Shipley and Canal Road Corridor Area Action Plan

Flood Risk Topic Paper (2016 Update)

Contents

1. Introduction

1.1 The City of Bradford Metropolitan District Council (the Council) are producing a new Local Plan for the Bradford District. The Shipley and Canal Road Corridor Area Action Plan (the AAP) is being produced as part of the Bradford District Local Plan. The AAP will guide the transformation of the Shipley and Canal Road Corridor (the Corridor) and facilitate the delivery of this key growth area. The National Planning Policy Framework (NPPF) (paragraphs 99-102) requires Local Plans to take account of flood risk by directing development away from areas at highest risk but where development is necessary making it safe without increasing flood risk elsewhere.

1.2 The Shipley and Canal Road Corridor Area Action Plan (SCRC AAP) identifies proposed site allocations for development within three Sub Areas. Sites outside the area covered by the SCRC AAP boundary will be allocated through the City Centre AAP and Allocations Development Plan Document and will be subject to a separate flood risk testing process.

1.3 In accordance with the NPPF, the SCRC AAP will seek to minimise flood risk by allocating land for development, to the greatest extent possible, within low risk areas. A Level 1 Strategic Flood Risk Assessment (SFRA) has been prepared by the Council to support the strategic approach to flood risk in the District. This identified that the SCRC AAP contains areas of land at risk of flooding, particularly along the Bradford Beck. A SFRA Level 2 has been prepared in order to provide a more detailed understanding of flood risk in the AAP area and to support the site allocation process in terms providing the evidence required to inform the Sequential and Exception Test.

1.4 The SFRA Level 1 recommends that a supporting stand alone document is prepared by the Council, which clearly records all decisions for each proposed development site (to avoid, substitute, control, mitigate) and the evidence that they used to make the decision. This should provide the evidence that the Sequential Test and Exception Test have been applied. This document sets out the Council's approach to taking flood risk into account in the preparation of the SCRC AAP.

1.5 This paper has been updated in December 2016 in response to representations made by the Environment Agency on the SCRC AAP and the updated Level 2 SFRA in respect to site DF9 and the assessment of proposed sites DF4/DF5 and DF9 following the December 2015 Boxing Day flood event.

2. Policy Context

National Planning Policy

2.1 The NPPF sets out how flood risk should be taken account of in the preparation of a Local Plan. NPPF Paragraph 100 sets out that 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:

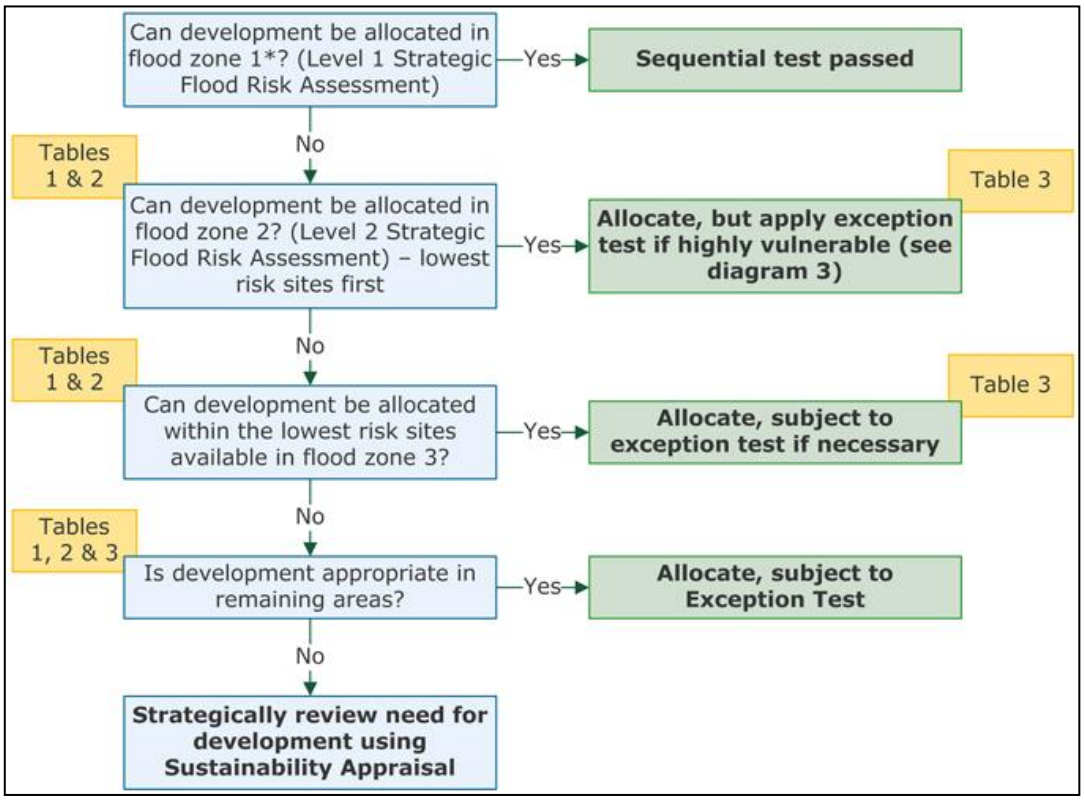
- applying the Sequential Test
- if necessary, applying the Exception Test
- safeguarding land from development that is required for current and future flood management

2.2 In relation to the latest national guidance for taking account of flood risk, the 'Technical Guidance to the NPPF (CLG, March 2012) was archived on the 7th March 2014 and has been superseded by the National Planning Practice Guidance (NPPG) on flood risk and coastal management.

Sequential Test

2.3 The Sequential Test is a decision making tool designed to ensure that areas at lower flooding are developed in preference to areas of higher risk. The NPPF states that 'the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding' (paragraph 101). Figure 1 (below) sets out how the Sequential Test should be applied when preparing a Local Plan.

Figure 1: Application of the Sequential Test for Local Plan preparation (taken from the National Planning Practice Guidance: Diagram 2)



2.4 The SFRA should be used as the basis for applying the sequential test and, where necessary, the Exceptions Test when determining land use allocations. The NPPG notes that where land outside flood risk areas cannot appropriately accommodate all the necessary development in an area, it may be necessary to increase the scope of the SFRA to provide the information necessary for application of the Exception Test, where appropriate.

Exceptions Test

2.5 The NPPF states that if, following application of the Sequential Test, it is not possible for development to be located in areas with a lower risk of flooding, the Exception Test can be applied if appropriate (Paragraph 102). 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 SFRA

● a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the 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.

2.6 Table 1 and Table 2 below set out flood risk vulnerability of different land use and flood zone compatibility used to inform application of the Exceptions Test.

Table 1: Flood risk vulnerability and flood zone 'compatibility' (taken from the NPPG : Table 3)

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Table 2: Flood Risk Vulnerability Classification

Essential Infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain

operational in times of flood.

- Wind turbines.

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are not required to be operational

during flooding.

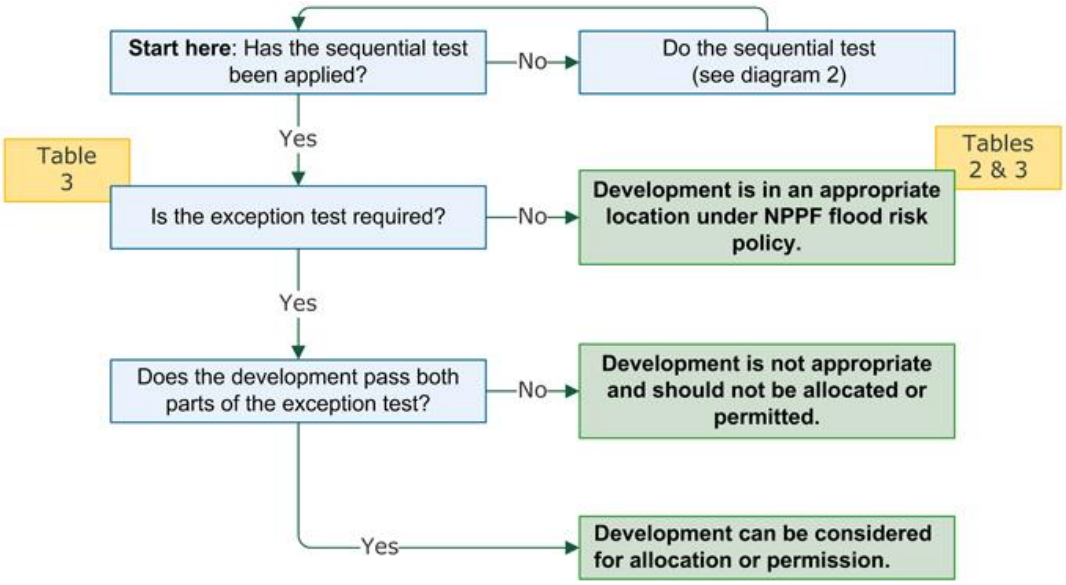
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the ‘More Vulnerable’ class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

2.7 Figure 2 (below) sets out how the Exceptions Test should be applied when preparing a Local Plan.

Figure 2: Application of the Exceptions Test for Local Plan preparation (taken from the National Planning Practice Guidance: Diagram 3)



Local Context

Bradford District Core Strategy

2.8 The Core Strategy sets out the broad aims and objectives for sustainable development within the Bradford District for the next 15 years until 2030. The Publication Draft of the Bradford District Core Strategy aims to provide for approximately 42,100 new homes in the District by 2030. The Shipley and Canal Road Corridor is identified as a key growth area in the Core Strategy and Urban Eco Settlement in the Leeds City Region.

2.9 The Core Strategy sets out strategic planning policies and key principles in relation to the approach to flood risk in the District. The Core Strategy identifies broad locations for growth, through settlement and area based targets, however the Core Strategy does not include site allocations. Further analysis and testing of individual sites in relation to flood risk will therefore be carried out as part of subsequent Development Plan Documents which allocate land.

2.10 Core Strategy Policy EN7 in the Environment section relates to flood risk. The policy was developed in the context of the information presented in the SFRA Level 1. It identifies a range of principles to be applied in managing flood risk within the District. These include integrating sequential testing into plan-making, protecting the functional floodplain, requiring space for the storage of flood water within Flood

Risk Zones 3a and 2 and supporting the provision of Sustainable Urban Drainage (SUDS). The emphasis on sequential testing is reinforced in the Housing Site Allocation Principles in Core Strategy Policy HO7, which states that a flood risk sequential approach will be applied to direct residential development to areas of lowest flood risk.

2.11 Flood risk is also identified as an important issue for the District in developing resilience to climate change, and this is recognised in both Core Strategy Policies SC2 and EN7.

Shipley and Canal Road Corridor AAP

2.12 The Shipley and Canal Road Corridor AAP is being produced as part of the Local Plan for the Bradford District. In accordance with the Core Strategy, the AAP will identify sites for over 3100 new homes by 2030. The Council consulted on the AAP Issues and Options in 2013. Since the Issues and Options the Council have commissioned a SFRA Level 2 to provide further detailed evidence in relation to flood risk in the Corridor and to support the SCRC AAP Publication Daft.

Evidence Base

2.13 The Council has used the following evidence base in applying the Sequential Test and, where necessary, the Exception Test, to potential site allocations in the AAP:

- City of Bradford Metropolitan District Council Strategic Flood Risk Assessment Level 1 (2011, as amended 2014)
- City of Bradford Metropolitan District Council Level 2 Strategic Flood Risk Assessment (2015)
- 2016 Updated to Level 2 SFRA (2016) and Addendum to the Level 2 Strategic Flood Risk Assessment following the December 2015 Boxing Day flooding event (Appendix D).

City of Bradford Metropolitan District Council Strategic Flood Risk Assessment Level 1 (2011, as amended 2014)

2.14 In 2011 a Level 1 SFRA was undertaken by consultants JBA, covering the Bradford District. The updated SFRA Level 1 reflects the requirements of NPPF and supersedes the previous SFRA. The assessment used the Environment Agency Flood Zones, provided in June 2010. With agreement from the Environment Agency, the flood zones in the Bradford Beck area used in the SFRA analysis, have been produced for the Council using a more detailed model.

City of Bradford Metropolitan District Council Level 2 Strategic Flood Risk Assessment (2015) and Update 2016

2.15 Following initial screening of the emerging sites within the AAP at the Issues and Options Stage, a SFRA Level 2 was commissioned by the Council and undertaken by JBA Consulting covering the Shipley and

Canal Road Corridor and City Centre AAP areas. This Level 2 SFRA follows on from the Level 1 SFRA. The purpose of the Level 2 SFRA is to provide a more detailed assessment of all relevant sources of flood risk on key sites within the two AAP areas. The Level 2 SFRA has been prepared in accordance with current best practice as set out in the NPPF and the Flood Risk and accompanying Coastal Change NPPG.

2.16 The outputs from the Bradford Beck Modelling Study (October 2013), have been used to assess fluvial risk from the Beck, as opposed to the Environment Agency Flood Map for Planning. The Bradford Beck model takes account of the sewer system and the impact of the flood relief diversion channels. The outputs from the Upper Aire Modelling Study, 2005, along with Flood Zone 2 and 3 of the Flood Map for Planning have been used to assess fluvial risk in Shipley, north of Dockfield Road where the Bradford Beck model study ends. Neither model has been amended nor updated further as part of the Level 1 SFRA.

2.17 The L2 SFRA has been updated in 2016 following the December 2015 Boxing Day flood event and in response to representations made by the Environment Agency on the SCRC AAP Publication Draft in regards to site DF9.

City of Bradford Metropolitan District Council Level 2 Strategic Flood Risk Assessments DF4/DF5 & DF9 Addendum (2016) Appendix D

2.18 This assessment provides a qualitative desk based re-assessment to flood risk of the SCRC AAP development sites DF4/DF5 and DF9 with regards to the draft flood mapping extents for the December 2015 Boxing Day flooding event. This is provided as an addendum to the Level 2 Strategic Flood Risk Assessment for the Area Action Plan completed in August 2015.

3. Taking Account of Flood Risk within the AAP

3.1 The SFRA Level 1 illustrates the process of taking account of flood risk within Development Plan Documents and the use of SFRAs. This divides the process into four stages:

1. Strategic Sequential Test
2. Development Site Sequential Test
3. Likelihood of Passing Exception Test
4. Producing an Evidence Base

3.2 The SFRA Level 1 includes a Sequential and Exception Test Flow Diagram setting out the recommended approach when applying the two tests. This approach is set out in Figures 3 and 4 (below).

Figure 3: Sequential and Exception Tests key steps (taken from SFRA L1 2014)

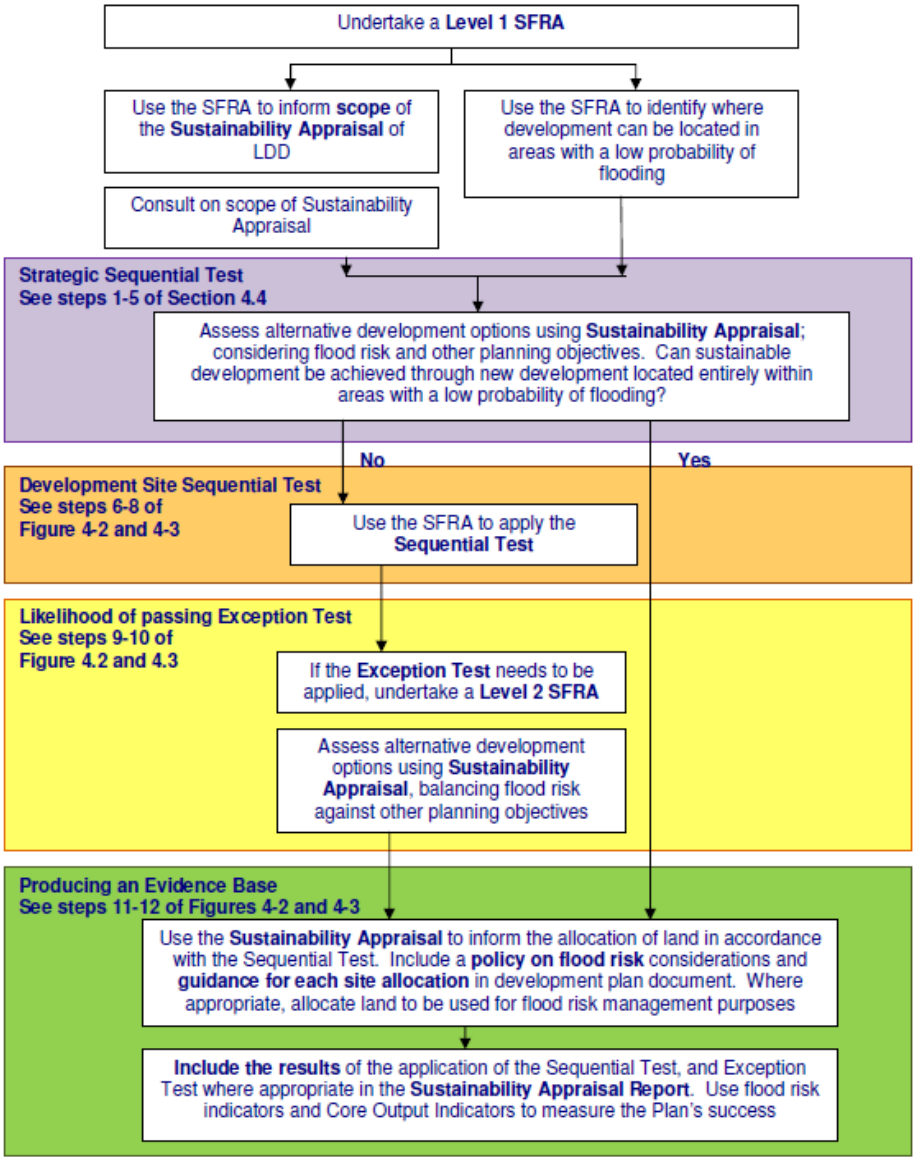
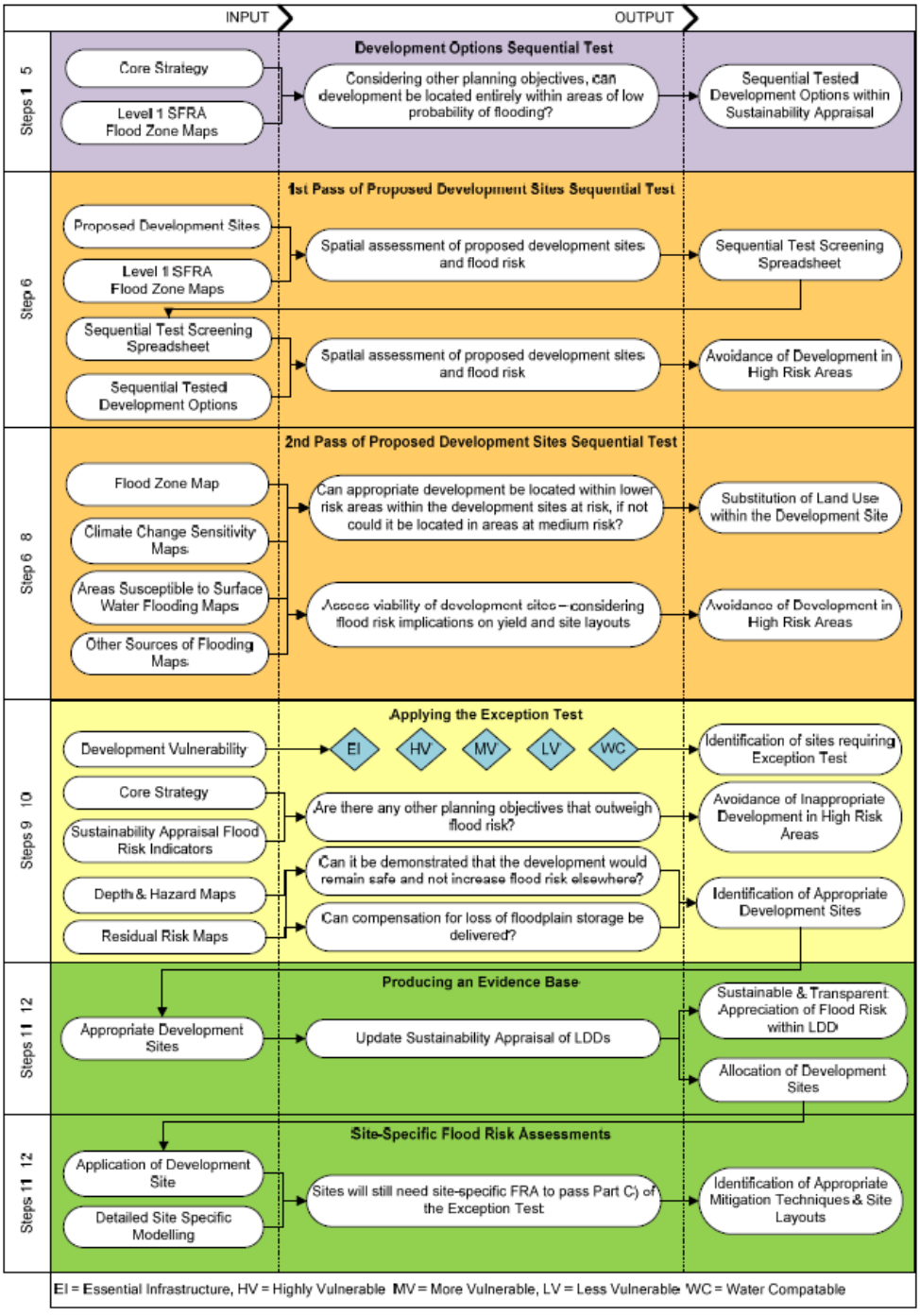


Figure 4: Sequential and Exception Test Flow Diagram (taken from SFRA L1 2014)



3.3 The SFRA Level 1 also identifies the key steps to be taken when applying the sequential and exceptions tests as part of producing Development Plan Documents (Figure 5). The following sections of this paper set out how flood risk has been considered in proposing allocations in the SCRC AAP based on the key steps identified in the SFRA Level 1 and the NPPG.

Figure 5: Sequential and Exception Test Key Steps (taken from SFRA L1 2014)

Applying the Sequential Test

Step 1 State the **geographical area** over which the Sequential Test is to be applied. This can be over the entire LPA area but will usually be reduced to communities to fit with functional requirements of development or objectives identified in DPD

Step 2 Identify reasonably available areas of strategic growth/ sites

Step 3 Identify the presence of **all sources of risk** using the evidence provided in this SFRA

Step 4 **Screen available land** for development in ascending order from Flood Risk Zone 1 to 3, including the subdivisions of Flood Risk Zone 3

This can be achieved using the information in a spatial assessment of each proposed development site provided by the LPA against Flood Zones and Environment Agency surface water susceptibility zones

Step 5 Could all development be located in lower risk areas? If not, move onto the next Steps

1st and 2nd Pass of the Proposed Development Sites Sequential Test

Follow Figure 5-4 to:

Step 6 Identify those sites which should be **avoided** where risk is considered too great and there are no critical planning objectives identified in DPD

Step 7 Identify those sites in which the consequence of flooding can be reduced through **substitution** within the site boundary

Step 8 Assess yield and layout issues for remaining high risk sites to check whether development is viable

Identify the Likelihood of passing the Exception Test

Follow Key Questions imbedded within Figure 5-5 and SFRA evidence to identify the likelihood of those sites remaining at risk passing the Exception Test.

Step 9 Assess the compatibility of the **development vulnerability** using Table 2 of NPPF technical guidance and identify the requirement of passing the **Exception Test** using Table 3 of NPPF technical guidance

Step 10 Use the SA to assess alternative development options by balancing flood risk against other planning constraints. Proposed sites should be avoided and removed if it is unlikely to pass the Exception Test i.e. if:

key Questions in Figure 5-5 suggest significant problems

development will require significant mitigation measures to make the site safe and to reduce impacts downstream

the requirement to provide floodplain compensation cannot be delivered

Producing an Evidence Base

The following steps should be used to produce the evidence that all Tests have been applied

Step 11 Produce a supporting stand alone sequential testing document recording all decisions made during Steps 1 to 10. Each proposed development site should be referenced and the decisions made to avoid, substitute, or allocate the site and the evidence used. This can be incorporated within the appendix of the SA

Step 12 Allocate development allocations within the DPD, including appropriate flood risk policies and development guidance on each allocated site. Guidance should include the need for appropriate site-specific FRAs.

The Environment Agency and other relevant stakeholders (such as Yorkshire Water or British Waterways) should be consulted on any policies drafted that inform the application of the Exception Test and the production of FRAs within the LPA area

4. Applying the Sequential Test

Background

4.1 The NPPG advises that the overall aim of the sequential test should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should decision-makers consider the suitability of sites in Flood Zone 3, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

Geographical Area (Figure 5, Step 1)

4.2 The NPPG sets out that the Sequential Test should be applied to the whole local planning authority area to increase the possibilities of accommodating development which is not exposed to flood risk. In accordance with the NPPG and SFRA Level 1 a strategic sequential flood risk test has been undertaken across the District as part of the Core Strategy.

4.3 Following on from the Strategic Sequential Test undertaken as part of the Core Strategy, a Sequential Test has also been undertaken on sites within the SCRC AAP boundary. This approach is in accordance with the SFRA Level 1, which states that the geographical area on which the sequential is undertaken will usually be reduced from the entire local authority area to fit with functional requirements of development or objectives identified in Development Plan Documents. Given that the strategic sequential test was undertaken on a District-wide basis and concluded that, due to wider sustainability benefits, development could not entirely be located in lower flood risk areas, it is considered appropriate to carry out the development sites Sequential Test within the AAP boundaries of key regeneration priority areas. The AAP boundary has therefore been used to define the area of search to inform the sequential approach to allocating development sites in the AAP**.**

Identify reasonable areas of strategic growth/sites (Figure 5, Step 2)

4.4 The strategic sequential test involved screening potential development sites within different settlements identified in the Strategic Housing Land Availability Assessment (SHLAA) against the SFRA Level 1 Flood Risk Zones to assess whether the level of development proposed in the Core Strategy could be accommodated in lower risk flood zones.

4.5 For the SCRC AAP the sequential test relates to all potential development sites identified in the SCRC AAP boundary. The

development sites assessed have been identified from the following sources:
• Site with planning permission
• Existing sites identified in the Replacement Unitary Development Plan (RUDP 2005) which remain available;
• Sites identified as part of the SHLAA and previous stages in preparation of the AAP;
• Other sites identified through masterplans and the SCRC Strategic Development Framework (2013).

No further land with development potential was identified in the SCRC area at the time the assessment was undertaken.

Sources of Flood Risk (Figure 5, Step 3)

4.6 Sources of flood risk across the District and within the SCRC have been identified through the SFRA Level 1and SFRA Level 2 and Addendum. In the Shipley and Canal Road Corridor, flood risk is mainly fluvial, from the Bradford Beck and River Aire. There are also areas of surface water flood risk within the SCRC.

Screen Available Land (Figure 5, Step 4)

4.7 Screening of the potential AAP sites has identified that there is land affected by proposed site allocations within the following Flood Risk Zones identified in the SFRA: 1, 2, 3a and 3b (see SFRA Level 1 and 2 for definitions). The screening of the AAP Issues and Options Sites is shown in Appendix A.

Can all development be located in lower flood risk areas? (Figure 5, Step 5)

4.8 The strategic screening of potential development sites against flood zones has identified that due to wider sustainability reasons, not all sites could be located in areas of lower flood risk based on the proposed Core Strategy housing distribution. This is set out in more detail in section 5 below.

4.9 Screening of the potential development sites identified in the SCRC APP Issues and Options stage indentified that further testing of the SCRC AAP development sites would be required (supported by a SFRA Level 2) as some of the sites included land within higher risk flood zones.

5. Strategic Sequential Flood Risk Test Summary (Figures 3, 4and 5, steps 1-5)

5.1 In accordance with the recommendations in the SFRA Level 1 the strategic options for the distribution of development across the District, as set out in the Core Strategy, were assessed in regards to flood risk

and the Sustainability Appraisal. This assessment considered the strategic distribution of development across the District against flood risk and other planning objectives and whether sustainable development could be achieved in the District through the Core Strategy by locating new development entirely within areas with a low probability of flooding.

5.2 The overriding aim of the Core Strategy has been to set settlement targets at a level that will allow the site allocations process to steer development to areas designated as flood zone 1. The exceptions to this approach are within Bradford City Centre and the Shipley and Canal Road Corridor were it was identified there is potential for new development to have an impact on flood risk and to be at risk of flooding.

5.3 Through the Core Strategy process it was considered that allocating additional development to other parts of the Regional City of Bradford, in order to avoid development within these areas of higher flood risk, would mean further increasing the proportion of land needed from the green belt. The Council therefore considered that this would be a less sustainable approach overall, when compared to the benefits of locating development in the Regional City of Bradford within the City Centre and Shipley and Canal Road Corridor. In addition it was also considered that accommodating development within the Canal Road Corridor and the City Centre would have significant investment and regeneration benefits.

5.4 Overall it was therefore considered through the Core Strategy that the wider sustainability benefits of an approach, which meets some of the economic and housing need of the Regional City of Bradford within these two key regeneration areas, significantly outweighed the flood risk issues in these areas.

5.5 Following on from the Strategic Sequential Test and screening of AAP sites, further detailed testing of potential sites within the AAP is required in regards to applying the sequential test and where necessary the exceptions test. This is set out below.

6. Development Sites Sequential Test (Figure 5, steps 6-8)

SCRC AAP Development Sites

6.1 The SCRC AAP will allocate land for a number of uses. This includes residential and mixed use development site allocations, with the breakdown of individual uses identified in AAP site proposal statements. The SFRA Level 2 provides a screening assessment of both fluvial and surface water flood risk to potential development sites in the SCRC AAP area. This is shown Appendix B of the SFRA Level 2 and in Appendix A of this report. The SFRA Level 2 Flood Risk Maps identify the proposed SCRC AAP sites together with all flood risk

information. Following the boxing day flood event in 2015 an addendum for the L2 DRFA was undertaken in regards to proposed AAP development sites which were impacted by this flood event. This is shown in Appendix C

Methodology

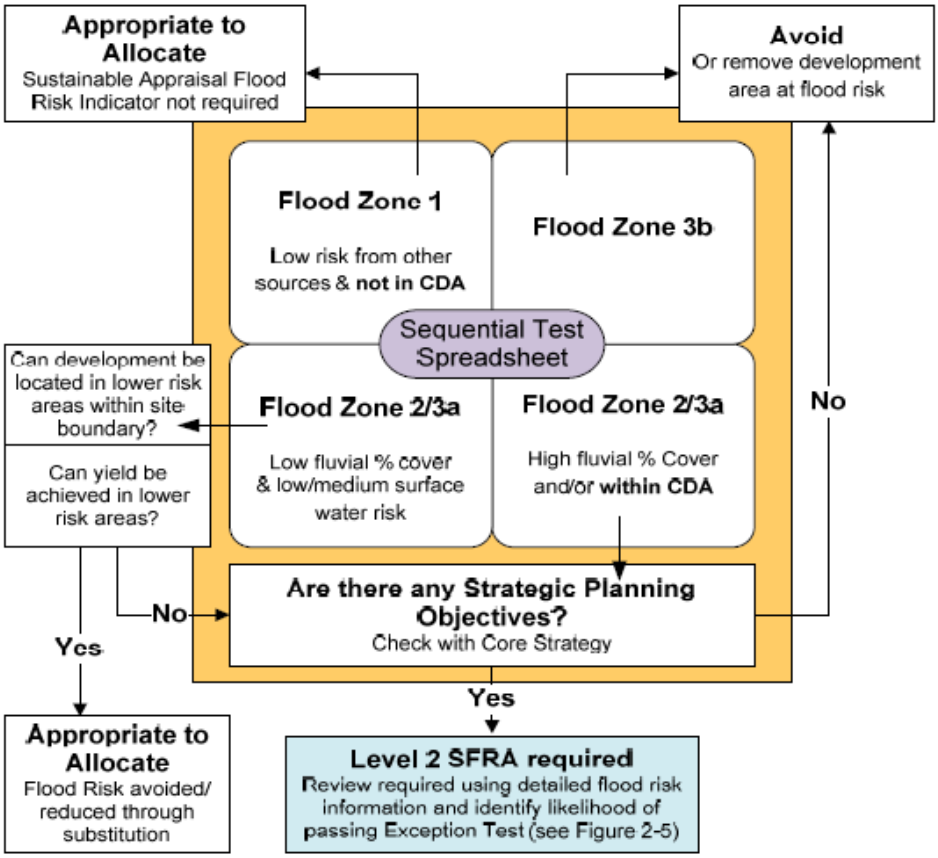
6.2 The SCRC AAP has requirements for the amount of land and number of units to be developed for residential use, which can be used as the basis for applying the sequential test. The following assumptions have been used when applying the sequential test.

Assumptions Used

- The SCRC AAP will provide a minimum of 3100 new homes over the plan period as set out in Policy HO3 and Policy BD1 of the Core Strategy;
- The SCRC AAP net housing target factoring in projected losses to the existing housing stock from clearance is 3222 new dwellings
- The SCRC AAP will contribute to land for employment uses within the City of Bradford as set out in Policy EC3 of the Core Strategy;
- Land with extant planning permission for the uses being assessed will not fail the sequential or exception test as flood risk matters have already been considered and mitigation measures agreed as part of the site-specific flood risk assessment required as part of the planning application.

6.3 The tests relate to all development sites considered as part of the SCRC AAP Publication Draft document. The test is based on the Application of the Sequential Test for Local Plan Preparation (Figure 1) and SFRA Level 1 proposed development sites sequential test approach (Figure 6 below)

Figure 6: Proposed development sites sequential test approach (Taken from SFRA Level 1 2014)



Sequential Test Results

6.4 The assessment includes development sites in Flood Zones 1, 2 and 3. The following sequential test considers the proposed development sites in sequence. Appendix B sets out details of the site specific sequential test. All flood risk zones applying to sites are identified with the percentage stated in Appendix A Table 4, where the site is within more than one zone. The tables below summarise the results of the AAP development sequential test.

CAN DEVELOPMENT BE ALLOCATED IN FLOOD ZONE 1?

PROPOSED DEVELOPMENT IN FLOOD ZONE 1 – 'LOW PROBABILITY' OF FLOOD RISK

The SCRC AAP includes the following proposed residential and mixed use sites in Flood Zone 1:

- STC1 Shipley Indoor Market Hall
- STC2 Land and Buildings Around Market Square
- STC3 Station Road
- STC4 Shipley Gateway Site
- STC5 Atkinson Street
- STC6 Buildings Along Briggate
- DF1 Lexicon Banksite Dock Lane
- DF3 Land Between Leeds Road and Dock Lane
- DF6 Regent House
- DF8 Dock Lane
- SE2 Land Around Crag Road Flats
- NBW2 Frizinghall Road
- NBW3 Thornhill Avenue
- NBW4 Bolton Hall Road
- NBW 6 North Queens Road
- NBW7 Livingstone Road Flats
- BWQ Bolton Woods Quarry
- CCF1 Bolton Road Wapping
- CCF2 Bolton Road

These proposed allocations satisfy the flood risk sequential test and are considered appropriate, subject to consideration of risk from other sources of flooding

PROPOSED DEVELOPMENT IN FLOOD ZONE 1 – 'LOW PROBABILITY' OF FLOOD RISK (With areas at risk from surface water)
The SCRC AAP includes the following proposed residential sites in Flood Zone 1: • DF7 Junction of Dock Lane and Dockfield Road • CCF3 Wapping Road, Bolton Road **These proposed allocations satisfy the flood risk sequential test and are considered appropriate, subject to consideration of risk from other sources of flooding**

CAN DEVELOPMENT BE ALLOCATED IN FLOOD ZONE 2?

PROPOSED DEVELOPMENT IN FLOOD ZONE 2– MEDIUM PROBABILITY' OF FLOOD RISK
The SCRC AAP includes the following proposed residential site partly within flood zone 2: • DF9 Dockfield Road **This proposed allocation satisfy the flood risk sequential test and is considered appropriate, subject to consideration of risk from other sources of flooding**

CAN DEVELOPMENT BE ALLOCATED IN LOWEST RISK SITES IN FLOOD ZONE 3?

PROPOSED DEVELOPMENT WITH AREAS OF SITE WITHIN FLOOD ZONES 2 & 3
The SCRC AAP includes the following proposed residential and mixed use sites with areas within flood zones 2 and 3: • DF2 Junction Bridge • DF4/DF5 Dockfield Road North/South • SE1 Crag Road • NBW1 New Bolton Woods • NBW 5 Valley Road Flats **As set out in Appendix B, the housing and mixed use sites individually pass the sequential test because further land in Flood Risk Zone 2/3 is**

required to meet the housing requirement and net housing target for the SCRC AAP as set out in Core Strategy. All the sites contain brownfield land within a priority regeneration area and are sustainably located.

There is no clear justification for preferring one site over another in these circumstances, subject to each site satisfying the requirements of the flood risk exception test.

Sites SE1 and NBW1 have extant planning permissions which address detailed site specific flood risk matters.

Following the sequential test, Site DF4 has been combined with DF5 and estimated residential development capacity reduced, to enable development to be located in lower risk areas within the combined site boundary and reduce flood risk by substitution and avoidance.

These proposed allocations are therefore considered appropriate, (where proposed development safeguards the functional flood plain) subject to passing the exceptions test where necessary and consideration of risk from other sources of flooding.

The exception test set out in the NPPF and NPPG needs to be applied for land proposed for more vulnerable uses within Flood Zone 3

IS DEVLEOPMENT APPROPRIATE IN REMAINING AREAS?

PROPOSED DEVELOPMENT WITH AREAS OF SITE WITHIN FLOOD ZONES 3ai

The SCRC AAP includes the following proposed site in Flood Zone 3Aii (with more than 25% of the total site area in Zone 3Ai):

- CCF4- Singleton Street

The proposed site satisfies the flood risk sequential test because further land in Flood Risk Zone 3ai is required to meet the housing requirement and net housing target for SCRC AAP as set out in Core Strategy. The site is therefore considered appropriate, subject to passing the exceptions test where necessary and consideration of risk from other sources of flooding.

Site CCF4 has prior approval for conversion of office to residential use under permitted development supported by a site specific FRA which addresses detailed site specific flood risk matters

COULD THE DEVELOPMENT PROPOSALS FOR THE SITES IN ZONE 2, 3A AND 3ai ALTERNATIVELY BE LOCATED IN LOWER RISK FLOOD ZONES?

a) Alternative sites have been considered for their potential to contribute towards the AAP housing requirement. No other alternative sites for residential/mixed use have been identified within the AAP boundaries that are considered viable and deliverable alternatives.

b) explain why the proposals cannot be redirected to lower risk flood zones:

• All the development sites identified in lower risk flood zones have already

been proposed to be allocated for residential/mixed use.

• Rejecting potential development sites with areas in flood zones 2 & 3 would prejudice delivery of the Core Strategy housing target of over 3100 dwellings for the SCRC AAP

• Rejecting developable brownfield sites could result in sterilising their development potential, with the consequence that they remain derelict. This would present a negative impression of vacant land in prominent locations. Blighting the sites use for future development would significantly hinder regeneration of this area, which is identified in the Core Strategy as a regeneration priority area for the District.

Summary of SCRC AAP development sites sequential flood risk test (Figures 3, 4 and 5, steps 6-8)

6.5 The sequential flood risk test for potential residential and mixed use development sites in the SCRC AAP has demonstrated that sites in areas with higher flood risk are required in order to meet the Core Strategy housing target for the SCRC AAP and the sites identified in the tables above are therefore considered appropriate, subject to passing the Exceptions Test.

6.6 Following the sequential approach, site DF4 which was identified as a potential mixed use site (including residential uses) was not considered appropriate to allocate individually as the AAP housing requirement could be met from sites in areas of lower flood risk and the SFRA Level 2 identified the majority of the site would need to safeguard the functional flood plan. The SFRA Level 2 identifies that by combining the site with the adjacent site DF5, flood risk could be reduced by substituting more vulnerable uses for water compatible uses and flood risk management within the functional flood pain and by locating more vulnerable uses (residential) to lower risk areas. This approach would still allow the AAP housing target to be met and meet the strategic objective of bringing back into use vacant brownfield land, while reducing flood risk and avoiding the functional floodplain.

6.7 The 2016 Addendum to the L2 SFRA also included a recommendation supporting the continued amalgamation of Sites DF4 and DF5 which has formed one overall comprehensive site, now referred to as site ‘DF4/DF5’. The site is brownfield land (former factory now demolished) and is considered to perform poorly in regards to the attenuation properties of the hard standing which remains across the site. It is therefore recommended the northern part (formerly DF4) of the site is allocated for green infrastructure/open space for flood storage and mitigation or flood infrastructure within the SRCAAP. It is also recommended development on the southern part of the site (formerly Site DF5) is directed away from areas affected by the Boxing Day Flood Event. This approach is considered to allow for the comprehensive flood risk assessment across the entire site, and allow

for the effective delivery of green infrastructure / flood storage and housing in the Dockfield Road Mixed Use Area.

7. Applying the Exception Test

What is the Exception Test?

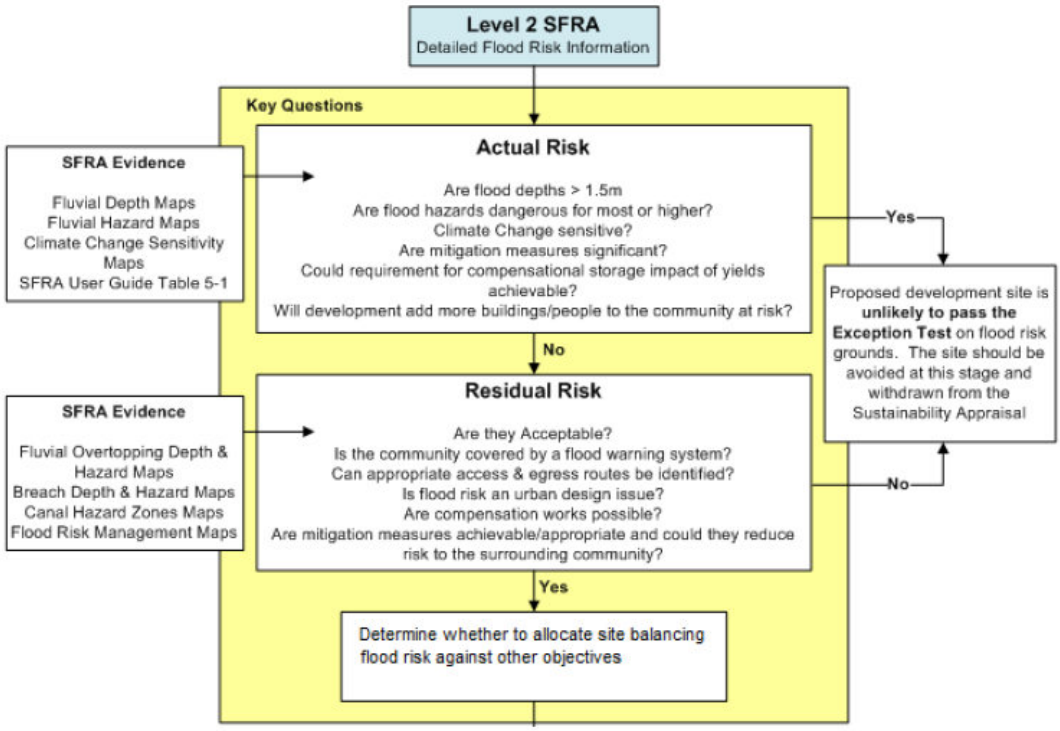
7.1 Having completed the Sequential Test, the Exception Test aims to provide a method of managing flood risk whilst still allowing necessary development to occur in the interests of sustainable development.

7.2 Paragraph 102 of the NPPF allows the application of the Exception Test where following application of the Sequential Test it is not possible, consistent with wider sustainability objectives, for development to be located in zones with a lower risk of flooding. The Exception Test therefore provides a method of managing flood risk while still allowing for development to occur where suitable sites at lower risk of flooding are not available.

7.3 There are two elements to the Exception Test as set out below. Both elements need to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; and
- A site-specific FRA must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.

Figure 7: Identifying the likelihood of passing the Exception Test (taken from the SFRA Level 1)



Flood Risk Vulnerability Classification

7.4 The NPPG sets out flood risk vulnerability classifications for various land uses as per Table 1 above. The classification acknowledges that not all land uses have the same vulnerability to flooding. Some land uses, such as residential developments, are more vulnerable to the potential loss of life and damage to personal property and possessions than retail or office developments for example.

7.5 By way of example, Table 1 shows that within Flood Zone 1 all land uses are acceptable as flood risk is not considered to be a significant constraint to development. However, a flood risk assessment will be required on sites 1ha+ which will need to consider other potential sources of flood risk, such as surface water. In Flood Zone 3a, potentially suitable land uses are water compatible (e.g. minerals development) and less vulnerable (e.g. employment uses). More vulnerable uses (e.g. residential) and essential infrastructure uses (e.g. transport infrastructure) should only be permitted in this zone if the

Exception Test is passed. Highly vulnerable development (e.g. caravans) should not be permitted in this zone.

8. Development Sites Exception Test

8.1 Following the application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for all the development in the SCRC AAP to be located in zones with a lower probability of flooding; the Exception Test will therefore need to be applied where appropriate.

8.2 Table 1, above, sets out the instances where an Exception Test will be required. As indicated in this table, it is necessary to apply the Exception Test when it is proposed to allocate a site in Flood Zone 3a for a “more vulnerable” use, such as residential development. An Exception Test is not required when a “less vulnerable” uses, such as offices, industry and storage or distribution uses, is proposed on a site in Flood Zone 3a.

8.3 The following proposed sites for residential and mixed use fall partly within Flood Zone 3a:

1. DF2 Junction Bridge
2. DF4/DF5 Dockfield Road North/Dockfield Road South
3. SE1 Shipley East
4. NBW1 New Bolton Woods
5. NBW 5 Valley Road Flats
6. CCF4 Singleton Street

8.4 These sites are considered to have passed the Sequential Test, but require an Exception Test for more vulnerable uses in accordance with paragraph 102 of the NPPF.

8.4 In addition, a site specific flood risk assessment is required as part of a planning application which will have to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. This could take the form of a sequential approach to layout of the site to ensure that the parts that flood to the deepest depths with the quickest inundation rates are avoided, or set aside for less vulnerable uses such as open space.

8.5 Measures are also taken to raise awareness and thereby reduce flood risk, for example, flood risk awareness and response campaigns informed by the Environment Agency’s Local Flood Warning Plan. Developments in high flood risk areas will be included in generic emergency response plans, including the multiagency flood plan and community emergency plans.

8.6 The notes and observation in the Exception Test should be read alongside the Strategic Flood Risk Assessment (Level 2).

Exception Test for Site DF2 Junction Bridge	
Flood Risk Zone: 7.7% of site in zone 3a, 20.4% in flood zone 2	
Proposed uses subject of Exception Test: Mixed use site, including residential uses	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: This brown field development site is located within Shipley town centre and close to Shipley railway station and high frequency bus routes. The site is part vacant, part in general industrial use. It is accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities. The site is also located in the Saltaire World Heritage Buffer Zone. Redevelopment of the site will be expected to safeguard and enhance the setting of Leeds and Liverpool Canal conservation area and key heritage assets including, grade 2 listed Junction Bridge and key unlisted building Junction House. Redevelopment of this part vacant site is considered likely to have positive impacts on the setting and key approaches to the World Heritage Site. Sustainability Appraisal site assessment: General positive scored for strengthening and sustaining a resilient local economy and ensuring local people have access to employment. Significant positive impacts for encouraging urban regeneration and reducing the need to travel and promoting sustainable transport modes. Significant negative impacts in terms of biodiversity, open space, health, proximity to listed buildings and reducing the risk of flooding, however the SA concludes that the site is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	• Bradford Beck runs along the western boundary of the site and the Leeds and Liverpool Canal along the northern edge. Fluvial flood risk occurs immediately along the western boundary from Bradford Beck with 28% of the site at risk. • Only 7.7% is within Flood Zone 3a which should be left free from the residential part of the development. If this is not

	possible following a sequential approach to site layout, then the second part of the Exception Test must be passed • Were any development to take place within Flood Zone 3a, a detailed evacuation plan would need to be developed and linked to relevant flood warning alerts. • Flood depths rarely exceed 0.25 m and the associated flood hazard is generally of low to moderate • Surface water risk is minimal though a site-specific FRA would be required to ensure criterion for safe development and flood risk management, including safe access and egress • The site is subject to a significant increase in risk due to climate change, based on comparison between Flood Zone 3a and the 1 in 100 +cc AEP event outline. As the site is at risk from Flood Zone 3a it should consider climate change in its mitigation strategies for development during the site planning stage. Any development within the 1 in 100 +cc AEP event outline should not reduce the available flood storage, though compensatory storage could be an option. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into Bradford Beck. The allowable rate of discharge will be based on the existing 1:2 year plus climate change event with a reduction of 30 percent that currently connects to the beck. If a connection does not currently exist into the beck, the maximum allowable discharge will be restricted to 2 litres/ second/ hectare ensuring flows and volumes of surface water are managed to greenfield runoff characteristics. Sustainable drainage principles should be incorporated into the new sites drainage system with caution that any above ground surface water attenuation systems should not prohibit the sites current flood storage capacity.
Conclusion	
Site DF2 is considered to pass the first part of the exceptions test and considered likely to pass the 2nd part of the exceptions test based on the SFRA Level 2 Subject to an FRA being submitted alongside detailed development proposals and demonstrating that the development will be safe and will not increase flood risk elsewhere, the proposed mixed use on site NBW1 is considered to have passed the Exception Test.	

Exception Test for Site DF4/DF5 Dockfield Road North/Dockfield Road South	
Flood Risk Zone: DF4- 12.3% in zone 3a 84.5, 2.03% in zone 3ai, 84.6% in zone 3b, DF5- 46.1% in zone 2, 3.2% in zone 3a	
Proposed uses subject of Exception Test: Mixed use site, including residential uses (90 units)	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: These vacant brown field development sites are located on the edge of Shipley Town centre in a highly accessible location, close to the railway station. The sites are accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities and open space and community

	facilities. The site is also located in the Saltaire World Heritage Buffer Zone. Redevelopment of these vacant sites is likely to have positive impacts on the setting of the World Heritage Site. Sustainability appraisal site assessment: Generally positive scores for meeting local housing needs, open space, improving health and helping to create and sustain safe, vibrant and cohesive communities. Significant positive impacts for encouraging urban regeneration, reducing the need to travel and promoting sustainable transport modes and strengthening and sustaining a resilient local economy and ensuring local people have access to employment. Significant negative impacts in terms of biodiversity, open space, reducing the risk of flooding, however the SA concludes that the site is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	Reason: • Mixed use development in Flood Zone 2 is permitted and as the site is small at under 1 ha (0.7 ha), there would not be a significant loss in floodplain. By combining sites DF4 and DF5 development can be directed to site DF5 with the higher risk DF4 site safeguarded for water compatible uses and for flood risk management, this approach will enable development the functional floodplain to be avoided. • Site-specific FRA would be required to ensure there would be no significant loss in floodplain that may increase risk upstream or downstream of the site. This may involve interrogation of the current Bradford Beck 2013 model to simulate floodplain loss scenarios. • This site should include open greenspace. This should be the preference for the area within Flood Zone 3a. Were any development to take place within Flood Zone 3, a detailed evacuation plan would need to be developed and linked to relevant flood warning alerts. • A site-specific FRA would be required to ensure criterion for safe development and flood risk management, including safe access and egress. Also, as the land is Brownfield, at a minimum, runoff should not exceed current rates • An option may be to review and update the 2005 Upper Aire model, through a detailed site-specific FRA, to assess whether the outputs may lower the risk to the site based on more up-to-date hydrological conditions and model

	components. Potential river modelling could assess the benefit of defences to the site with considerations as to whether the potential associated costs of defending the site would be justifiable when compared to the cost of development. • The DF5 site is subject to a significant increase in risk due to climate change, based on comparison between Flood Zone 3a and the 1 in 100 +cc AEP event outline. As the site is at risk from Flood Zone 3a it should consider climate change in its mitigation strategies for development during the site planning stage. Any development within the 1 in 100 +cc AEP event outline should not reduce the available flood storage, though compensatory storage could be an option. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into Bradford Beck. The allowable rate of discharge will be based on the existing 1:2 year plus climate change event with a reduction of 30 percent that currently connects to the beck. If a connection does not currently exist into the beck, the maximum allowable discharge will be restricted to 2 litres/ second/ hectare ensuring flows and volumes of surface water are managed to greenfield runoff characteristics. Sustainable drainage principles should be incorporated into the new sites drainage system with caution that any above ground surface water attenuation systems should not prohibit the sites current flood storage capacity.
Conclusion	
Site DF4/DF5 is considered to pass the first part of the exceptions test and considered likely to pass the 2nd part of the exceptions test based on the SFRA Level 2 Subject to an FRA being submitted alongside detailed development proposals and demonstrating that the development will be safe and will not increase flood risk elsewhere, the proposed mixed use on site NBW1 is considered to have passed the Exception Test.	

Exception Test for Site SE1 Shipley East	
Flood Risk Zone: 10.8% in flood zone 2, 6.6% in zone 3a, 9.5 in flood zone 3b	
Proposed uses subject of Exception Test: Mixed use site, including residential uses (101 units)	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: This mixed Greenfield/brown field development site is located in a highly accessible location adjacent Shipley railway station. It is accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities. The site is vacant, with the exception of an existing car repair business which would likely to be demolished/relocated during the redevelopment of the site. The site is located in the Saltaire World Heritage Buffer Zone on a key gateway to Shipley and the Saltaire World Heritage Site. Redevelopment of this large vacant and underused site is likely to

	have positive impacts on the setting and key approaches to the World Heritage Site and Shipley. The Bradford Beck and line of the former Bradford Canal run through the site, which forms the northern end of a strategic green corridor running from Bradford city centre to Shipley. Redevelopment of the site presents the opportunity for significant improvements to green infrastructure as part of the Linear Park including; protection and enhancement of green corridors and habitat networks alongside the Bradford Beck, the creation of new open space and wildlife areas and improvements to the quality and setting of Bradford Beck Sustainability appraisal site assessment: Generally positive scores for encouraging urban regeneration, health, open space, strengthening and sustaining a resilient local economy and ensuring local people have access to employment and helping to create and sustain safe, vibrant and cohesive communities. Significant positive scores in regards to reducing the need to travel and promoting sustainable transport modes, meeting local housing needs, strengthening and sustaining a resilient local economy and ensuring local people have access to employment. Significant negative in terms of biodiversity open space, noise, health and reducing the risk of flooding, however the SA concludes that the site is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	• Parts of the site are located n flood zones 2, 3a and 3b • The site area is 8 ha with 73% of the site footprint in Flood Zone 1, so it is considered practical that development is kept out of the functional floodplain using the sequential approach to site layout • Bradford Beck runs through the site meaning 9.5% of the site footprint is within the functional floodplain • 6.6% of the site is within Flood Zone 3a. The residential use of the development must pass the Exception Test in order to be permitted though the less vulnerable retail and business uses are permitted • A sequential approach to site layout should be followed with the aim of locating the residential units outside of Flood Zone 3a • as the site is currently predominantly greenspace, it is recommended that no development should take place within

	Flood Zone 3a to avoid floodplain losses. If this is not feasible then compensatory storage or increased conveyance would need to be found to offset the loss in floodplain. Compensatory storage could take place on-site due to the large area available and the proposed inclusion of GI • Any new development on the site would require the installation of SUDs, retention tanks and open greenspace. Redevelopment of the site would not increase flooding and likely reduce flood risk overall in the area. • Flood depths in some small pockets, particularly in the northern part of the site, within Flood Zone 3a can reach up to 1 m deep and the hazard rating can reach 'significant' levels • Surface water risk on-site is minimal. Given the large size of the site, consideration should be given to leaving the at risk areas as open space and incorporating appropriate SuDS techniques. Restrictions on surface water runoff from new development should be incorporated into the development planning stage. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into Bradford Beck. The allowable rate of discharge will be based on the existing 1:2 year plus climate change event with a reduction of 30 percent that currently connects to the beck. If a connection does not currently exist into the beck, the maximum allowable discharge will be restricted to 2 litres/ second/ hectare ensuring flows and volumes of surface water are managed to greenfield runoff characteristics. Sustainable drainage principles should be incorporated into the new sites drainage system with caution that any above ground surface water attenuation systems should not prohibit the sites current flood storage capacity. • A site-specific FRA was carried out for this site in September 2013. The FRA did not consider the functional floodplain as it had not yet been finalised through the Level 1 SFRA. The report did however state that all development would take place within zone 1 and zone 2 and therefore outside of zone 3. The FRA showed that development could proceed assuming finished floor levels, access roads and pedestrian walkways are set to appropriate minimum levels; and compensatory storage is provided in the southern end of the site. The FRA may have to be revisited and updated to show that the functional floodplain defined through this SFRA has been taken account of • The site is subject to a significant increase in risk due to climate change, based on comparison between Flood Zone 3a and the 1 in 100 +cc AEP event outline. As the site is at risk from Flood Zone 3a it should consider climate change in its mitigation strategies for development during the site planning stage. Any development within the 1 in 100 +cc AEP event outline should not reduce the available flood storage, though compensatory storage could be an option.
Conclusion	
Site SE1 is considered to pass the first part of the exceptions test and	

considered likely to pass the 2nd part of the exceptions test based on the SFRA Level 2 Site SE1 passes the Exception Test because it has planning permission. No further flood risk assessment would be needed provided the development is carried out in accordance with the permission. If the scheme is altered or reapplication made, a new Flood Risk Assessment (FRA) will be required taking account of the advice set out above.

Exception Test for Site NBW1 New Bolton Woods	
Flood Risk Zone: 8.3% in flood zone 2, 4.8% in flood zone 3a, 2.64% in flood zone 3b	
Proposed uses subject of Exception Test: residential led mixed use including residential uses (1100 units) and non–residential uses for health services, nurseries and educational establishments.	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: This is a large scale mixed brown field and greenfield development site located close to Frizinghall railway station. It is accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities. It is also located adjacent the Canal Road employment area which also provides significant local accessible job opportunities. The site contains areas open space, vacant/underused land and existing industrial buildings, which would likely be demolished and relocated during the redevelopment of the site. The transformational regeneration of the site will significantly contribute to the Districts housing requirement and provide a range of new and improved shops, employment opportunities and sport recreation and community facilities for new and existing communities. The Bradford Beck and line of the former Bradford Canal run through the site, which forms the middle of a strategic green corridor running from Bradford city centre to Shipley. Redevelopment of the site presents the opportunity for significant improvements to green infrastructure as part of the Linear Park including; protection and enhancement of green corridors and habitat networks alongside the Bradford Beck, the creation of new open space and wildlife areas and improvements to the quality and setting of Bradford Beck. Sustainability appraisal site assessment: Generally positive scores for encouraging urban regeneration and health. Significant positive impacts in regards to reducing the need to travel and promoting sustainable transport modes, meeting local housing needs, improving the quality range and accessibility of community facilities and services, helping to create and sustain safe, vibrant and cohesive communities, strengthening and sustaining a resilient local economy and ensuring local people have access to employment. Significant negative impacts in terms of open space, heath and reducing the risk of flooding, however the SA concludes that the site

	is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	• This is a large site of 49 ha is proposed for a mixed use site of residential, employment, a school and playing fields. • Parts of the site are located in flood zones 2, 3a and 3b • The site as a whole has only 2.6% of its area within Flood Zone 3b, with under 5% within Flood Zone 3a and 8% within Flood Zone 2. 84% of the site is therefore within Flood Zone 1 and is therefore developable subject to a site-specific FRA. • Surface water risk is considered minimal. • In Flood Zone 2, only 'Highly Vulnerable' uses are required to pass the Exception Test and 'More Vulnerable' uses, such as dwelling houses are 'Appropriate' for siting within this zone, subject to a Flood Risk Assessment, • Flood Zone 3a is similar in its extent to Flood Zone 2 therefore it should be possible to include all risk areas within a Green Infrastructure corridor and still leave 84% of the site available for development. • A sequential approach to site layout should be followed with the aim of locating the residential units outside of Flood Zone 3a • If development can be directed away from the western boundary, out of the floodplain, then passing the second part of the Exception Test is likely. • Were any development to take place within Flood Zone 3a, a detailed evacuation plan would need to be developed and linked to relevant flood warning alerts. • flood depths could be significant due to climate change. As the site contains Flood Zone 3a it should consider climate change in its mitigation strategies for development during the detailed site planning stage. Any development within the 1 in 100 +cc AEP event outline should not reduce the available flood storage, though compensatory storage could be an option. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into Bradford Beck. The allowable rate of discharge will be based on the existing 1:2 year plus climate change event with a reduction of 30 percent that currently connects to the beck. If a connection does not currently exist into the beck, the maximum allowable discharge will be restricted to 2 litres/

	second/ hectare ensuring flows and volumes of surface water are managed to greenfield runoff characteristics. Sustainable drainage principles should be incorporated into the new sites drainage system with caution that any above ground surface water attenuation systems should not prohibit the sites current flood storage capacity. • Where development within flood zone 3 is proposed that requires re-profiling of the embankments of Bradford Beck and any other alterations to the existing areas of land shown to be at risk of flooding together with any other changes of levels proposed throughout the site, a detailed hydraulic flood modelling assessment should be carried out to establish the level of flood risk to the site and the surrounding area that would result from any re-profiling of Bradford Beck and any of its tributaries.
Conclusion	
Site NBW5 is considered to pass the first part of the exceptions test and considered likely to pass the 2nd part of the exceptions test based on the SFRA Level 2 Subject to an FRA being submitted alongside detailed development proposals and demonstrating that the development will be safe and will not increase flood risk elsewhere, the proposed mixed use on site NBW1 is considered to have passed the Exception Test. Site NBW1 passes the Exception Test because it has outline planning permission. Dependent on site layout, a Flood Risk Assessment (FRA) will be required for reserved matters in accordance with planning conditions taking account of the advice set out above.	

Exception Test for Site NBW5 Valley road Flats	
Flood Risk Zone: 10.9% in flood zone 2, 3.4% in flood zone 3a, 1.09% in flood zone 3b	
Proposed uses subject of Exception Test: Residential (30 units)	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: this brown field development site is located close Frizinghall railway station. It is accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities. It is also located close to the Canal Road Employment area which provides significant accessible job opportunities. The site has vacant existing residential flats which are likely to be cleared and demolished and redeveloped as part of the redevelopment of the site. Sustainability appraisal site assessment: Generally positive scores for meeting local housing need, health creating vibrant and cohesive communities and reducing the need to travel. Significant positive impact in regards to encouraging urban regeneration. Significant negative in terms of open space and reducing the risk of

	flooding, however the SA concludes that the site is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	• The site is 1.3 ha in size and currently supports several small blocks of flats with large surrounding grassed open areas • A nominal area of this site is within the functional floodplain (1%) and Flood Zone 3ai (0.1%) whilst only 3.4% is within Flood Zone 3a. Flood Zone 3a • flood depths rarely get above 0.5 m with hazard to people low to moderate. • If the site layout is to change, through demolition of the flats and the addition of new build housing, then the small area of functional floodplain must be left as open space. • The recommendation would also be to ensure that Flood Zone 3a is left undeveloped otherwise the Exception Test must be passed for development in this area. • Were any development to take place within Flood Zone 3a, a detailed evacuation plan would need to be developed and linked to relevant flood warning alerts • A further option would be to demolish the flats and not rebuild within Flood Zone 3a. This would result in a return of part of the site to natural floodplain which may cause a reduction in risk downstream. • A site-specific FRA would be required to assess options. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into the public sewerage network. In bringing the site forward it would therefore be necessary to restrict the peak surface water discharge rate to the existing 1:2 year plus climate change event with a reduction of 30 percent.. The management of surface water discharges in this way will reduce flood risk to new and existing development downstream. Carefully planned use of sustainable drainage systems within the site are essential to play a role in achieving reduction to the amount of properties and infrastructure that are directly at risk from surface water flooding in the city centre.
Conclusion	
Site NBW5 is considered to pass the first part of the exceptions test and considered likely to pass the 2nd part of the exceptions test based on the SFRA Level 2. Subject to an FRA being submitted alongside detailed development proposals	

and demonstrating that the development will be safe and will not increase flood risk elsewhere, the proposed residential use on site NBW5 is considered to have passed the Exception Test.

Exception Test for Site CCF4 Singleton Street	
Flood Risk Zone: 93.9% in zone 3ai	
Proposed uses subject of Exception Test: Residential (60 units)	
A: Does the development provide wider sustainability benefits to the community that outweigh flood risk?	
Yes	Reason: This brown field development site is located on the edge of the city centre and close Forster Square railway station. The site is Accessible by a number of sustainable transport modes to a wide range of employment, shopping and leisure opportunities. It is also located within the Valley Road Retail area which provides significant accessible job opportunities. The site contains vacant office building which is likely to be converted as part of the redevelopment of the site. Sustainability appraisal site assessment: Generally positive scores for meeting local housing need and reducing the need to travel. Significant positive in regards to encouraging urban regeneration , helping to create and sustain safe, vibrant and cohesive communities, strengthening and sustaining a resilient local economy and ensuring local people have access to employment Significant negative in terms of reducing the risk of flooding, however the SA concludes that the site is appropriate to allocate as the policies in the AAP/Core Strategy would ensure likely significant adverse effects would be fully assessed and appropriate measures could be identified to mitigate these impacts. The SA notes the site would require a Flood Risk Assessment to ascertain site specific flood risk issues and identify flood risk mitigation measures. Therefore it the SA considers that development could be directed to those parts of the site not at risk of flooding or through the implementation of appropriate mitigation could reduce the potential for flooding.
B: Has a FRA demonstrated that the development will be safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall?	
Yes	• This site is 0.39 ha in size and contains a vacant office building, including a car park, • The site is located in flood zone 3ai with 4.3% of the site in flood zone 3a • This site has previously been granted prior approval for change of use to residential under permitted development in 2013, supported by a site-specific FRA,. • In order to allocate, the AAP should include a requirement in the site allocation statement that the measures detailed in the FRA are implemented to ensure the development and occupants are safe from flooding, in accordance with EA recommendations.

	• These measures include the identification and provision of safe route(s) into and out of the site to an appropriate safe haven; and the implementation of flood mitigation measures on the ground floor. • The EA recommend that flood proofing and mitigation measures are applied up to 600 mm above ground levels. • In line with normal practice, if infiltration methods are not practical, surface water will be required to discharge into Bradford Beck. The allowable rate of discharge will be based on the existing 1:2 year plus climate change event with a reduction of 30 percent that currently connects to the beck. If a connection does not currently exist into the beck, the maximum allowable discharge will be restricted to 2 litres/ second/ hectare ensuring flows and volumes of surface water are managed to greenfield runoff characteristics.
Conclusion	
Site NBW5 is considered to pass the first part of the exceptions test. Site CCF4 passes the Exception Test because it has prior approval for change of use under permitted development supported by a site specific Flood Risk Assessment. No further flood risk assessment would be needed provided the development is carried out in accordance with the FRA. If the scheme is altered or reapplication made, a new Flood Risk Assessment (FRA) will be required taking account of the advice set out above.	

Appendix A: SCRC AAP Development site flood risk screening

Table 3: Screening of SCRC Issues and Options sites against SFRA 1 Flood Risk Zones

Sub Area	Site Ref	Existing use	Proposed use	Flood risk vulnerability category of proposed use	Increased flood risk vulnerability	SFRA L1 Flood Zone (Bradford Beck Model)				Surface water Flood risk	Comments	Sequential Test	Exception Test
					(Y= Yes N = No)	1	2	3	3b				
Shipley	STC1	Commercial	Mixed Use	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	STC2	Mixed Use	Retail led redevelopment	Less vulnerable	N	Y				N	LV in Zone 1 with no other source of flood risk	Appropriate to allocate	Not required
	STC3	Residential and commercial	Mixed Use	More vulnerable/ less vulnerable	N	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	STC4	Commercial	Retail and Leisure	Less vulnerable	N	Y				Y (0.1m)	LV in Zone 1 with risk of surface water	Appropriate to allocate	Not required
	SE1	Greenfield	Residential led mixed use	More vulnerable	Y	Y	Y	Y		Y (0.1 and 0.3m)	MV with areas of site in Zone 2 and 3. Increased vulnerability with surface water risk.	Further justification required through AAP/site specific sequential test	Level 2 SFRA required to inform Exceptions Test
	SE2	Station facilities	Station facilities	Essential infrastructure	N	Y	Y	Y		Y (0.1 and 0.3m)	EI with small area of site in Zone 2 and 3. Surface water risk	This is an existing site which will does not require an	This is an existing site which will does not require an

												allocation through the AAP therefore will not require sequential test	allocation through the AAP therefore will not require exceptions test
	SE3	Greenfield	Residential redevelopment	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	DF1	Business and greenfield	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	DF2	Industrial	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y	Y	Y		N	MV with areas of site in Zone 2 and 3.	Further justification required	Level 2 SFRA required to inform Exceptions Test
	DF3	Industrial	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	DF4	Vacant (former industrial)	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y	Y			N	MV with areas of site in Zone 2	Further justification required through AAP/site specific sequential test	Not required
	DF5	Vacant (fomer industrial)	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y	Y			Y (0.1 and 0.3m)	MV with areas of site in Zone 2 Surface water risk	Further justification required through AAP/site	Not required

												specific sequential test	
	DF6	Industrial	Residential redevelopment	More vulnerable	Y	Y				N	MV with no other source of flood risk	Appropriate to allocate	Not required
	DF7	Commercial	Business and residential mixed use	More vulnerable/ Less vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	DF8	Vacant (former leisure)	Mixed use redevelopment	More vulnerable/ Less vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
The Centre Section	NBW 1	Indstrial	Employment area	Less vulnerable	N	Y	Y			Y (0.1 and 0.3m)	LV with areas of the site in Zone 2. Surface water risk.	Further justification required through AAP/site specific sequential test	Not required
	NBW 2	Industrial and greenfield	Residential and open space	More vulnerable /water compatible	Y	Y				Y (0.1 and 0.3m)	MV/WC with increase in vulnerability and surface water risk.	Appropriate to allocate	Not required
	NBW 3	Greenfield	Residential and open space	More vulnerable /WC	Y	Y				Y (0.1 and 0.3m)	MV/WC in Zone 1 with increase in vulnerability and surface water risk.	Appropriate to allocate	Not required

	NBW 4	Industrial	Residential/employment and neighbourhood centre including; retail/community/health/ business/	More vulnerable/ Less vulnerable	Y	Y	Y			Y (0.1m)	MV/LV with area of the site in Zone 2 and Zone 3 (EA only) and suface water risk.	Further justification required through AAP/site specific sequential test	Not required
	NBW 5	Greenfield	Residential and open space	More vulnerable /Water compatible	Y	Y	Y			N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	NBW 6	Greenfield	Playing pitch and primary school/ residential	More vulnerable /Water compatible	Y	Y	Y			N	MV with areas of the site in Zone 2 and Zone 3 (EA only)	Further justification required through AAP/site specific sequential test	Not required
	NBW 7	Residential and greenfield	Residential redevelopment	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	NBW 8	Industrial and commercial	Residential	More vulnerable	Y	Y				Y (0.1 and 0.3m)	MV in Zone 1 with increase in vulnerability and surface water risk.	Further justification required	Not required
	NBW 9	Greenfield	Playing fields/all weather pitch and open space	Water Compatible	N	Y	Y	Y		Y (0.1m)	WC with areas of the site in Zone 2 and Zone 3.	Appropriate to allocate	Not required
	NBW 10	Residential and Industrial	Residential infill	More vulnerable	Y	Y				Y (0.1 and 0.3m)	MV in Zone 1 with increase in vulnerability and suface water risk.	Further justification required	Not required

	NBW 11	Greenfield	Residential and open space	More vulnerable /WC	Y	Y	Y	Y		Y (0.1m)	MV/WC with areas of site in Zone 2 and Zone 3 and suface water risk	Further justification required through AAP/site specific sequential test	Level 2 SFRA required to inform Exceptions Test
	NBW 12	Residential	Residential redevelopment	More vulnerable	N	Y	Y			N	MV with small area of site in Zone 2	Further justification required through AAP/site specific sequential test	Not required
	NBW 13	Industiral	Residential	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk.	Appropriate to allocate	Not required
	BWQ 1	Minerals Working	Residential redevelopment and open space	More vulnerable /WC	Y	Y				Y (0.1 and 0.3m)	MV/WC in Zone 1 with increase in vulnerability and suface water risk.	Appropriate to allocate	Not required
City Centre Fringe	BW1	Greenfield	Residential and Open Space	More vulnerable /WC	Y	Y				N	MV/WC in Zone 1 with no other source of flood risk	Appropriate to allocate	Not required
	BW2	Greenfield	Residential	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood risk	Appropriate to allocate	Not required
	BW3	Industrial	Residential	More vulnerable	Y	Y				N	MV in Zone 1 with no other source of flood	Appropriate to allocate	Not required

											risk		
	CR1	Vacant (industrial)	Employment	Less vulnerable	N	Y	Y			Y (0.1m)	LV with areas of the site in Zone 2 and Zone 3 (EA only). Surface water risk.	Further justification required through AAP/site specific sequential test	Not required
	VRA	Commercial	Edge of centre bulky goods	Less vulnerable	N	Y	Y	Y	Y	Y (0.1 and 0.3m)	LV with areas of the site in Zone 2 and Zone 3 and small area in flood zone 3b. Surface water risk.	Further justification required through AAP/site specific sequential test	Level 2 SFRA required to inform Exceptions Test

Table 4: Screening of SCRC AAP Publication Draft sites against L2 SFRA Flood Risk (taken from Appendix B SFRA Level 2 2016 update)

City of Bradford MDC Level 2 Strategic Flood Risk Assessment

SCRC Proposed Development Site Assessment

6th December 2016 (updated with details from addendum for DF9 and summary table and highlighted yellow)

The colour coding shows the highest risk element of the flood zone that is present on site and is not in itself an indication of whether the site should or shouldn't be developed for flooding reason

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Key

- Flood Zone 3b
- Flood Zone 3ai
- Flood Zone 3a
- Flood Zone 2
- Flood Zone 1 + Surface Water
- Flood Zone 1

Summary Table

			Flood Zone Coverage										updated Flood Map for Surface Water					
			Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3ai		Flood Zone 3b		1 in 30 year		1 in 100 year		1 in 1000 year	
	Number of Sites	Area (ha)	Area (ha)	No. 100%	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.
Residential	18	39.78	39.09	15	0.20	4	0.06	2	0.37	2	0.01	1	0.23	7	0.39	11	1.24	13
Mixed use	11	64.38	53.33	6	5.46	5	3.04	5	0.01	2	2.54	3	1.38	7	1.19	10	7.47	10
TOTAL	**29**	**104**	**92**	**21**	**6**	**9**	**3**	**7**	**0**	**4**	**3**	**4**	**2**	**14**	**2**	**21**	**9**	**23**

Main Table

					Flood Zone Coverage										updated Flood Map for Surface Water						
					Flood Zone 1		Flood Zone 2		Flood Zone 3a		Flood Zone 3ai		Flood Zone 3b		1 in 30 year		1 in 100 year		1 in 1000 year		
Site Reference	Name	Area of Opportunity	Proposed Use	Area (ha)	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%	Development Viability
BWQ	Bolton Woods Quarry	New Bolton Woods	Residential	29.33	29.33	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.07	0.22	0.39	1.31	Development should be permitted subject to site-specific FRA
CCF1	Bolton Road Wapping	City Centre Fringe	Residential	1.16	1.16	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted subject to site-specific FRA
CCF2	Bolton Road	City Centre Fringe	Residential	0.17	0.17	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	3.99	Development should be permitted
CCF3	Wapping Road, Bolton Road	City Centre Fringe	Residential	0.46	0.46	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	4.46	0.10	21.27	Development should be permitted subject to site-specific FRA
CCF4	Valley Road Retail area	City Centre Fringe	Residential	0.39	0.00	0.00	0.01	1.78	0.02	4.33	0.37	93.89	0.00	0.00	0.08	19.26	0.17	41.83	0.15	38.91	Extant planning permission supported by site-specific FRA
DF1	Lexicon Bankside Dock Lane	Shipley	Mixed use	2.01	2.01	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.52	0.04	1.85	0.06	2.99	Development should be permitted subject to site-specific FRA
DF2	Junction Bridge, Briggate	Shipley	Mixed use	0.75	0.54	71.89	0.15	20.39	0.06	7.72	0.00	0.00	0.00	0.00	0.00	0.23	0.01	1.85	0.15	20.33	Exception Test likely, depending on site layout
DF3	Land between Leeds Road and Dock Lane	Shipley	Mixed use	0.71	0.71	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.20	0.03	4.43	Development should be permitted
DF4	Dockfield Road North	Shipley	Mixed use	0.57	0.00	0.00	0.01	1.08	0.07	12.32	0.01	2.03	0.48	84.57	0.00	0.01	0.00	0.10	0.09	16.71	Development unlikely
DF5	Dockfield Road South	Shipley	Mixed use	0.69	0.34	50.27	0.32	46.07	0.02	3.20	0.00	0.47	0.00	0.00	0.00	0.32	0.03	4.46	0.37	54.29	Exception Test likely, depending on site layout
DF6	Regent House	Shipley	Residential	0.69	0.69	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.06	8.78	Development should be permitted
DF7	Junction of Dock Lane and Dockfield Road	Shipley	Residential	0.06	0.06	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	48.48	Development should be permitted subject to site-specific FRA
DF8	Dock Lane	Shipley	Residential	0.15	0.15	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted
DF9	Dockfield Road	Shipley	Residential	0.13	0.078	60%	0.052	40%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted subject to site specific FRA
NBW1	New Bolton Woods 1	New Bolton Woods	Mixed use	49.29	41.54	84.27	4.11	8.34	2.35	4.77	0.00	0.00	1.29	2.62	0.85	1.72	0.65	1.31	5.15	10.44	Exception Test likely, depending on site layout
NBW2	Frizinghall Road	New Bolton Woods	Residential	0.75	0.75	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	8.59	0.02	3.02	0.05	6.37	Development should be permitted
NBW3	Thornhill Avenue	New Bolton Woods	Residential	0.60	0.60	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	8.56	0.03	4.40	0.03	5.46	Development should be permitted
NBW4	Bolton Hall Road	New Bolton Woods	Residential	0.84	0.84	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	3.15	0.07	8.14	0.16	19.72	Development should be permitted
NBW5	Flats East Valley Road	New Bolton Woods	Residential	1.29	1.09	84.53	0.14	10.90	0.04	3.38	0.00	0.10	0.01	1.09	0.00	0.00	0.01	0.09	6.93	Exception Test likely, depending on site layout
NBW6	North Queens Road	New Bolton Woods	Residential	0.80	0.80	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.07	0.16	19.57	Development should be permitted
NBW7	Livingston Road Flats	New Bolton Woods	Residential	1.41	1.41	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted
SE1	Shipley East	Shipley	Mixed use	6.07	1.90	31.08	0.87	10.78	0.54	8.64	0.00	0.00	0.77	9.51	0.54	6.37	0.40	4.99	1.40	17.02	Development should be permitted subject to site-specific FRA
SE2	Land around Crag Road Flats	Shipley	Residential	1.21	1.21	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.21	0.01	1.18	Development should be permitted
STC1	Shipley Indoor Market Hall	Shipley	Mixed use	0.25	0.25	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	3.08	Development should be permitted subject to site-specific FRA
STC2	Land and buildings around Market Sq	Shipley	Mixed use	1.43	1.43	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	2.85	0.18	12.28	Development should be permitted
STC3	Station Road	Shipley	Residential	0.32	0.32	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted
STC4	Shipley Gateway Site	Shipley	Mixed use	0.48	0.48	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	3.81	0.03	5.34	Development should be permitted
STC5	Atkinson street	Shipley	Residential	0.02	0.02	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted
STC6	Buildings along Briggate	Shipley	Mixed use	0.13	0.13	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Development should be permitted

*this table includes the list of potential development sites identified for the SCRC Publication Draft. It should be noted that the table is not directly comparable to the Table 3 Screening of SCRC Issues and Options Sites as this table includes additional sites and updated site boundaries and site references

APPENDIX B: DETAILED FLOOD RISK SEQUENTIAL TEST FOR THE POTENTIAL SITES IDENTIFIED IN THE SCRC AAP PUBLICATION DRAFT

The assessment details the process used to undertake the sequential test for the SCRC AAP. The assessment focuses on the following principal uses which formed the basis of the proposed allocations:
• Residential and mixed use
• Other uses proposed/acceptable on specific sites (retail, leisure, education uses, hotel)

The process adopts the principle set out in the NPPF (paragraph 100 to 101) which advises that LPAs should use the sequential test to “steer new development to areas with the lowest probability of flooding.”

It takes account of specific requirements set out for the AAP in the Bradford Core Strategy over the plan period as follows:

- Over 3100 new homes (Policy HO3, Policy BD1)
- Other uses have no specific area requirement, but reference is made to the need for retail, employment uses and community uses to support new development in the area under Core Strategy Policies BD1, EC3 and EC5.

The sequential test is set out as a series of steps undertaken in accordance with Diagram 2 of the NPPG Flood Risk Guidance. Sites are discounted in order of their risk of flooding (lowest flood zone 1 sites first) until the assumed requirement is met. Following this process, any uses identified in the higher risk flood zones are assessed against Table 3 in the NPPG Flood Risk Guidance.

Uses in the higher risk flood zones which are not deemed appropriate by Table 3 and which are not needed to meet the requirement for that use fail the sequential test. Sites which may be needed to meet a requirement for a particular use, but are not deemed to be appropriate by Table 3, either require an Exception Test to be undertaken or are deemed inappropriate depending on the Flood Risk Zone the site is located within and the level of vulnerability of the proposed use.

CAN DEVELOPMENT BE ALLOCATED IN FLOOD ZONE 1?

1. Identified residential (and mixed use) sites located in flood zone 1.

A number of the potential residential or mixed use (which include residential) sites in the AAP are located in flood zone 1, having a less than 0.1% annual probability of flooding. As such, these sites are sequentially preferred in the NPPF. These sites are the first sites to be deducted from the AAP requirement. The results are set out in the table below:

Site Reference	Site name	Site Area (ha)	Proposed Use	Dwellings	Flood Zone	Results of Sequential Test
AAP Dwelling Requirement				**3100**		
STC1	Shipley Indoor Market Hall	0.18	Mixed use	20	Zone 1	Appropriate to allocate
STC2	Land and Buildings Around Market Square	1.1	Mixed use	25	Zone 1	Appropriate to allocate
STC3	Station Road	0.4	Residential	50	Zone 1	Appropriate to allocate
STC4	Shipley Gateway Site	0.8	Mixed use	50	Zone 1	Appropriate to allocate
STC5	Atkinson Street	0.02	Residential	8	Zone 1	Appropriate to allocate
STC6	Buildings Along Briggate	0.21	Mixed use	20	Zone 1	Appropriate to allocate
DF1	Lexicon Banksite Dock Lane	2.01	Residential led mixed use	114	Zone 1	Appropriate to allocate
DF3	Land Between Leeds Road and Dock Lane	0.6	Residential/ mixed use	60	Zone 1	Appropriate to allocate
DF6	Regent House	0.69	Residential	93	Zone 1	Appropriate to allocate
DF7	Junction of Dock Lane and Dockfield Road	0.05	Residential	4	Zone 1	Appropriate to allocate
DF8	Dock Lane	0.15	Residential	15	Zone 1	Appropriate to allocate
SE2	Land Around Crag Road Flats	0.29	Residential	30	Zone 1	Appropriate to allocate

NBW2	Frizinghall Road	0.8	Residential	42	Zone 1	Appropriate to allocate
NBW3	Thornhill Avenue	0.6	Residential	21	Zone 1	Appropriate to allocate
NBW4	Bolton Hall Road	0.83	Residential	35	Zone 1	Appropriate to allocate
NBW 6	North Queens Road	0.8	Residential	30	Zone 1	Appropriate to allocate
NBW7	Livingstone Road Flats	1.4	Residential	70	Zone 1	Appropriate to allocate
BWQ	Bolton Woods Quarry	28.7	Residential	1000	Zone 1	Appropriate to allocate
CCF1	CCF2 Bolton Road	2.11	Residential	46	Zone 1	Appropriate to allocate
CCF2	Bolton Road	0.31	Residential	16	Zone 1	Appropriate to allocate
CCF3	Wapping Road, Bolton Road	0.46	Residential	23	Zone 1	Appropriate to allocate
Total Dwellings				**1772**		
Remaining AAP housing requirement to find				**1328**		

The potential residential and mixed use allocations in flood zone 1 can provide an estimated capacity of 1772 dwellings. When these sites are discounted from the AAP total requirement, there remains a shortfall 1328 dwellings. Therefore further sites will be needed to accommodate the AAP housing requirement.

CAN DEVELOPMENT BE ALLOCATED IN FLOOD ZONE 2?

2. There are no identified residential (and mixed use) sites located entirely in flood zone 2. Site DF9 is partially located in flood zone 2.

Site Ref	Site name	Site Area (ha)	Proposed Use	Dwellings	% in zone 2	% in zone 3a	% zone 3b	Results of Sequential Test
Remaining AAP balance carried forward				**1328**				
DF9	Dockfield Road	0.13	residential	10	40	0	0	Appropriate to allocate
Total dwellings				**1782**				
Remaining AAP housing requirement to find				**1318**				

CAN DEVELOPMENT BE ALLOCATED IN LOWEST RISK SITES IN FLOOD ZONE 3?

3. – Identified residential (and mixed use) sites with areas of site in flood zones 2/ 3

A number of the residential or mixed use allocations (incorporating residential uses) proposed in the AAP are located with areas in flood zone 3, having between a 1% and 5% annual probability of flooding. The NPPF and NPPG advise that such sites should be the next to be considered in sequential terms where insufficient land has been identified on sites entirely within flood zone 1 or 2. It should be noted that sites within this category include land within flood zone 1, 2, 3a and 3b (the percentage is indicated in the table below) but are included within flood zone 3 for the purposes of this assessment because it is assumed land identified as the functional floodplain (3b) will not be required to be developed to achieve the dwelling capacities assumed for the sites.

It should also be noted that given the small areas of land within higher risk flood zones and the functional flood plain, the SFRA Level 2 states that it should be possible to locate development outside these high risk areas for these sites.

Sites SE1 and NBW1 are large sites. It should therefore be possible to locate residential uses outside of Flood Zone 3b while still achieving proposed residential site yields. As only a nominal area of site NB5 is within flood zone 3b it is assumed development will be able to avoid the functional flood plain on this site. Results are set out in the table below:

Site Ref	Site name	Site Area (ha)	Proposed Use	Dwellings	% in zone 2	% in zone 3a	% zone 3b	Results of Sequential Test
Remaining AAP balance carried forward				**1318**				
DF2	Junction Bridge	0.71	mixed use	Not in latest SHLAA so non assumed	20.39	7.72	0	Appropriate to allocate, subject to site layout
DF5	Dockfield Road South	0.7	mixed use	50	46.07	3.2	0	Appropriate to allocate, subject to site layout
SE1*	Shipley East	8.9	Residential led mixed use	151	10.78	6.64	9.51	Appropriate to allocate, subject to exceptions test
NBW1*	New Bolton Woods	49.29	Residential led mixed use	1150	8.34	4.77	2.62	Appropriate to allocate, subject to exceptions test
NBW5	Valley Road Flats	1.29	Residential	30	10.9	3.38	1.09	Appropriate to allocate subject to exceptions test
Total Dwellings				**3163**				
Remaining AAP housing requirement to find				**-63**				

* Identified sites with planning permission

The potential housing / mixed use allocations with small areas of the site in flood zone 2 and 3A can provide a further estimated capacity of 1371 dwellings. When these sites are discounted from the total requirement the Core Strategy AAP Housing Requirement has been met.

There is a surplus of dwellings when compared to the Core Strategy housing requirement. However, each of these sites individually pass the sequential test because land with areas in flood zone 3 is required to meet the housing requirement for SCRC as set out in Core Strategy. It should also be noted that the housing requirement for the AAP is a minimum target. All the sites contain brownfield land within a defined regeneration area and are sustainably located. There no planning or sustainability justification for sequentially preferring one site over another in these circumstances subject to each site satisfying the requirements of the flood risk exception test

The SCRC housing target is a net target which must factor in completions and projected losses post 2016 to the existing housing stock from clearance and revise the housing requirement to compensate accordingly. The proposed AAP housing/mixed use allocations within flood zone 1, zone 2 and with areas in zone 3 can provide estimated capacity for 3163 dwellings.

IS THE DEVELOPMENT APPROPRIATE IN REMAINING AREAS?

4a. Identified residential site in flood zones 3ai

A proposed residential allocation in the AAP is located in flood zone 3ai, having 5% annual probability of flooding. It should be noted that Zone 3ai is defined in the SFRA L2 as "*Developed land within Flood Zone 3 where water would flow or be stored in times of flooding if not already constrained by development. In NPPF terms these areas would constitute Flood Zone 3a, however following discussion with the Environment Agency it was agreed that Flood Zone 3a should be subdivided so as to indicate those areas of higher risk… Flood Zone 3ai includes the areas of land that would be in Flood Zone 3b if not already developed. Flood Zone 3ai should therefore be used as an indicator of flood risk, from a modelled 1 in 20 year event, to existing development sites".*

Site Ref	Site name	Site Area (ha)	Proposed Use	Dwellings	% in zone 3a	% in zone 3ai	% zone 3b	Results of Sequential Test
Remaining net AAP balance to find				**47**				
CCF4*	Singleton Street	0.39	residential	60	4.33	99.89	0	Appropriate to allocate subject to exceptions test
Total Dwellings				**3223**				
Remaining net AAP housing requirement to find				**0**				

*Sites with planning permission

The potential residential allocation in flood zone 3ai can provide a further estimated capacity of 60 dwellings. When this site is discounted from the total requirement the net AAP Housing Requirement has been met.

The site contains an existing buildings which has prior approval for a change of use from office to residential, which is supported by a site specific FRA.

OTHER SITES NOT CONSIDERED APPROPRIATE

4b. Identified mixed use site with areas of site in flood zone 3 and functional floodplain (3b)

A mixed use allocation (incorporating residential uses) proposed in the AAP is located in the functional floodplain (3b) with areas in flood zone 3a. The NPPF and NPPG advise that areas in the functional floodplain should be avoided except for water compatible uses.

Site Ref	Site name	Site Area (ha)	Proposed Use	Dwellings	% in zone 3a	% in zone 3ai	% zone 3b	Results of Sequential Test
Remaining net AAP balance to find								
DF4	Dockfield Road North	0.71	mixed use	40	12.32	2.03	84.57	Substitute proposed residential mixed use allocation for green infrastructure in functional floodplain and combine with site DF4 to enable comprehensive approach to managing flood risk across the combined site and direct more vulnerable uses to lower flood risk areas in DF4
Total Dwellings				**40**				

The potential mixed use allocation can provide a further estimated capacity of 40 dwellings. The SFRA L2 identifies that 84.6% of the footprint is within the functional floodplain, meaning 84.6% of the site should be safeguarded for open space and for flood storage. The site area is small at 0.6 ha meaning any changes in layout to remove residential development from Flood Zone 3a would not be possible. As the AAP residential requirement has been met the proposed mixed use site (with residential uses) is not considered to pass the sequential test.

There are strategic objectives in the Core Strategy for regenerating and bringing vacant brownfield land in sustainable locations back into use. Site DF5 is located adjacent to site DF4 on the south side of Dockfield Road. This site is also brownfield land with the same proposed uses. The SFRA L2 identifies that an option could be to combine sites DF4 and DF5 in such a way that development is directed to site DF5 and the higher risk areas of DF4 site are substituted for water compatible uses such as green infrastructure and for flood risk management.

Combining sites DF4 and DF5 will allow the AAP housing target to still be met and the combined site to be viably and comprehensively developed for residential/mixed

use and enable the combined site DF4/DF5 to pass the sequential test following substitution of uses and avoiding areas of the functional flood plain.