cannot be met elsewhere.	0	2	-2	-1	0	1	-1	-1	Possible
5	Willow Road Flood Storage	Bar Pool Brook	Flood Storage	Construction of a flood storage area in the open fields adjacent to Willow Road	Willow Road	Open space downstream of existing ponds. Land owned by Nun & Bedworth Borough Council. Access via Willow Road and plenty of space for a compound. Located further downstream so could attenuate flows on Bar Pool Brook before entering the canal	Located within a historic landfill site and therefore not suitable for a flood storage area	1	-2	-2	1	1	-2	-2	-5	Unlikely
6	Quarry Flood Storage	Bar Pool Brook	Flood Storage	A connection from the Bar Pool Brook to the Quarry via a culvert underneath Ballin Road to attenuate water within the disused quarry	Midland Quarry	Vast quarry with huge capacity for water discharge located in close proximity to Bar Pool Brook just upstream of the canal	Techincally very challenging to pipe connection from Bar Pool Brook to the quarry and no way of discharging water from the quarry. Health and safety risks during construction phase	1	-2	-2	1	-1	0	-2	-5	Unlikely

ID	Option Name	Flood Cell	Option Category	Option Description	Location	Key Opportunities	Key Constraints	MCA Evaluation Summary							Total Score	RAG Status
								Flood Risk	Technical	Capital costs	Scheme benefits	Stakeholders	Environment	Health & Safety		
7	Ballin Road Channel Storage	Bar Pool Brook	Channel Storage	Putting a control structure within the channel of the Bar Pool Brook to store more water within the channel before reaching the canal	Bar Pool Brook adjacent to Ballin Road	Steep sided banks and a length of channel of approximately 230m mean that additional capacity within the channel could deliver flood risk benefits downstream without complexity of using the canal to take additional flow	No access to the channel, steep sided banks and currently fenced off. Water voles identified in the area.	1	-1	0	0	-1	-1	-1	-3	Unlikely
8	Coventry Canal Storage	Bar Pool Brook	Flood Storage	Utilising the Coventry Canal for additional storage by modifying freeboard levels and overflow weirs accordingly	Coventry Canal	45 mile pound length and resonable level of freeboard means that canal is thought to have some capacity for additional flows. The canal is already taking estimated 75% of flow during flood event. Concerns regarding managing uncertainties in the hydraulic connectivity of the canal and associated liabilities should an issue arise, has led this option to be deemed unlikely.	Pound length includes 14 overflow weirs which are unique in arrangement and all discharge water to specific locations within Nuneaton. Lack of data means that this is not well understood within the model. Surface water discharge consent and third-party works consent required.	0	-2	-1	1	0	0	-1	-3	Unlikely
9	Between Canal and Railway Storage	Bar Pool Brook	Flood Storage	Construction of a flood storage area within the parcel of land downstream of the canal and upstream of the railway line. Includes construction of embankments, control structure and spillway	Area between the canal and the railway line	Open area where water could be stored to attenuate flows from the Bar Pool Brook and the overflow from the weir which could deliver benefits to downstream areas of Manor Court Road, Queens Road and the town centre. One of few locations downstream of the canal.	Approximately 5,000m² of land available where water could be stored. Poor access due to small underpass. Access via canal only alternative. Planning permission and consents required. Network rail and Canal and River Trust are stakeholders. Remote underused area, so potential for improved area for public access. No protected species found in recent surveys.	1	-1	0	1	0	2	-1	2	Likely
10	Vernons Lane Flood Storage	Bar Pool Brook	Flood Storage	Daylighting the Bar Pool Brook and creating an online flood storage area with concrete impounding structure and spillway within the fields adjacent to Vernons Lane	Vernons Lane	Large open area downstream of the canal and before watercourse runs through heavily urbanised area with limited space for works. Land is owned by Nun & Bedworth Borough Council so could be contribution in kind. Flood Storage in this area could benefit Manor Court Road, Queens Road and the town centre	This location is an historic landfill site and therefore not suitable for flood storage.	2	-2	-2	1	0	-2	-2	-5	Unlikely
11	Manor Court Embankment	Bar Pool Brook	Embankment	Construction of a flood embankment along the boundary between Manor Court and the rear gardens of Manor Park Road	Manor Court	Opportunity to construct a linear structure to prevent the mechanism of flood risk to the town centre. Would reduce flood risk to Manor Court Road, Queens Road and the town centre	The land is currently owned by Manor Court Residential Home and is used by residents. Located within proximity to a scheduled monument. Land purchase, compensation and planning permission required. Issue of who would maintain the embankment. Updated baseline no longer shows this area as a flood mechanism for downstream flood risk in events up to the 1000yr, and therefore ruled out as a scheme option.	-2	0	-1	2	-1	-1	-1	-4	Unlikely
12	Manor Court Road Conveyance	Bar Pool Brook	Conveyance	Replacing the existing culvert underneath Manor Court Road with a large diameter culvert to increase conveyance of the Bar Pool Brook and reduce volume of water backing up and flowing	Manor Court Road	Main mechanism of flood risk from initial model outputs is from the Manor Court Road culvert and ends up flooding all the way into the town centre. If this option works techincally then the scheme benefits it would deliver would be significant.	Likely impacts on services adding to stakeholders and anticipated capital costs and disruption. Modelling required to determine impact on flood risk. Updated baseline no longer shows this area as a flood mechanism for downstream flood risk in events up to the 1000yr, and therefore ruled out as a scheme option.	-2	-2	-2	2	-1	0	-1	-6	Unlikely

ID	Option Name	Flood Cell	Option Category	Option Description	Location	Key Opportunities	Key Constraints	MCA Evaluation Summary							Total Score	RAG Status
								Flood Risk	Technical	Capital costs	Scheme benefits	Stakeholders	Environment	Health & Safety		
				onto the Manor Park Road highway												
13	Nuneaton Recreation Ground Flood Storage	Bar Pool Brook	Flood Storage	Construction of an offline flood storage area within the recreational ground with offtake weir, embankments and spillway	Nuneaton Recreational Ground	Large open area suitable for a flood storage area / two stage channel. Land is owned by Nun & Bedworth Borough Council. Flood storage area is located immediately upstream of where the Bar Pool Brook enters long culvert before discharging into the River Anker and so could be optimal location. Accesible via Pool Bank Street.	Planning permission and consents required. Works within a public park so health and safety and security issues to consider. Located immediately adjacent to a scheduled monument. May be undesirable to carry out works here. Conservation area, with mature trees to consider.	2	1	-1	0	0	1	-1	2	Likely
14	Increase Queens Road Culvert	Bar Pool Brook	Conveyance	Localised upsizing the existing culverts from the recreational ground and underneath Queens Road to increase the capacity of the sewer system/culverted watercourse and reduce surcharging	Queens Road	If the culvert is found to be creating a "bottleneck" for flows resulting in surcharging at the Recreation Ground, then by locally increasing the capacity of the culvert, flood risk could be reduced to the town centre.	Depending on location of bottleneck, there could be notable disruption to travel, connectivity to the town centre and local businesses. Likely impact of services adding to stakeholders and capital costs.	2	-1	-1	1	-2	0	0	-1	Possible
15	Richmond Road Park	Richmond Road Catchment	Flood Storage	Construction of a flood storage area within playing fields south of Merevale Road	Richmond Road	School playing fields where a flood storage area could be constructed immediately upstream of urbanised area where flood risk is assumed.	Owned by Queens C of E School and used for playing fields. Planning permission, consents and land purchase required. Baseline shows that the area only floods in 100+CC, therefore option unlikely to attract enough FDGIA to proceed. Mechanism due to canal overtopping.	0	1	-1	-1	-1	0	-1	-3	Unlikely
16	NFM	Bar Pool Brook and Whytell Brook	NFM	Using a range of Natural Flood Management measures in the upper catchment to slow the flow and offer some attenuation	Upstream catchment	Some opportunities within the upper catchment to implement NFM measures to slow flow and offer small degree of attenuation	Catchment is reasonably large and therefore not ideally suited to NFM for flood risk benefits. Would need to be implemented with other options. Consents and engagement with various landowners required.	-2	2	2	-2	-2	2	0	0	Unlikely

2.2 Shortlist Options

Following the production of the long list, consultation with WCC was undertaken and the model developed further. It was then established that additional surveys were required to improve confidence in flood mechanisms along several reaches of the model, see the Baseline Hydraulic Modelling Report[6] for more information. As a result of these updates, there were changes in flood mechanism within the catchment and some of the options were reassessed.

The mechanism for flooding in Nuneaton town centre is flow coming out of Coventry Canal and flowing overland along the B4102 towards the town centre. The canal is fed by the Bar Pool Brook and high flows from this watercourse cause the canal to overtop. Upstream of the Bar Pool Brook and canal confluence, the Bar Pool Brook is in culvert which limits flows. Where the culvert limits flow, overland flow from Whittleford Park feeds the Bar Pool Brook and Coventry Canal.

Cutting off the flow path from Whittleford Park towards the canal prevents the canal from overtopping and in turn reduces flood risk in the town centre.

The updated assessment of the options is summarised in the Table 2-2.

Table 2-2: Updated shortlist options

ID	Option Name	Option Description	Key Opportunities	Key Constraints	Initial RAG	Change Following Model Update
1	Whytell Pool Flood Storage	Construction of a flood storage area with an impounding structure and spillway on the Whyttle Brook in Whyttle Pool area	Open space upstream of the existing Whytell Pool to create an additional flood storage area to attentuate flows and prevent surcharging at the Beverley Avenue culvert. Access is achievable via Campbell Close. Baseline shows that the area immediately downstream only floods in 100+CC, therefore option unlikely to attract enough FDGIA to proceed.	Situated within a nature reserve and Whytell Pool is used frequently for fishing and by local residents. Modelling of this option is needed in order to confirm the scale of flood storage required and therefore whether the economics would stack up. Planning permission and consents required.	Unlikely	Shortlisted – the option was considered further as most of the flow entering the Bar Pool Brook comes from this tributary. Upstream storage here could help reduce the need for downstream storage.
4	Whittleford Park Flood Storage	Construction of a flood storage area upstream in Whittleford Park with off-take weir, control structure and embankments	Open area where there are existing ponds so should also be suitable to flood storage. Land owned by Nun & Bed Borough Council which could be contribution in kind. Access via Queen Elizabeth Rd and space for a site compound	Located near the top of the catchment and flood risk is a long way downstream so may not have any benefits. Could fall under the Reservoir Act as cascading ponds. Planning permission and consents required. May be an option to consider if the volumes of flood storage required cannot be met elsewhere.	Possible	Shortlisted – modelling showed that the mechanisms of flooding in Whittleford Park directly influence flooding in the town centre. Therefore, storage of flow here benefits town.

[6] Baseline Hydraulic Modelling Report (AECOM), 2022

ID	Option Name	Option Description	Key Opportunities	Key Constraints	Initial RAG	Change Following Model Update
5	Willow Road Flood Storage	Construction of a flood storage area in the open fields adjacent to Willow Road	Open space downstream of existing ponds. Land owned by Nun & Bedworth Borough Council. Access via Willow Road and plenty of space for a compound. Located further downstream so could attenuate flows on Bar Pool Brook before entering the canal	Located within a historic landfill site and therefore not suitable for a flood storage area	Unlikely	Shortlisted – Overland flow in this area flows into the Bar Pool Brook and Nuneaton Canal causing flooding in the town centre. The main factor in reducing this risk is to prevent this flow path. Storage would have to be above ground due to landfill with an embankment situated as close to Bar Pool Brook pools as possible.
9	Between Canal and Railway Storage	Construction of a flood storage area within the parcel of land downstream of the canal and upstream of the railway line. Includes construction of embankments, control structure and spillway	Open area where water could be stored to attenuate flows from the Bar Pool Brook and the overflow from the weir which could deliver benefits to downstream areas of Manor Court Road, Queens Road and the town centre. One of few locations downstream of the canal.	Approximately 5,000m² of land available where water could be stored. Poor access due to small underpass. Access via canal only alternative. Planning permission and consents required. Network rail and Canal and River Trust are stakeholders. Remote underused area, so potential for improved area for public access. No protected species found in recent surveys.	Likely	Ruled Out – Updated mechanisms show this area is completed inundated in baseline runs. Area is former landfill and would have to be excavated to achieve any storage.
13	Nuneaton Recreation Ground Flood Storage	Construction of an offline flood storage area within the recreational ground with offtake weir, embankments and spillway	Large open area suitable for a flood storage area / two stage channel. Land is owned by Nun & Bedworth Borough Council. Flood storage area is located immediately upstream of where the Bar Pool Brook enters long culvert before discharging into the River Anker and so could be optimal location. Accesible via Pool Bank Street.	Planning permission and consents required. Works within a public park so health and safety and security issues to consider. Located immediately adjacent to a scheduled monument. May be undesirable to carry out works here. Conservation area, with mature trees to consider.	Likely	Ruled Out – too far downstream to make a difference to flooding in the town centre as flow comes from the Canal as well as the park.

ID	Option Name	Option Description	Key Opportunities	Key Constraints	Initial RAG	Change Following Model Update
14	Increase Queens Road Culvert	Localised upsizing the existing culverts from the recreational ground and underneath Queens Road to increase the capacity of the sewer system/culverted watercourse and reduce surcharging	If the culvert is found to be creating a "bottleneck" for flows resulting in surcharging at the Recreation Ground, then by locally increasing the capacity of the culvert, flood risk could be reduced to the town centre.	Depending on location of bottleneck, there could be notable disruption to travel, connectivity to the town centre and local businesses. Likely impact of services adding to stakeholders and capital costs.	Possible	Ruled Out – too far downstream to make a difference to flooding in the town centre as flow comes from the Canal as well as the park.

2.3 Shortlist Option Modelling

Hydraulic modelling was undertaken of the three shortlisted options to ascertain their effectiveness. The scenarios were modelled as follows:

- Option 4 and 5 were modelled together, neither option alone would store enough volume to cut off the overland flow path to canal – so the two options were modelled in conjunction.
- Option 1, 4 and 5 were modelled together as the inclusion of the upstream storage and option 1 may reduce the volume stored at option 4 and 5

The options were modelled for the 1% AEP and 1% AEP+51%CC scenarios.

2.4 Preferred Option

The results of the hydraulic modelling showed that storage in Whittleford Park and near Willow Road, Options 4 and 5, cut off the flow path to the Nuneaton Canal and therefore flooding in the town centre. The modelling showed that despite storing 20,000m3 in Option 1, this flow then eventually made it's way downstream and into the storage areas 4 and 5 before their respective storage volumes had receded. Therefore, including Option 1 within the combination was ruled out based on technical feasibility.

The option 4 element consists of a spill from the Bar Pool Brook into a designated lowered storage are, as shown in Figure 2-2, and a small embankment upstream. Further details can be seen in the Nuneaton Preferred Option Summary[7]

[7] Nuneaton Preferred Option Summary (AECOM), 2022

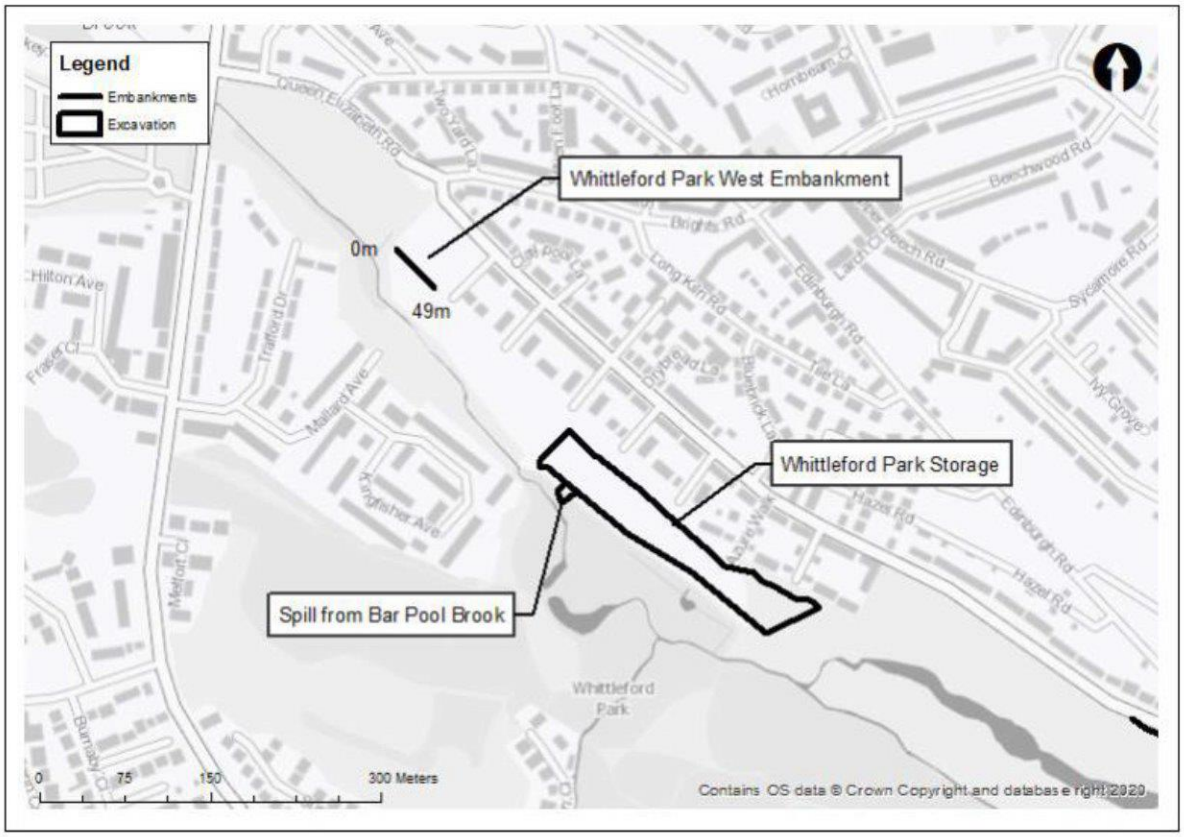


Figure 2-2: Option 4 element of the preferred option

Option 5 consists of a primary embankment which cuts off the overland flow path and stores flow within Whittleford Park. There is a secondary embankment which prevent localised flooding, as shown in Figure 2-3. As the volumes stored within the option will exceed 100,000m3, the need for a spillway was considered. However, there are not realistic alignments for a spillway as there is no watercourse to spill in to and the area downstream of the bund is former landfill. Less flow could be stored within the area by reducing the bund height, but this would mean overtopping occurs, and again without controlled overtopping to a watercourse, this overtopping could impact properties surrounding the bund.

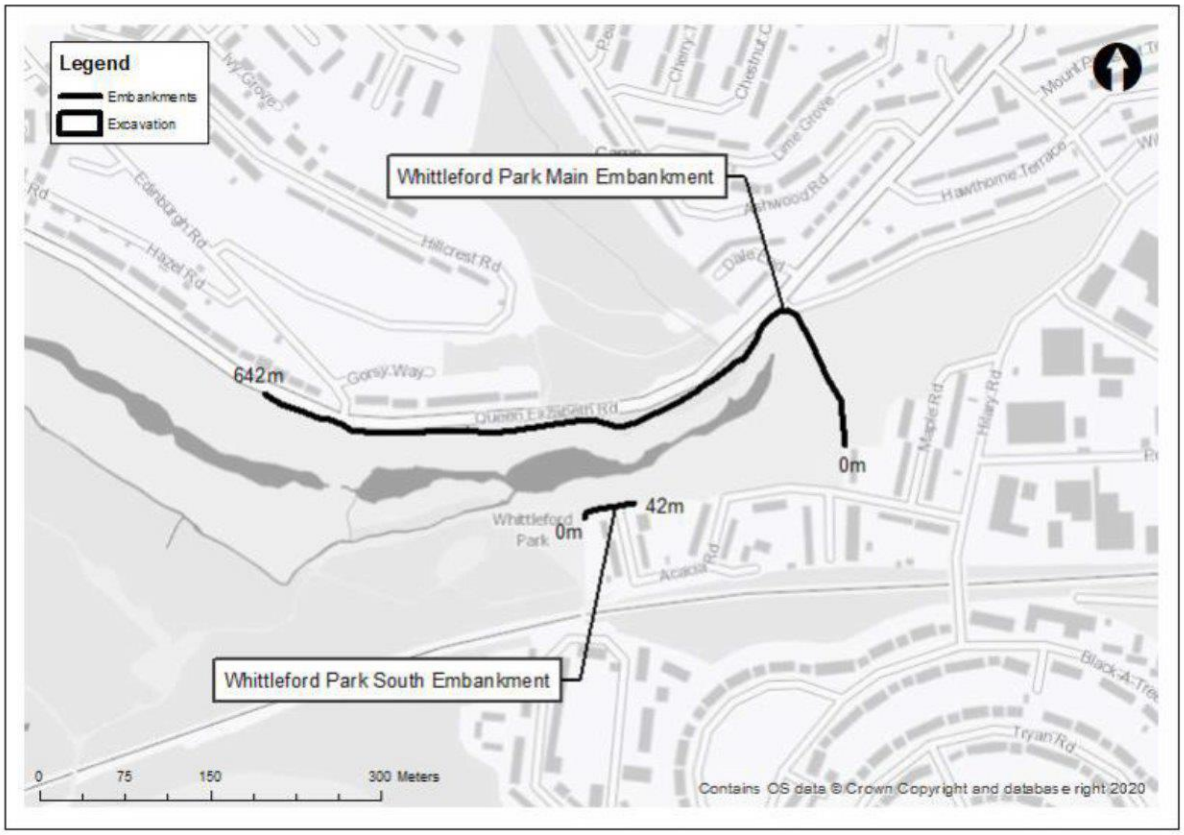


Figure 2-3: Option 5 element of the preferred option

3. Preferred Option Costing

The cost estimations for the preferred option are provided using the best available information, estimated from rates in the civil engineering price book SPONS (2020). These estimates have been uplifted by 12% to reflect rising material and construction costs, resulting from the COVID-19 pandemic.

Preliminary costs have been included at 60% of the total construction costs (including waterside working). An additional 25% has also been included for appraisal and design costs. These costs have been multiplied by a risk contingency of 50% to account for unknown risks such as site compound size / location, potential for buried services, unknown access constraints and ancillary items. In line with FCERM-AG policy, an optimism bias of 30% was then applied as the project is still at outline design stage.

Finally, an additional annual 7% allowance for the construction works have been included, compounded over the next three years, as construction is not expected to take place until 2025. This is in line with the latest guidance from the Environment Agency Delivery Portfolio Board[8].

Table 3-1 below provides a summary of the costs.

Table 3-1: Option Costs

Preferred Option	Flood Storage Area	Whittleford Park Main Embankment	Whittleford Park South Embankment	Whittleford Park West Embankment	Total
Total Build up Cost, plus 12% uplift (£k)	698	548	18	258	1,289
Preliminaries (£k)	419	329	11	15	773
Appraisal / Design (£k)	174	137	5	6	322
Risk Contingency (£k)	645	507	17	24	1,192
Optimism Bias (£k)	581	456	15	21	1,073
Inflation (£k)	566	445	15	21	1,046
Total Cost (£k)	3,084	2,420	79	114	5,700

4. Preferred Option Benefits

The benefits of the preferred option have been calculated to determine the benefit cost ratio and demonstrate the economic viability of the option. The benefits are calculated as the difference between the baseline 'Do Minimum' damages and the option damages derived from the option modelling. There is no comparison of the benefit cost ratio between options, as the preferred option is the only option taken forward within the economic appraisal.

The ABCR is calculated by dividing the whole life benefits of an option by the whole life costs of an option. The benefits and costs used in the calculation are in PV terms. An ABCR >1 indicates that there is an economic justification for an option (though other options may have a stronger economic case).

Table 4-1 presents the whole life PV option benefits, as well as the PV costs and ABCR.

Table 4-1: Option Benefits

Option	Whole Life PV Cost (£k)	Whole Life PV Benefits (£k)	ABCR
Preferred Option	5,700	16,563	2.90

[8] Environment Agency (2021) Managing financial pressure on the FCRM programme: Guidance note for Risk Management Authorities on the effect of increasing inflation and financial pressures on scheme viability.

5. Partnership Funding

This appraisal demonstrates economic justification for the preferred option assessed. However, in order to confirm this is the economic leading option in line with FCERM decision rules, further appraisal of the optimum standard of protection will be required (recommended next step).

The costs and benefits of a lower and higher standard scheme should be appraised and subjected to the Incremental Benefit Cost Ratio (IBCR) criteria to confirm the economic optimum and assess FCERM GiA eligibility. The preferred option for the scheme may then be selected based on further consideration of contributions, sensitivity testing and wider objectives.

Once this has been confirmed the final PF score for the scheme can be provided, However, to provide an indication of the raw score, and scale of funding contributions required to deliver a scheme, and initial PF score has been provided below for decision making.

5.1 Partnership Funding Overview

The DEFRA Flood and Coastal Resilience Partnership Funding arrangement defines the level of flood risk management Grant-in Aid (GiA) a project could achieve based on a series of DEFRA Outcome Measure (OM) targets. There are three OMs under which this project can attract GiA:

- **OM1**: All benefits arising as a result of the investment, less than those valued under the other outcome measures;
- **OM2**: Households moved from one category of flood risk to a lower category; and,
- **OM4**: Statutory environmental obligations met through flood and erosion risk management.

As the study area is inland, there is no risk of erosion and Outcome Measure 3 (households better protected against coastal erosion) has not been included.

A full table of the OMs and benefits under each that will qualify for national funding is provided in the latest DEFRA GiA guidance. The table is reproduced in Table 5-1. The assumed flood risk categories and probabilities are in Table 5-2.

Table 5-1: Outcome Measures Summary (Environment Agency, 2021)

OM no.	Outcome Measure definition	Benefits and outcomes qualifying for national funding	Payment rate	Examples of funding levels from Government
OM1	Average benefit to cost ratio of schemes	Under OM1, present value of whole-life benefits of the current investment, less benefits paid for or payments made under the other outcome measures.	OM1a: 6p per £1 of qualifying benefit OM1b: 20p per £1 of qualifying benefit	These include avoidance of damages to e.g. business, agriculture, local government, communications, infrastructure, utilities and public health
OM1a	*OM1a relates to overall benefits of a scheme*			
OM1b	*OM1b is a subset of 1a, people related benefits*			
OM2	Households moved from one category of flood risk to a lower category	Under OM2, present value of direct damages to residential properties and their contents avoided, in the: -20% most deprived areas -21-40% most deprived areas -60% least deprived areas	45p per £1 30p per £1 20p per £1	Based on moving a single household from a higher risk category to a lower risk for the duration of the project appraisal period
OM2a	*OM2a are measured as households at risk today, better protected by the investment*			
OM2b	*OM2b are measured as additional households at risk up to 2041 that are better protected by the investment*			

OM no.	Outcome Measure definition	Benefits and outcomes qualifying for national funding	Payment rate	Examples of funding levels from Government
OM4a	Habitats enhanced – habitat conditions restored and enhanced	OM4a is for habitat improvements, based on the type and condition of the habitat 'before' compared to 'after'	20p per £1 qualifying benefit.	Based on hectares of habitat by condition and type restored or enhanced
OM4b	Rivers enhanced – river conditions restored and improved	OM4b is for river improvements, based on comprehensive restoration, partial restoration or physical/habitat enhancement		Based on kilometers of habitat restored or improved

Table 5-2: Flood Risk Categories and Assumed Flood Probabilities (Environment Agency, 2021)

Risk category	Annual chance of flooding
Very significant	5% or greater (standard of protection less than or equal to 1:20)
Significant risk	Greater than 2% but less than 5% (standard of protection 1:21 to 1:49
Intermediate risk	Greater than 1% but less than 2% (standard of protection 1:50 to 1:99)
Moderate risk	Greater than 0.5 % but less than or equal to 1% (standard of protection 1:100 to 1:199)
Low risk	0.5% or less (standard of protection 1:200 or above)

The Environment Agency has prepared a standard spreadsheet calculator (2021 version) to calculate the level of FCERM GiA based on a series of input parameters. These include whole life option costs, benefits (OM1) and the number of properties moving from one flood risk band to another (OM2s). The partnership funding calculator provides a GiA contribution (£) and an initial 'Raw' OM score which can be used to assess the likelihood of a scheme attracting partnership funding. The GiA contribution represents a theoretical maximum funding value that could be available based upon the outcomes delivered by the scheme.

The DEFRA policy statement puts forward a minimum OM threshold of 100% to receive national funding, but notes that any contributions secured towards projects scoring 100% or above can either a) reduce the cost of the scheme to the national taxpayer, making it more likely to go ahead sooner rather than later or b) be used to help fund other local schemes in the local strategy. For more details and definitions of each term used in the Partnership Funding calculator please refer to the Partnership Funding guidance documents (2021).

Indicative Partnership Funding Score

The Partnership Funding score for the preferred option has been calculated based on the costs and benefits calculated in Section 4.

The benefit period for the Partnership Funding calculator is 50 years. This is in line with the Partnership Funding Guidance[9] which specifies that the duration of benefits should relate to how long the asset providing the defence are expected to last before the next capital investment that exceeds 20% of the project cost is required.

Table 5-3 presents the estimated GiA available as £1,122k. This GiA will only become available if the funding shortfall of £4,578k is met. Once this funding shortfall is met, the raw partnership funding score would increase from 20% to 100% and the GiA can be granted.

Table 5-3: Partnership Funding Score for the Leading Economic Option

Option	Duration of Benefits	Benefit Cost Ratio	Raw Partnership Funding Score	Funding Shortfall (£k)	Estimated amount of GiA available (£k)
Preferred Option	50 years	2.9	20%	4,578	1,122

[9] Environment Agency (2014) Calculate Grant in Aid funding for flood and coastal erosion risk management projects: Guidance for risk management authorities. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1026853/Calculate_grant-in-aid__GIA__funding_for_FCERM_projects__2014_.pdf [Accessed 29 November 2021]

Table 5-4 and Table 5-5 (overleaf) present the properties moving between flood risk bands with the scheme in place, over the 50 year benefit period, used to calculate OM2As and OM2Bs. This shows the properties whose risk is improved by the scheme, as well as those where the risk is unchanged or increases. The flood risk bands are provided within the Partnership Funding calculator as follows:

- Very Significant risk >=5%
- Significant risk <5% to >2%
- Intermediate risk 2% to >1%
- Moderate risk 1% to >0.5%
- Low risk <=0.5%

Table 5-4: OM2A - Properties at Risk Today Moving Between Flood Risk Bands (Over the next 50 years)

Risk Bands	Level of Property Deprivation		
	20% most deprived	21% to 40% most deprived	60% least deprived
Moderate risk to Low/No risk	3	10	3
Moderate risk to Moderate risk	0	8	1
Moderate risk to Intermediate risk	0	6	0
Moderate risk to Significant risk	0	0	0
Moderate risk to Very Significant risk	0	0	0
Intermediate risk to Low/No risk	1	1	0
Intermediate risk to Moderate risk	0	4	2
Intermediate risk to Intermediate risk	0	0	0
Intermediate risk to Significant risk	0	0	0
Intermediate risk to Very Significant risk	0	0	0
Significant risk to Low/No risk	2	1	1
Significant risk to Moderate risk	0	0	0
Significant risk to Intermediate risk	1	0	0
Significant risk to Significant risk	1	1	0
Significant risk to Very Significant risk	0	0	0
Very Significant risk to Low/No risk	2	0	2
Very Significant risk to Moderate risk	0	1	0
Very Significant risk to Intermediate Risk	0	0	0
Very Significant risk to Significant risk	0	0	0
Very Significant risk to Very Significant risk	0	0	0

Table 5-5: OM2B - Properties at Risk in 2040 Moving Between Flood Risk Bands (Over the next 50 years)

Risk Bands	Level of Property Deprivation		
	20% most deprived	21% to 40% most deprived	60% least deprived
Moderate risk to Low/No risk	1	1	0
Moderate risk to Moderate risk	0	0	0
Moderate risk to Intermediate risk	0	0	0
Moderate risk to Significant risk	0	0	0
Moderate risk to Very Significant risk	0	0	0
Intermediate risk to Low/No risk	0	0	0
Intermediate risk to Moderate risk	0	0	0
Intermediate risk to Intermediate risk	0	0	0
Intermediate risk to Significant risk	0	0	0
Intermediate risk to Very Significant risk	0	0	0
Significant risk to Low/No risk	0	0	0
Significant risk to Moderate risk	0	0	0
Significant risk to Intermediate risk	0	0	0
Significant risk to Significant risk	0	0	0
Significant risk to Very Significant risk	0	0	0
Very Significant risk to Low/No risk	0	0	0
Very Significant risk to Moderate risk	0	0	0
Very Significant risk to Intermediate Risk	0	0	0
Very Significant risk to Significant risk	0	0	0
Very Significant risk to Very Significant risk	0	0	0

6. Sensitivity Testing

A number of factors have been considered during the economic assessment to ensure that the results are robust against a wide range of sensitivities. These sensitivities include property threshold levels, increased / decreased option costs and increased / decreased option benefits.

Property Threshold Levels

Property threshold levels have been assumed to be 0.15m in the assessment. To test the sensitivity of this assumption in relation to the baseline damages, the property threshold has been decreased to 0.05 and 0.1m, then increased to 0.2m. Table 6-1 presents the changes in the total 'Do Minimum' baseline damages with the different threshold values. This indicates that the economic assessment is sensitive to the changes in property threshold value, and decreasing the property threshold to 0.1m would increase the damages by 45%. This comparison demonstrates that assuming a 0.15m threshold is a conservative approach.

It is highly recommended that a more detailed property threshold survey is undertaken as soon as possible to refine the assumptions made and improve confidence in the economic and funding case for the scheme.

Table 6-1: Property Threshold Sensitivity Test

Option	Property threshold Level			
	0.05m	0.1m	0.15m (original)	0.2m
Do Minimum	37,500	25,826	17,778	12,333
Percentage change from original	111%	45%	N/A	31%

Option Costs

According to the HM Treasury Green Book, Optimism Bias should be applied to the costs of a scheme to account for uncertainty in:

- Capital costs;
- Works duration;
- Operating costs; and,
- Under delivery of benefits.

Table 6-2 demonstrates whether applying an increase or decrease in construction costs by 30% significantly impacts the economic case for each of the options that have been developed. With the cost increased by 30% the benefit cost ratio remains above 1 and therefore the economic case remains justified.

Table 6-2: Optimism Bias Sensitivity Test

Option	PV Benefits (£k)	PV Costs (£k)			ABCR		
		30% Decrease	Original	30% Increase	30% Decrease	Original	30% Increase
Preferred Option	16,563	3,990	5,700	7,410	4.15	2.90	2.24

Partnership Funding Sensitivity

The Partnership Funding Calculator for the preferred option has been sensitivity tested to review the impact of increasing the whole life PV costs and a reduction of the schemes duration would have on the PF score. Table 6-3 indicates that an increase in the whole life PV costs causes the PF score to reduce, as does a reduction in the duration of the benefit period (from 50 to 37 years).

Table 6-3: Partnership Funding Sensitivity Test

Option	Original PF Score	PF Score	
		Increase in Whole Life PV costs by 25%	Reduced Duration of Benefits by 25%
Preferred Option	20%	16%	19%

Appendix A Long List Options

Nuneaton Flood Scheme
WCC/NBBC roundtable workshop
Meeting Notes

9:30am to 11:00am 12 July 2022
Microsoft Teams

Purpose: To present the outcomes of the feasibility stage of the Bar Pool Brook Flood Alleviation Scheme, including a discussion on the key delivery challenges and to seek an agreement on the future direction of the project.

Chair: David Ayton-Hill

Attendees

Cllr Jeff Clarke, Elected Member	JC	WCC/NBBC
Cllr Martin Watson, Elected member	MW	WCC
David Ayton-Hill, Assistant Director, Communities	DAH	WCC
Catherine Marks, TN Programme Manager	CM	WCC
Les Snowdon, Head of Estates & Planning	LS	NBBC
Danny McAree, Principal Land and Property Officer	DM	NBBC
Matt Crossley, Green Spaces Planning Officer	MC	NBBC
David Truslove, Parks and Green Space Manager	DT	NBBC
Tom Hobbs, TF/FHSF Programme Manager	TH	NBBC
Jagjit Mahal, Flood Risk Management Delivery Lead	JM	WCC
Dan Lamb, Senior Flood Risk Management Engineer	DL	WCC
Reena Ghattaura, Business Support Officer	RG	WCC
Daniel Cresswell, Engineering Design Services	DC	WCC

Apologies

Cllr Kristofer Wilson, Elected Member	NBBC
Cllr Clare Golby, Elected Member	NBBC
Cllr Christopher Watkins, Elected Member	NBBC
Cllr Wallace Redford, Elected Member	WCC
Scott Tompkins, Assistant Director, Environment Services	WCC
Brent Davis, Chief Executive	NBBC
Dawn Dawson, Director, Housing, Economy and Communities	NBBC
Helena Lidgate, Green Space Officer	NBBC
Kevin Hollis, Director, Public Services	NBBC

Agenda

No.	Item	Lead
1	Welcome and Introductions	DAH
2	Background and progress to date	DL
3	Initial design cost and benefit	DL
4	Discussion on priority moving forward	DL / All
5	AOB	

1. Welcome and Introductions (DAH)

DAH – We'd like to use this opportunity to show where we are in developing a solution to the flood risk in Nuneaton, what our options are and discuss how best to move forward.

2. Background and progress to date (DL)

Please refer to the accompanying slides from the meeting *'NBBC-WCC Flood Workshop – 12July2022'*

DL presented the background context of the flooding issues in Nuneaton, and the survey and modelling work completed to better understand the existing flood risk to Transforming Nuneaton sites and the wider Bar Pool Brook catchment.

MW – Will these maps be made public – for residents and developers to view?

DL – At the moment, the updated flood map is not available publicly. This is because the model is going through a formal review process with the Environment Agency. Once this review is complete, we will look to update the external-facing EA Flood Map for Planning as it gives a much better understanding of the flood risk than the current map. By updating the flood map, we'll be removing quite a few properties from flood risk also.

JC – Any detail on when these areas were last flooded?

DL – [with reference to Slide 5] the flood extents from the updated WCC/AECOM model shown in the slide indicate the 1 in 100-year event (in dark blue) and 1 in 1000-year event (light blue). These are typically extreme flood events and therefore plausibly have not been experienced in the lifetime of anyone living/working in these areas. We surveyed a number of residents along the catchment, some of whom remember smaller flood events. To my knowledge, Nuneaton town centre itself hasn't flooded from the river since the relief channel was built.

3. Initial design cost and benefit

Please refer to the accompanying slides from the meeting *'NBBC-WCC Flood Workshop – 12July2022'*

JC – What is the possible income of electricity generation – we should be able to capitalise on the flow of water – therefore as a reservoir we should be able to draw electricity from it, should we not?

DL – We have not looked at this option, as if we were to build the reservoir like this initial design, it would only fill up in extreme flood events, so unlikely to be able to generate electricity from it.

JC – Looking at the reservoir scheme from the outset, I am not sure why we should progress it on this basis.

DAH – We are looking at different options to mitigate the risk.

4. Discussion on priority moving forward (DL / All)

Please refer to the accompanying slides from the meeting *'NBBC-WCC Flood Workshop – 12July2022'*

MW – Regarding the need for significant investment in the scheme, could we look at private funding? If we can provide them certainty, private funding could be helpful.

JC – The whole rationale is to ensure we can develop in the town centre as well as look at its financial benefits for developers and investors. We should look forward to redeveloping the town centre, but how would what you propose do that?

DL – We wouldn't be able to remove or reduce any flood zones without the reservoir option – we can only increase resilience of the properties at risk, which should positively impact the premium of their insurance – the reservoir option is not currently affordable.

DAH – We are focussing on the reduction of the flood risk. Perhaps we could consider whether funding could be made available to de-risk development sites as they come forward. Can we live with the flood risks, but find ways to reduce it?

LS – Option 2 seeking to address site levels - how do we do this in town centre? Especially in regard to smaller plots in private ownership, will they have similar issues to the larger properties?

DL – EA funding rules state mean that we won't be able to offer PFR on new properties – for those ones it is more economical to design out the risk when you're at the early stage of planning. FHSF may have different funding criteria. PFR is typically used on existing properties in flood risk areas where larger interventions are not economical or technically feasible.

JC – There are already some flood mitigations on the Bar Pool Brook near Whittleford, where there are 2-3 bodies of water. Some of the Transforming Nuneaton sites are shown to partly flood. How we would mitigate, build, and enable development in those areas and who is bringing funding to the developers to do that?

DL – There are two existing basins in Whittleford park, these basins are in the flood model in 3D, Lidar and topo surveys takes into account the capacity of those existing lakes, so their benefit is in the model. For the reservoir option, we need those embankments and an additional storage area as the volumes are large.

Looking at the red stars [slide 7] flood risk has increased to some sites when compared to existing EA flood map. Conversations on these sites are required on how to mitigate risks, we would need to look at layouts. However, the green stars show TN sites that are significantly benefitting from the updated modelling. Overall there is an improvement from the new model with regards to flood extent.

JC – The bus station site – a new theatre may be going there – can you incorporate that? It would also need to be included in the funding. We are constrained to some extent to get the scheme together due to funding; it is identifying where the funds come from and which bodies.

DAH – Bringing private sector investments into town will help the town centre and help to bridge the gap in funding.

TH – Design on the bus station site is at an early stage. Within the concept design we will need to build in flood mitigation and this will be an additional cost, it is not ideal but it is needed. In terms of Future High Street Fund (FHSF), it is a time-limited fund and needs to be used by March 2024. We cannot use that to support future private developments in the future, so Property Flood Resilience is a good alternative to use the allocated funding, providing we can meet business case and BCR requirements.

DL – EA provide us with a lot of guidance on Property Flood Resilience (PFR) to demonstrate economic benefits such as costs vs damages. We need to understand the details DLUHC would need from us if PFR would still qualify for funding, but we may be able to do the economic case in-house.

JC – For a PFR scheme, what time scales are we looking at?

DL – We need to have a conversation with DLUHC to firstly check we can use the FHSF funding for a PFR scheme. I cannot give any details on time frames currently as, if the answer from DLUHC is yes, we would need to update the business case. Then resident and business owner engagement would begin. Based on experience of delivering PFR schemes, meeting the March 2024 deadline feels achievable providing we can get the ok from DLUHC as soon as possible to start the ball rolling.

CM – Depending on the feedback from DLUHC on areas eligible for these schemes, we may find that Queens Road for example sits outside of the eligible area for the FHSF which is focussed on the town centre. Where would be the focus for the PFR scheme?

DL – From a previous conversation with TH and DD, it is likely that Queens Road wouldn't be eligible for FHSF funding as it sits outside the town centre area defined in the business case. We will confirm that with DLUHC. We could consider a two-phase scheme, where the first phase focuses on the town centre using FHSF. And the second phase focuses on other areas at flood risk using EA funding, which often takes a long time to get approved.

JC – We don't want to be distracted from town centre opportunities.

JC – The updated flood map [referring to slide 7] appears to show more flood risk in the town than the current map. Are we doing the right thing updating the flood map with this information?

DAH – Both images are showing the current flood risk. The existing map on the left is an estimation and the updated flood map on the right is more specific. It portrays a better understanding rather than producing an increase.

JC – Publication of these maps – if we do as is now without any work to mitigate – are we at risks of losing potential projects or developers coming into the town?

DL – There is a change to flood risk to some areas but an overall reduction to properties at flood risk. Reviewing the TN sites, the updated mapping shows there are no longer any sites that are mostly covered in Flood Zone 3, so in theory could make re-developing these sites more workable from a flood risk perspective.

DAH – To summarise, we have a unanimous view that the reservoir option is too expensive with liabilities for ongoing maintenance. We have the business case and economic assessment for this option and for now we'll leave that option "sitting on the shelf". We will focus on smaller scale PFR interventions using the funding from DLUHC. How do we present this to the market and how do we support this?

CM – CM will update the Transforming Nuneaton Programme Board with the outcome from this meeting and provide the Board with an opportunity to give any final input on the direction of the project.

5. AOB

None

Meeting ended.

Change Request Form

Project:	Flood Alleviation	**Requested by:**	Tom Hobbs
Programme:	Regeneration	**Date:**	18.01.23
Supervisor Approval:	Dawn Dawson	**Request No:**	R07/1
Change Description	To cancel the Flood Alleviation project due to the inability to deliver this project within the budget or timescale of the Future High Streets Fund.		
Change Reason	Following design work the cost for delivery of the original scheme was estimated at £9.5million whilst for the budget is £2.6million. Warwickshire County Council subsequently explored the viability of a smaller property flood resilience scheme to see if it could be delivered. However following a viability review WCC have informed NBBC that this reduced scheme is not viable, neither being deliverable with the timescale, budget or likely to achieve a suitable benefit cost ratio for the Future High Streets Fund.		
Impact of Change	Cancelling the scheme will mean that no further improvements to Nuneaton town centre flood protection will be made. However, through the updated flood modelling undertake as part of the development of the project a more accurate flood made of Nuneaton Town Centre has been created and this does provide an overall improvement for the town centre.		
Priority please tick box	☐ **Low**	☐ **Medium**	☑ **High**
Cost Implications:	£1million of Future High Streets Funding will not be claimed from government for this scheme.		
Action Taken:	Formally agree with WCC to bring the project to a close.		

Status	**In Review**	**Approved**	**Rejected**
Reason			
Approved By:			
Approved Date:			

Briefing Note to TN Members (Feb 2023)
Nuneaton flood scheme - Bar Pool Brook, Nuneaton

This briefing note summarises the outcome of the work to date on the feasibility of a flood alleviation scheme on the Bar Pool Brook catchment in Nuneaton.

What is the background to the project?

Using funding from the Coventry & Warwickshire LEP and the County Council, our consultants AECOM re-modelled the entire Bar Pool Brook catchment to better understand the flood risk to the town and the complex interactions that exist with the Coventry Canal.

The objective was to identify a preferred flood scheme design that reduced high flood risk areas within the town centre.

An iterative flood modelling and assessment process reduced a long list of around 15 possible locations and options for the scheme design. The option that passed this process and met the objective was a design involving the creation of flood storage areas, retaining walls and embankments, and associated structures in Whittleford Park.

The option in Whittleford Park was costed at circa £9.5m and faced a funding shortfall of around £6.9m. Furthermore the design would be designated as a reservoir due to its size and would therefore carry statutory duties.

Following a presentation to a number of TN Board members and councillors on 12 July 2022, it was agreed that the reservoir option would not be progressed any further but instead focus on exploring the feasibility of smaller-scale Property Flood Resilience to at-risk town centre properties.

What progress has been made with exploring Property Flood Resilience (PFR)?

Warwickshire County Council instructed consultants in Autumn 2022 to provide an economic assessment and a review of the feasibility of installing Property Flood Resilience (PFR) measures to the at-risk commercial properties in Nuneaton town centre. Unfortunately, this concluded that a PFR scheme is not a viable option on technical feasibility grounds within the time frame of the Future High Street Fund.

What are the reasons that a PFR scheme is not viable?

The main reasons for this are:

a) Extensive building work needed to property frontages for passive measures (mainly due to cladding, large glass fronts and sliding doors)
b) Prohibitively high cost and disruption to businesses in undertaking point a
c) Level thresholds on most commercial properties is likely to mean kitemarked flood products would be unavailable
d) Active measures (e.g. barrier deployment) require both a river and surface water flood warning service to allow for activation of measures. No suitable service currently exists for either of these risks. Establishing a well-calibrated and reliable flood warning service for both river and surface water risk is considered unachievable within the scope of the project given the technical lead-in time for implementation. Notwithstanding time, it may simply not

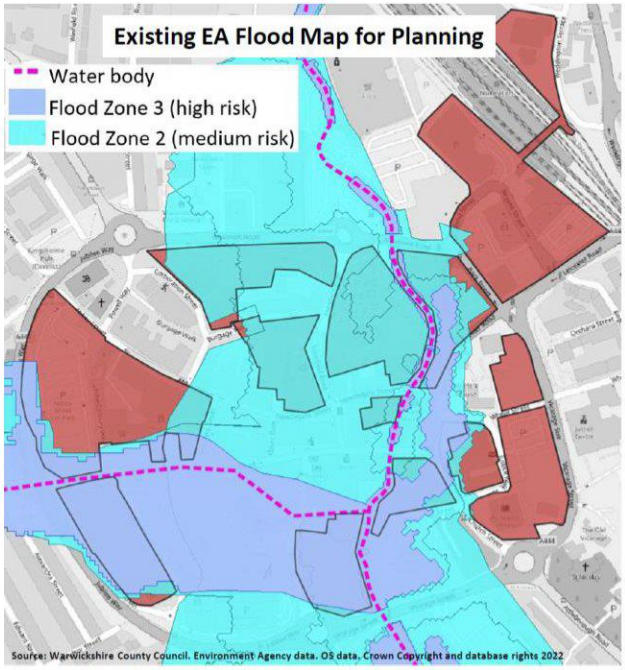
be possible to achieve this for surface water risks given the challenges in forecasting impacts with a suitable confidence in location and rainfall intensity and enough of a lead time for businesses to respond and deploy their PFR measures.

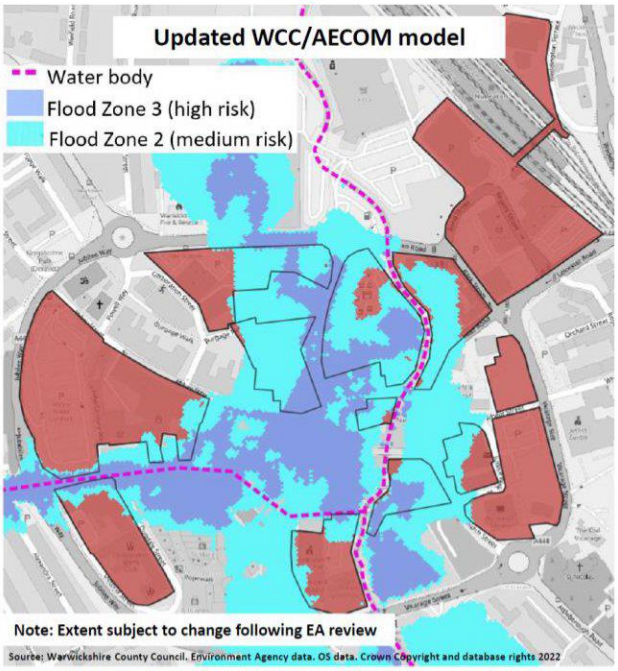
e) Likely undesirable requirement for businesses to store, exercise and deploy active measures, becoming ineffective unless they can be deployed at short notice and outside of business hours. Deployment of active measures is also likely to cause disruption, with roads and pedestrian areas needing closing or diverting and businesses may need to close – even for false alarms.

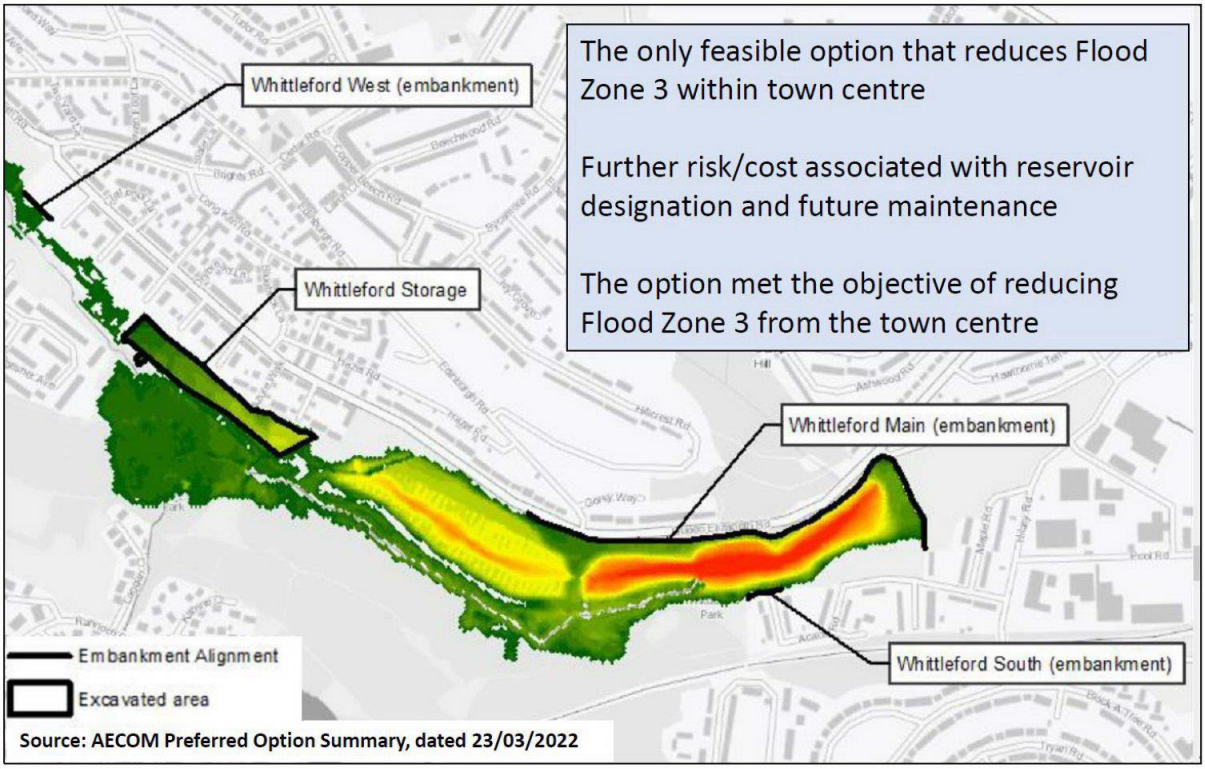
What are the benefits and outcomes this work has provided?

Whilst the outcome of the work to date will not result in the delivery of a flood scheme within Nuneaton town centre, there are a number of positives that we can communicate and work that may lay the foundation for further studies in the future. These are:

- A much greater understanding of flood risk in Nuneaton town centre and wider area
- Updated river flood modelling and associated reports, which will be used to update the external-facing EA Flood Map for Planning in the coming months, with many properties benefitting from a reduction in modelled flood risk
- Updated surface water flood mapping and associated reports, to complement the existing EA Risk of Flooding from Surface Water mapping
- Draft Outline Business Case and Economic Assessment for options that would remove flood risk from the town (reservoir option), for possible use/re-work in the future
- Economic Assessment and feasibility report for Property Flood Resilience within the town centre, for possible use/re-work in the future







Source: AECOM Preferred Option Summary, dated 23/03/2022

Where can I go for further information?

For any other queries on the content of this briefing note, please get in touch with Dan Lamb, Senior Flood Risk Management Engineer, on [redacted]

Anca Seaton

From: Keith Kondakor
Sent: 28 November 2023 12:50
To: Jacqueline Padbury
Subject: Re: Flood alleviation project

Yes there should be attachments form Jo's email to me. Will find and send directly

Sent from Outlook for Android

From: Jacqueline Padbury [redacted]
Sent: Tuesday, November 28, 2023 10:36:33 AM
To: Keith Kondakor [redacted]
Subject: FW: Flood alleviation project

Councillor Kondakor
Was there meant to be an attachment to this email?

Jacqui Padbury (MA MRTPI)
Principal Planning Policy Officer
[redacted]
Follow us: @nbbcouncil

From: Keith Kondakor [redacted]
Sent: Monday, October 16, 2023 7:09 PM
To: Planning Policy [redacted]
Subject: Re: Flood alleviation project

Please accept this as background evidence for my reg 19 replies.

Keith Kondakor

From: Joanne Pierson [redacted]
Sent: 28 September 2023 11:55

To: Keith Kondakor [redacted]
Subject: Flood alleviation project

Afternoon Councillor Kondakor

Please find attached a timeline and associated documents for the Flood Alleviation Project.

I will send a second email with another single attachment.

If you have any queries, please let me know.

Jo Pierson
Regeneration Monitoring and Evaluation Officer
[redacted]
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