

Flooding



Supplementary Planning Document

July 2012

Spelthorne Borough Council

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1 Introduction

- 1.1 Flood events in various parts of the country over the past 15 years or so provide a reminder of their devastating effect, including loss of life, and the need to have a comprehensive approach to dealing with the risk.
- 1.2 The purpose of this document is to explain in more detail the Council's policy on development in areas of flood risk. Policy LO1 'Flooding' is set out in the Core Strategy and Policies Development Plan Document¹ and is reproduced in Appendix A.
- 1.3 In addition to explaining the policy, factual information is also provided on the nature, extent and implications of flood risk facing the Borough.
- 1.4 The advice in this document is a 'material consideration' in determining planning applications in flood risk areas and is intended to answer the issues that most commonly arise. It is, however, important that anyone contemplating development not only carefully considers the general guidance in this document but also seeks the informal advice of the Council. In some cases it may also be necessary to obtain expert advice on the extent and potential implications of flooding on their site.
- 1.5 This advice will also be helpful to those looking to purchase a property within a flood risk area to assess whether a wish to carry out some form of development in the future is realistic.

2 Responsibilities for managing flood risk

- 2.1 Responsibility for managing flood risk and related issues rests with a number of different organisations. Whilst this document primarily deals with development related issues and the Borough Council's planning responsibilities, Appendix B outlines the responsibilities of other organisations in the wider issues of flooding. These other organisations include the Environment Agency (EA), Surrey County Council and Thames Water.

3 Flood Risk in Spelthorne

a. Causes of Flood Risk

- 3.1 There are various potential causes of flooding in Spelthorne but the most significant is from rivers². It is this form of flooding to which Policy LO1 applies and which is mapped in some detail.
- 3.2 At Appendix C is a plan showing the general extent of fluvial flood risk in Spelthorne by reference to three flood zones. The same plan also shows all 'main rivers'³ in the Borough. Paragraph 3.19 provides information about detailed flood risk maps and it is those maps and site specific flood information from the EA which should be used when considering development proposals.

¹ Core Strategy and Policies Development Plan Document, February 2009.

² Flooding from rivers is technically known as fluvial flooding.

³ 'Main rivers' is a technical term used by the Environment Agency to refer to the larger arterial watercourses. These include some watercourses in Spelthorne that are relatively small but nevertheless are significant in drainage terms.

3.3 Other forms of flooding include:

- a. Surface water flooding – this can arise after heavy rainfall but will usually quickly drain away into the gravel substrata which underlies much of the Borough unless the ‘water table’⁴ is already high and close to ground level. The main susceptible areas are shown on Surrey County Council’s Preliminary Flood Risk Assessment maps and maps held by the EA. This form of flooding does not normally cause flooding within buildings.
- b. Ground water flooding – this can arise in lower lying areas where the water table is high and rises to such an extent that water lies at about ground level.
- c. Sewers⁵ – the Borough has a separate foul sewer system and most surface water is disposed of by soakaways. The foul sewers are therefore not a significant source of flood risk themselves in Spelthorne but they may become inundated in times of fluvial flooding and therefore become overloaded.
- d. Reservoir flooding – the Borough has five major reservoirs. A failure of the embankments of any one could cause widespread flooding across the Borough. However, the risk of this happening is sufficiently low so that no limitation on development as a result of this form of flood risk is justified. Further detail on the extent of risk from this source is provided on the Environment Agency website⁶.

b. Risk based approach to flooding

- 3.4 In response to several significant flood events nationally in the mid/late 1990s the Government published Planning Policy Guidance Note No 25 ‘Development and Flood Risk’. In March 2012 it published the National Planning Policy Framework which deals with flood risk matters at paragraphs 99-108⁷.
- 3.5 The framework and technical guidance follows a ‘risk based approach’ to flooding which underpins the work/advice of the EA and the detailed planning policies on flooding prepared by local authorities.
- 3.6 This risk based approach requires:
 - a. A strategic approach which applies the Sequential Test and avoids adding to the causes or sources of flood risk by such means as

⁴ Water table: Is the level at which porous rock is saturated by underground water.

⁵ In order to avoid future risk of flooding from sewers developers are reminded to liaise with Thames Water about connections to the sewer system and to submit information with any planning application to demonstrate adequate sewer capacity either exists or will be provided prior to occupation of the development.

⁶ www.environment-agency.gov.uk – Reservoir Flood Maps page.

⁷ The National Planning Policy Framework (NPPF) has replaced most of the Government’s previous planning guidance including PPS 25. Alongside the NPPF it has also published ‘Technical Guidance to the National Planning Policy Framework’. A further document which supported PPS 25 ‘Planning Policy Statement 25: Development and Flood Risk Practice Guide’, December 2009 also remains as guidance. The new guidance, although shorter, does not seek to change the previous policy approach.

avoiding inappropriate development in flood risk areas and minimising run-off from new development onto adjacent and other downstream property and into the river system.

- b. Managing flood 'pathways' to reduce the likelihood of flooding by ensuring that the design and location of development does not obstruct flood flow routes. Account must also be taken of its susceptibility to flooding, the performance and processes of river systems and appropriate flood defences, the likely routes and storage of flood water and the impact of the development on flood risk downstream.

- c. Maximise the use of Sustainable Drainage Systems (SUDS)⁸.

- 3.7 Decisions about where development should go are to be made on the basis of a 'sequential approach' where areas of no flood risk or lower risk should be considered before areas of greater flood risk.
- 3.8 Part of this objective approach to assessing risk is the requirement to undertake Flood Risk Assessments (FRAs). These are prepared at a strategic level for whole local authority areas in the form of Strategic Flood Risk Assessments (SFRAs) as well as flood risk assessments of individual development proposals.
- 3.9 Exceptions to the 'sequential approach' can be considered, but only where there is a wider 'sustainable development' justification, including the need to avoid social or economic blight.

c. Fluvial Flood Risk

- 3.10 The main flood risk in Spelthorne comes from the River Thames. Spelthorne is located in the Lower Thames area with a larger part of its catchment area upstream of the Borough. That catchment area covers a significant part of central southern England extending up to within a few miles of Gloucester and Leamington Spa.
- 3.11 Two tributaries of the Thames also have a direct potential impact on the Borough:
 - a. River Colne system – the lower Colne Valley lies within the northwest part of the Borough and has a number of channels including the River Colne, the Colnbrook and Wraysbury River. The catchment area includes part of the Chilterns and outer northwest London. The River Colne joins the Thames at Staines. Part of the catchment area lies on areas of clay where run-off can be fast and heavy rainfall can lead to flash flooding. North of Staines the River Ash diverges from the Colne and takes a meandering course across the southern part of the Borough to join the Thames just up-stream of Sunbury Lock. The Stanwell Brook, and in turn the Stanwell and West Bedfont Ditches, flow into the River Ash between Ashford and Staines.
 - b. River Wey and Chertsey Bourne – these enter the Thames near Shepperton Lock and have a combined catchment area extending as far south as Haslemere. Whilst they do not pass through the

⁸ SUDS – for further information see paragraphs 4.20-4.24.

Borough, flood water on these rivers would increase levels on the Thames and potentially affect areas downstream of Shepperton, including Sunbury. The catchment areas are generally on chalk and sand/gravel and whilst flash flooding does not normally occur, water levels can rise more quickly than on the Thames itself because of the shorter length of the rivers and their tributaries.

- 3.12 The Borough has only experienced major flooding twice in the past 120 years – in 1894 (1 in 100 year event) and 1947 (1 in 56 year event). However, the predicted return periods for such events are simply a mathematical expression of their probability, where a 1 in 100 year event means there is a 1% chance of it happening in any year. However, it is possible for several major flood events to occur in a very short space of time⁹.
- 3.13 The risk of flooding is determined by the normal capacity of the River Thames at any particular point on the river and the extent to which the flow of water created during severe weather conditions exceed this capacity. The following table provides an indication of the capacity of the Thames through Staines and the flow of water that can occur in specific flood events.

Table 1 Capacity of the River Thames at Staines¹⁰

Condition/Event	Estimate probability of recurrence	Flow rates in cumecs ¹¹
Normal summer conditions	-	50 cumecs
Bank full	-	250 cumecs
2003 floods	1 in 14	390 cumecs
1947 floods	1 in 56	535 cumecs
1894 floods	1 in 100	600 cumecs

- 3.14 High flow rates cause major flooding, which in this reach of the Thames can extend more than a mile either side of the river affecting large parts of Spelthorne, Runnymede and to a lesser extent Elmbridge.
- 3.15 Whilst the natural flood plain covers extensive undeveloped areas, a major flood event would also impact on some urban areas, particularly parts of Staines, Laleham, Shepperton and Lower Sunbury. The following table gives an indication of the extent of that risk in terms of residential properties and the number of people likely to be affected in a 1 in 20 and 1 in 100 year event, both in Spelthorne as a whole and the wider Lower Thames area¹². Given such floods could last for weeks the enormous impact on people and property serves to emphasise the importance of an appropriate flood policy – not least to ensure future development does not add to the problem.

⁹ In 2007, during the major floods around Gloucester and Tewksbury, two major peaks of flood water occurred. In 1990 flooding in Colnbrook exceeded the 1947 flood levels on 3 occasions.

¹⁰ Spelthorne Strategic Flood Risk Assessment, paragraph 42, page 10.

¹¹ Cumecs = Cubic metres per second, which is a measure of water flow.

¹² The Lower Thames area extends from Datchet to Teddington and includes parts of the Boroughs of Windsor & Maidenhead (Horton, Datchet and Wraysbury), Spelthorne, Runnymede, Elmbridge, Kingston and Richmond.

Table 2 People and Property at Flood Risk¹³

Level of Flood Risk	Spelthorne		Lower Thames area	
	Properties	People	Properties	People
1 in 20	680	1,700	5,300	13,000
1 in 100	2,800	7,000	15,000	36,000

d. Climate change

- 3.16 The climate of the UK has always experienced varying degrees of change and projections for the UK suggest this will continue. Heatwaves have become more frequent in summer and there are now fewer frosts and winter cold spells. Winters over the last 200 years have become wetter relative to the summers and a larger proportion of winter precipitation in all regions now falls on heavy rainfall days than was the case 50 years ago¹⁴. This suggests that flood events could become more frequent and the area affected by flood water could be greater.

e. Flood Risk and Flood Risk Vulnerability

- 3.17 Fluvial flood risk nationally is classified into 4 zones which relate to the relative probability of flooding. This classification is summarised in Table 3 'Flood Zones'. A definition of the appropriate uses of land/buildings for each flood zone is set out in Table 4 'Flood Risk Vulnerability Classification'. The purpose of these two tables is to identify uses appropriate to differing levels of flood risk.

Table 3 Flood Zones

Zone	Probability of flooding	Appropriate uses
Zone 1	Low probability Less than 1 in 1000 risk (0.1%)	All categories shown in Table 4 are appropriate
Zone 2	Medium probability Risk 1 in 100 to 1 in 1000 (1% to 0.1%)	Water compatible Less vulnerable More vulnerable Essential infrastructure
Zone 3a	High probability 1 in 20 to 1 in 100 (5% to 1%)	Water compatible Less vulnerable uses Essential infrastructure
Zone 3b	Functional flood plain 1 in 20 or greater (greater than 5%)	Water compatible Essential infrastructure

¹³ Data supplied by the Environment Agency.

¹⁴ Previously explained in PPS 25 'Development and Flood Risk' – Annexe B.

Table 4 Flood Risk Vulnerability Classification¹⁵

Category	Appropriate uses
Essential Infrastructure	Essential transport infrastructure, including evacuation routes, and strategic utility infrastructure, including grid and primary substations.
Highly vulnerable	Police, Fire and Ambulance stations, Command Centres and telecommunication installations required to be operational in times of flood. Emergency dispersal points, basement dwellings, caravans, mobile homes and park homes intended for permanent residential use. Installations requiring hazardous substance consent.
More vulnerable	Hospitals. Residential institutes including care homes, children's homes, prisons and hostels. Dwelling houses, student halls and hotels. Non-residential uses for health services, nurseries and education. Caravan and camping sites.
Less vulnerable	Shops, offices, industry and storage uses. Agriculture, waste treatment (except landfill and hazardous waste) and minerals workings and processing. Water treatment and sewage treatment subject to adequate pollution control measures.
Water compatible	Flood control, water/sewage transmission, water based recreation and amenity open space including changing rooms. Essential sleeping accommodation for the water compatible uses.

f. Strategic Flood Risk Assessment

- 3.18 In 2006 the Council commissioned consultants to prepare a Strategic Flood Risk Assessment (SFRA) for the Borough¹⁶. The assessment used what was then the latest flood risk modelling and quantified the extent and nature of the flood risk in the Borough. An SFRA Part II¹⁷ was also prepared by the Council in conjunction with the consultants, which assessed the implications of the main report and included a draft flood policy. That draft policy is essentially the same as Policy LO1 in the Core Strategy and Policies DPD.
- 3.19 The modelling which was used in the SFRA has since been further refined by the EA and is reflected in flood maps now available on the EA website¹⁸ as well as the Council's own website¹⁹. The Council's website shows maps depicting the 1 in 20, 1 in 100 and 1 in 1000 flood outlines and to which Policy LO1 relates. The EA website shows only the 1 in 100 and 1 in 1000 outlines.
- 3.20 The EA publishes regular updates of their flood maps which are used to update the Council's maps. Updates of flood modelling arise for a number of reasons

¹⁵ Source: Technical Guidance to the National Planning Policy Framework, Table 2 page 6.

¹⁶ Spelthorne Borough Council Strategic Flood Risk Assessment (SFRA), December 2006.

¹⁷ Spelthorne Strategic Flood Risk Assessment Part II, February 2007.

¹⁸ For further information on flood maps and how they are produced: www.environment-agency.gov.uk – Flood Map – your questions answered page.

¹⁹ See Appendix D.

including further more detailed assessment work, any additional flood defences or changes in channel capacity or recent flood or high water events enabling a more detailed understanding of how flood water may behave. Such updating is important so the most accurate picture of flood risk is available. Users of either the EA records or those of the Council should therefore ensure they have the latest information.

4 Application of Policy LO1

a. General issues

- 4.1 Before dealing with the specific requirements of Policy LO1 some general issues are explained.

i. Spelthorne's approach to flood risk

- 4.2 Spelthorne's approach to development and flood risk in Policy LO1 is to:
1. Support measures to reduce the risk of flooding to existing properties.
 2. Apply strict controls over new development.
- 4.3 On the EA website is 'standing advice' which explains its general approach to specific forms of development under various flood risk circumstances.
- 4.4 Whilst councils consult the EA for flood risk advice on larger proposals, decisions on planning applications rest with local planning authorities. Policy LO1 and this guidance explain in detail Spelthorne's approach to making such decisions, and the EA supports Policy LO1. In several respects, because of the severity of flood risk in Spelthorne, the Council's requirements are more stringent than the general requirements of government policy or the EA.
- 4.5 The EA website also identifies those types of development it does not wish to be consulted on. However, the EA's wish not to be consulted on certain matters should not be inferred as 'supporting' or 'not objecting to' those development types, it simply means that the EA is leaving the matter for the local authority to decide.

ii. Proposals to deal with flood risk

- 4.6 The supporting text to Policy LO1 (para 5.14 in the Core Strategy and Policies DPD) refers to the Environment Agency's 'Lower Thames Strategy' which is a package of measures to reduce flood risk in the section of the River Thames from Datchet to Teddington. The strategy has been formulated over a number of years. The package was approved by the EA Board in November 2010 and the strategy was agreed by Defra²⁰ in July 2011.

²⁰ Department of Environment, Food and Rural Affairs.

4.7 The 'Strategy' involves the following:

- a. Engineered components – 3 flood diversion channels to relieve existing urban areas between:
 - i. Datchet and Wraysbury – on north bank
 - i. Egham and Chertsey – on west bank
 - ii. Chertsey and Shepperton – on north bank
- b. Structural improvements to increase the capacity of Teddington, Molesey and Sunbury weirs and widening of the Desborough Channel by 3-4 metres.
- c. Flood plain management involving:
 - i. Controlling development in flood plains
 - ii. Safeguarding flood flow routes
 - iii. An intention to develop flood plain management software to help visualise flood risk
 - iv. Introducing community based protection measures, such as flood resistance work for the most vulnerable properties that will not be protected by the diversion channels.

4.8 As at April 2012 detailed design work and sources for all the necessary funding had not been progressed. However, further details of the strategy, including routes of the flood relief channels, are available on the EA website²¹. The scale and cost of what is proposed may take many years to complete. It is not proposed to start construction before 2019, subject to planning approval, and the construction may well be beyond the current end date of the Council's Core Strategy and Policies DPD of 2026.

iii. **Application of a Sequential Approach in Spelthorne**

- 4.9 Studies of land availability for housing and employment have shown that in Spelthorne land in both Zones 1 and 2 will be needed to meet housing and other needs over the next 15 years and therefore sites in either zone will be acceptable. There is, however, no housing need case to use land in Flood Zone 3 for housing where risks cannot be overcome.
- 4.10 Commercial areas in the Borough, including Staines Town Centre, are subject to varying degrees of flood risk - from 1 in 20 to 1 in 1000. For economic and social reasons it is considered unrealistic in sustainability terms to prevent further development or redevelopment in these commercial areas as this would inhibit their role in meeting the needs of the wider area. Therefore, as an exception to the sequential approach, redevelopment in any designated commercial area subject to flood risk will be allowed in principle. This also applies to other existing commercial areas and sites where there are no other overriding policy objections.
- 4.11 Policy LO1, however, requires that commercial developments in Flood Zone 3, which includes large areas of Staines Town Centre, result in a reduction in flood risk. This is to be achieved by providing a net increase in flood storage

²¹ www.environment-agency.gov.uk – Lower Thames page.

capacity of at least 20%, reducing impedance to the flow of flood water and other requirements which are explained below.

iv. **Approach to ‘permitted development’**

- 4.12 Extensions and other structures up to a certain size and position within the curtilage of a dwelling can be built without planning permission under what is called ‘permitted development’. Accordingly the Council has no control over them. Sometimes those wishing to extend their homes in a flood risk area propose that account should be given to what could be built under permitted development and only the amount of proposed development over and above that should be taken into account in deciding on the extent of harm in flood risk terms. Whilst the existence of permitted development rights is a material consideration, there are some important qualifications to the circumstances where permitted development rights will be given weight when assessing the flood risk implications of a proposal:
- a. Little weight will be given to the demolition of outbuildings since by their nature they are usually structures which are floodable/allowed to flood, whereas a proposed extension for habitable purposes is not. A new extension is likely to result in a greater loss of flood plain storage than a floodable structure.
 - b. An extension may be equivalent in floor space to an extension that might, in a different position or configuration, be permitted development. However, the proposal may be located in a position where it causes greater impedance to the flow of flood water and/or loss of flood storage capacity and therefore cause more harm in flood risk terms.
 - c. The permitted development rights that are claimed are not capable or likely of being implemented and therefore do not represent a real ‘fall-back’ position that can reasonably be taken into account.
- 4.13 Where planning permission is granted for a replacement dwelling in Flood Zone 3, ‘permitted development’ rights will be removed so as to control further development which may increase the flood risk.

v. **‘Dry Islands’**

- 4.14 The flood plain within Spelthorne is relatively flat and covers a large area. Within this flood plain are areas of slightly higher ground which are less prone to flooding than the land around them or may not flood at all. However, these areas would be surrounded by flood water in times of flood. Such areas are often referred to as ‘dry islands’. During prolonged periods of flooding those living in these areas may be unable to leave and may require the assistance of the emergency services. Building additional residential properties on land surrounded by 1 in 20 and 1 in 100 flood risk areas will add to the problems a major flood will cause to emergency services and occupants. Proposals for additional dwellings on ‘dry islands’ will therefore be treated the same as for the level of flood risk in the area surrounding them regardless of their size. It is therefore important that those contemplating development not only use the flood maps to establish the flood risk at their particular site but also that of the wider area to ensure there is a dry route to a point outside the flood plain.

b. Consideration of each element of Policy LO1

4.15 Each section of Policy LO1 is explained in the following text:

The Policy starts with the statement:

'The Council will seek to reduce flood risk and its adverse effects on people and property in Spelthorne'.

4.16 This reflects the overall intention of the policy which is not just about preventing development in areas of high flood risk but also reducing the level of flood risk that already exists.

4.17 ***a) Support appropriate comprehensive flood risk management measures within or affecting the Borough which are agreed by the Environment Agency'***

4.18 Policy LO1 makes clear that the Council supports the principle of such a comprehensive approach. It will not allow any development which would prejudice the implementation of the engineered components described in paragraph 4.7 that may be developed by the EA in the future.

4.19 The Council will not permit development in the flood plain in anticipation of the full implementation of the Lower Thames Strategy because this would add to current levels of flood risk.

4.20 ***b) Reducing the risk of flooding from surface water and its contribution to fluvial flooding by requiring all developments of one or more dwellings and all other development over 100m² of floorspace in the Borough to have appropriate sustainable drainage schemes.***

4.21 The objective of 'sustainable drainage systems' is to slow up the rate at which rainfall eventually ends up in rivers and other watercourses. With intense periods of rainfall there is a risk of rapid run-off to watercourses resulting in 'flash flooding' from these watercourses.

4.22 Most of Spelthorne is underlain by river terrace gravels which comprise a granular material which can absorb large amount of water in the ground. Most of the drainage from the roofs of buildings and other hard surfaces in the Borough goes into soakaways dug into the gravel layers and represent an appropriate sustainable way of draining away such water.

4.23 For larger developments with more extensive surfaced areas additional measures for storing rainwater may be required and should be considered at the design stage. This must be considered within the flood risk assessment for a scheme and the advice of the EA on sites over 1ha should be sought.

4.24 In the case of larger developments, even those outside of Flood Zones 2 and 3, additional sustainable drainage measures may be required because run-off in these areas will also add to water entering watercourses and potentially contribute to raised floodwater levels. See the following sub-point (h).

4.25 ***c) Maintaining flood storage capacity within Flood Zone 3 by refusing any form of development on undeveloped sites which reduces flood storage capacity or impedes the flow of flood water.***

- 4.26 The purpose of this requirement is to keep the undeveloped parts of the flood plain free of development. This allows the flood plain to continue to perform its natural function and avoid flood water otherwise spreading into areas not currently at risk. This requirement will apply not only to existing open land which is designated as Green Belt, but also to open land within urban areas liable to flood.
- 4.27 ***d) Maintaining the effectiveness of the more frequently flooded area (Zone 3b) of the flood plain to both store water and allow the movement of fast flowing water by not permitting any additional development including extensions.***
- 4.28 The purpose of this requirement is to ensure that there is very strict control on development in frequently flooded areas and areas which, in a major flood event, are likely to have fast flowing flood water. Zone 3b is where the flood risk is 1 in 20 or greater. Within this flood risk area there is already some development and structures which will impede the flow of flood water. The intention of this part of the policy is to avoid adding to that development and making matters worse.
- 4.29 Paragraph 4.12 sets out the Council's approach to 'permitted development' rights and the account that may be given to them.
- 4.30 Where there are existing structures which are proposed to be removed on a site as part of a proposal for an extension, the potential beneficial effects of removing these to provide greater flood storage capacity and less flood water impedance can be taken into account. Only where the benefits equal or exceed the impact of an extension will a proposal be acceptable. The acceptability will need to be demonstrated by the applicant in a Flood Risk Assessment (FRA) which provides detailed calculations, including information relating to the depth of flood water in relation to the proposed structure and the degree of impedance to the flow of flood water.
- 4.31 Where proposals are submitted to replace an existing dwelling it will be expected to have no greater impact in flood terms than the existing, and 'permitted development' rights will be removed to prevent extensions without the need for planning permission. Those contemplating such proposals will need to ensure that any raising of the new structure to bring ground floor levels above the predicted flood levels or any increase in flood storage capacity is compatible with the character of properties in the immediate area and is consistent with the Council's design policies^{22 23}.
- 4.32 For the same reasons that extensions need to be controlled in Flood Zone 3b, strict control will also be applied over proposals for terraces and decking areas where they need planning permission and either involve raising ground levels and/or reducing flood storage capacity. Walls and fences can also impede the flow of floodwater and where they require planning permission the Council will require permeable forms of these to be used.²⁴

²² Policy EN1 Core Strategy and Policies DPD.

²³ Supplementary Planning Document 'Design of Residential Extensions and New Residential Development'.

²⁴ Examples of permeable fences are 'hit and miss fences' where vertical slats are fixed alternately either side of cross rails between posts. Walls can also incorporate holes at lower levels to allow water to percolate through.

- 4.33 ***e) Not permitting residential development or change of use or other 'more vulnerable' uses within Zone 3a or 'highly vulnerable uses' within Zone 2 where flood risks cannot be overcome.***
- 4.34 The purpose of this requirement is to prevent:
- a. Additional residential development in areas where there is a high probability of flooding (Zone 3a – up to 1 in 100) including change of use to residential and 'more vulnerable' uses such as hospitals or care homes (See Tables 3 and 4).
 - b. 'highly vulnerable uses' within Flood Zone 2 (1 in 1000).
- 4.35 This follows the principle that the most sensitive uses should be put in areas of lower flood risk.
- 4.36 Circumstances can arise where a site straddles Flood Zone 3a and Zone 2 or immediately abuts Zone 2. In such cases a 'dry route' of escape in a 1 in 100 year event may exist or can be created without adding to flood risk to allow people to leave buildings safely. The precise extent of flood risk for the site must be demonstrated with information based on a detailed topographical survey of existing ground levels and modelled flood levels provided by the EA. Neither the development nor means of ensuring a 'dry escape' in a 1 in 100 year event must involve either the impedance of the flow of flood water, loss of flood storage capacity or in anyway add to the risk of flooding elsewhere.
- 4.37 Applicants sometimes seek to argue that it is safe and therefore reasonable for people to 'escape' by walking through flood waters of a limited depth. The Council does not accept that walking through flood water can be safe because:
- a. Where there is fast moving water, even of shallow depth, it can be dangerous particularly to children and those who are frail.
 - b. Still water will usually be dirty and silted with significant amounts of debris floating in it. It will in many cases be impossible to be certain of its exact depth and where hidden obstacles including holes might be. The water is likely to be contaminated by sewage and be a health risk if accidentally swallowed following a fall.
- 4.38 There are methods of assessing the relative level of hazard associated with areas at flood risk and the EA is able to supply relevant information. However, Flood Risk Hazard Assessments are only useful where it is demonstrated there is no alternative to placing a use or development in an area of flood risk and sites and escape routes of least risk need to be identified. As already explained in paragraph 4.9 there is no need for any new housing in Spelthorne to be built in areas of higher flood risk (Flood Zone 3) and which require people to walk through flood water to leave their property. The Council's position is that for residential development the only safe route of escape is a dry route.
- 4.39 Where there would not be a dry route of escape in a 1 in 100 + climate change flood event from new residential development, conversions to residential use, or other 'more vulnerable' or 'highly vulnerable' uses, an appropriate flood evacuation plan will be required to be submitted to and approved by the Council.

4.40 **f) Supporting the redevelopment of existing developed sites in the urban area in Zones 3a and 3b for 'less vulnerable' uses where:**

- i. **a minimum increase of flood storage capacity of 20% can be secured (all flood storage areas to be effective at all times throughout the lifetime of the structure/use and do not create unacceptable risks to people in times of flood),**
- ii. **it reduces impedance to the flow of flood water where there would be flowing flood water,**
- iii. **appropriate access for the maintenance of water courses is maintained,**
- iv. **there is no adverse impact on the integrity and effectiveness of flood defence structures.**

4.41 The purpose of this section is to ensure that where non-residential development has to be accepted it results in an overall reduction of flood risk.

4.42 It recognises that the existing flood risk areas do include existing commercial areas and preventing either redevelopment or rebuilding is unrealistic. This applies to 'less vulnerable' uses including shops, offices, industry and warehousing and this part of Policy LO1 is particularly relevant to Staines Town Centre.

4.43 In some cases the requirements for a net increase in flood storage capacity can be met by incorporating floodable voids at the ground level of the building. It can also be met by providing compensatory flood storage capacity in either a part of the site or an adjoining/nearby site which is outside of the 1 in 100 flood risk area.

4.44 Any proposals must include detailed information demonstrating that the requirements can be met, including control over other land that may be involved.

4.45 **g) Requiring any development in Zones 2, 3a and 3b to be designed to be flood resilient/resistant.**

4.46 It is important where any new structures are proposed and justified in areas of flood risk that they are designed to avoid the adverse impacts of flood water. Many of the techniques can be applied to existing structures.

4.47 In the first instance the aim should be to design new buildings in such a way that flood water is prevented from entering the building and damaging its fabric. This is referred to as being 'flood resistant'. The most effective way of achieving this is by ensuring that the ground floor level is above the height of any floodwater in a 1 in 100 year event.

4.48 For the purpose of assessing the appropriate height of the floor in new buildings the Council adopts a precautionary approach of using a level equal to 1 in 100 +20% for climate change plus a 300mm further clearance. This will ensure the building is resistant to wave action, the underside of the floor is clear of flood water and there is some flexibility in coping with floods exceeding a 1 in 100 level.

4.49 Where it is not possible to make a new building wholly 'flood resistant' there are products available to prevent water entering a building via doorways and airbricks. However, these tend to be most effective where floods are of short duration and height – particularly flash floods or on the margins of flood risk

areas. During prolonged periods of raised water levels (several days), which are more likely in Spelthorne, floodwater can saturate building structures and seep in through cracks, etc.

- 4.50 For extensions to existing properties, including residential property, it will usually be impractical to set the floor level at a height which is different to the floor level of the existing building. For this reason higher floor levels will not be required. However, where they are provided the external design of the extension in relation to the host building must be acceptable.
- 4.51 Where it is not possible to prevent water from entering a building they should be designed in such a way that they are 'flood resilient'. The main principle in flood resilience is that finishes and fittings are not capable of being adversely affected by water entering the building. This will involve using forms of plaster that is water resistant and setting all electrical, communication and central heating fittings higher than any predicted flood water levels.
- 4.52 There are a wide range of issues to consider in making buildings flood resistant or resilient and further information on flood resistance and resilience is available in the document 'Improving the Flood Performance of New Buildings', May 2007²⁵.
- 4.53 ***h) Requiring all development proposals within Zones 2, 3a and 3b, and development outside this area (Zone 1) on sites of 0.5ha or of 10 dwellings or 1000m² of non-residential development or more, to be supported by an appropriate Flood Risk Assessment.***
- 4.54 The preparation of an appropriate FRA is essential in giving the Council an accurate understanding of the flood risks associated with a particular development. It will need to consider all sources of flooding, not just fluvial flooding. In line with statutory requirements planning applications will not be considered valid by the Council unless they are accompanied by an FRA. An FRA will also be essential to those designing a scheme so that appropriate account can be taken of any particular flood risk related requirements.
- 4.55 FRAs help answer important questions about whether development will:
- a. increase the number of people at flood risk,
 - b. increase flood risk elsewhere through loss of flood storage capacity, impedance to the flow of flood water or increased run-off,
 - c. adversely impact on the effectiveness of existing water courses and/or flood defences.
- 4.56 FRAs will be required for any new buildings or changes of use within Flood Zones 2, 3a and 3b. They are also required in Zone 1 for sites exceeding 0.5ha or 10 dwellings or 1000m² of non-residential development. The reason for the requirement for an FRA for larger developments in Flood Zone 1 is so that the potential increase in run-off from a site and potential contribution to increasing flood risk elsewhere is understood and appropriately mitigated. They will also be required in Flood Zone 1 where any form of development comes within 8 metres of a 'main river' and will need to demonstrate there is no adverse impact on the ability to maintain the watercourse.

²⁵ 'Improving the Flood Performance of New Buildings', May 2007. DCLG

- 4.57 In the case of residential extensions, an FRA as set out in Appendix E will be required. In Flood Zones 2 and 3a information will be required in a simple FRA statement to confirm (a) that the development is not within 8 metres of a 'main river' or will not otherwise affect its maintenance as a watercourse and (b) flood resistant methods of construction are to be used.
- 4.58 Detailed information is provided on the Environment Agency website on the requirements for FRAs²⁶ and the essential elements of an assessment are also explained below. The level of detail required will depend on the proposal.
- 4.59 Before proceeding with the preparation of a detailed FRA, those who are contemplating any type of development are strongly advised to go through the questions set out in Table 5. These provide an initial check to identify if fundamental objections may exist to the use that is proposed (screening assessment). The questions have been designed to enable both householders and others to undertake the assessment without professional assistance using the information which is either set out in this document or, in the case of flood maps, set out on the Council's website. If it is unclear whether a particular use may be acceptable, or how the Council's flood policy might apply, it is strongly advised to seek further informal advice from the Council before proceeding further.

Table 5 Screening assessment of whether a proposed use may be acceptable

	Questions	Comment
1.	Which flood risk area is the site located in (note all sites in the Borough will be within one of the flood zones)?	The Council's website has map based information on Flood Zones 2, 3a and 3b. Flood Zone 1 is all of the uncoloured area on these maps. (Step by step instructions to access the maps are given in Appendix D)
2.	Is the proposed use compatible with this flood zone?	Check Tables 3 and 4 in this document to see if the use is appropriate.
3.	If the use is compatible with the flood zone, do the requirements of Policy LO1 impose further restrictions preventing development in principle?	Check Policy LO1 in the Core Strategy and Policies DPD or in Appendix A of this SPD.
4.	Are there any genuine exceptions to justify a proposal contrary to Policy LO1?	These would need to be clearly documented as of sufficient importance to outweigh the flood risks.

- 4.60 Only if the response to the above questions is positive is it likely that planning permission may be granted and therefore worthwhile proceeding with a proposal.

²⁶ www.environment-agency.gov.uk – search on 'Flood Risk Assessments' and general advice for applicants and agents page.

4.61 Where a site is subject to flood risk a detailed FRA will help establish whether an acceptable scheme can be designed in a way which avoids these risks. Depending on the nature of the proposal this may still highlight potential objections in principle.

4.62 Using the information below an assessment can be made about:

- a. the precise extent and likely impact of flood water on a site,
- b. whether the form of development proposed is likely to result in an unacceptable loss of flood storage capacity or impede the flow of flood water,
- c. whether changes to an intended proposal can be made to overcome any flood related problems.

Table 6 Scoping assessment - information required to assess the level of flood risk

1.	Obtain an Ordnance Survey (OS) map of the site with sufficient area around it to include the printed ordnance datum levels shown (i.e. level of the ground relative to sea level)
2.	Obtain from the Environment Agency where available: <ol style="list-style-type: none"> a. Modelled flood levels for the 1 in 20, 1 in 100 and 1 in 100+20% for climate change for the site or points very close to the site (where highly vulnerable uses are proposed 1 in 1000 data will be needed). b. Modelled flow rate of flood water (direction of flow and rate of flow) and information on the depth of flood water. This is essential to check if there are risks from fast flowing flood water.
3.	Plot the EA's survey points on the OS plan (where they are not on the part of the site where the development will be, extrapolate the level for the site from the data supplied).
4.	Undertake a survey of the site to establish, in relation to the OS datum levels, the ground levels across the site and level of the ground floor of existing structures (this type of survey is commonly referred to as a topographical survey).
5.	By comparing the levels of the site/buildings with the EA flood data identify what level of flood risk exists, if any. If the site is subject to more than one flood zone the relevant boundaries of the zones should be shown on the plan.

4.63 If this more detailed assessment identifies issues that clearly cannot be overcome and planning permission is therefore unlikely to be granted, there is no point proceeding further with the FRA or submitting a planning application.

4.64 Where it appears that a scheme can be designed to comply with the Council's flood policy, an FRA must be submitted with any planning application. The amount of detail in an FRA will vary according to the nature of the use, form of development proposed and any particular factors related to the site, its locality and any flood compensation measures required. Some aspects may require

specialist technical advice or support. As a minimum an FRA for new buildings must contain the information set out below. The requirements for an FRA for residential extensions in Flood Zone 3b are set out in Appendix E.

- a. A topographical survey of the site showing the position of all structures and their ground floor levels, the levels across the site and those of the adjoining highway,
- b. Copies of the flood related information supplied by the EA,
- c. A plan of the site showing the location of the modelled survey points on which the EA flood data is based. (Where the EA modelled flood points are not on the site calculations must be provided which extrapolate the flood levels for the site),
- d. Confirmation of the projected depth of any flood water on the site and the rate and direction of any projected flow,
- e. Calculations of the net loss or gain in flood storage capacity arising from development of the site,
- f. The likely impact of any new structure on the movement of flood water across the site,
- g. In the case of residential development, at the margins of a flood risk area information must be provided to confirm there is a dry route from the site to a point outside of the flood plain during a 1 in 100 year flood event. This must be across public land or land which the occupants of the site have an agreement to use in perpetuity,
- h. Details of sustainable drainage,
- i. Details of any flood resistance and resilience measures.

4.65 Detailed technical information from the EA on modelled flood levels should be obtained by first contacting them via WTEnquiries@environment-agency.gov.uk

5 Impact on watercourses

- 5.1 It should be noted that where proposals are in, under, over or within 8 metres of a 'main river' or flood defence structure, in addition to planning permission being required from the Council, formal Flood Defence consent may be required from the Environment Agency. This process is intended to ensure that areas required to maintain 'main rivers' are preserved and that flood defence structures are not compromised. The plan at Appendix C shows all 'main rivers' in the Borough.
- 5.2 In addition, under Land Drainage legislation, consent will be required from Surrey County Council for damming or culverting a ditch or small watercourse.

6 Further information

- 6.1 The Council encourages people to seek pre-application advice and this includes those looking to purchase a property with a view to undertaking development some time in the future. This will help identify at an early stage if expectations of what may be acceptable are unrealistic and therefore save further costs. The arrangements for obtaining advice on specific proposals are set out on the Council's website²⁷.
- 6.2 The Council is also able to deal with general factual queries about flood matters in the Borough. The Environment Agency and Surrey County Council also have information on their websites. Relevant contact details are provided below:

Contacting Spelthorne Borough Council:

Telephone: Customer Services: 01784 451499
Email: planningdm@spelthorne.gov.uk
Web: www.spelthorne.gov.uk

Contacting the Environment Agency for general information:

Telephone: 03708 506 506
Email: enquiries@environment-agency.gov.uk
Web: www.environment-agency.gov.uk

Contacting Surrey County Council:

Telephone: 03456 009 009
Web: www.surreycc.gov.uk

²⁷ www.spelthorne.gov.uk – Pre-application Advice page

Policy LO1: Flooding

The Council will seek to reduce flood risk and its adverse effects on people and property in Spelthorne by:

- a) supporting appropriate comprehensive flood risk management measures within or affecting the Borough which are agreed by the Environment Agency,
- b) reducing the risk of flooding from surface water and its contribution to fluvial flooding by requiring all developments of one or more dwellings and all other development over 100m² of floorspace in the Borough to have appropriate sustainable drainage schemes,
- c) maintaining flood storage capacity within Flood Zone 3 by refusing any form of development on undeveloped sites which reduces flood storage capacity or impedes the flow of flood water,
- d) maintaining the effectiveness of the more frequently flooded area (Zone 3b) of the flood plain to both store water and allow the movement of fast flowing water by not permitting any additional development including extensions,
- e) not permitting residential development or change of use or other 'more vulnerable' uses within Zone 3a or 'highly vulnerable uses' within Zone 2 where flood risks cannot be overcome,
- f) supporting the redevelopment of existing developed sites in the urban area in Zones 3a and 3b for 'less vulnerable' uses where:
 - i a minimum increase of flood storage capacity of 20% can be secured (all flood storage areas to be effective at all times throughout the lifetime of the structure/use and do not create unacceptable risks to people in times of flood),
 - ii it reduces impedance to the flow of flood water where there would be flowing flood water,
 - iii appropriate access for the maintenance of water courses is maintained,
 - iv there is no adverse impact on the integrity and effectiveness of flood defence structures.
- g) requiring any development in Zones 2, 3a and 3b to be designed to be flood resilient/resistant,
- h) requiring all development proposals within Zones 2, 3a and 3b, and development outside this area (Zone 1) on sites of 0.5ha or of 10 dwellings or 1000m² of non-residential development or more, to be supported by an appropriate Flood Risk Assessment.

Flood related responsibilities

Spelthorne Borough Council

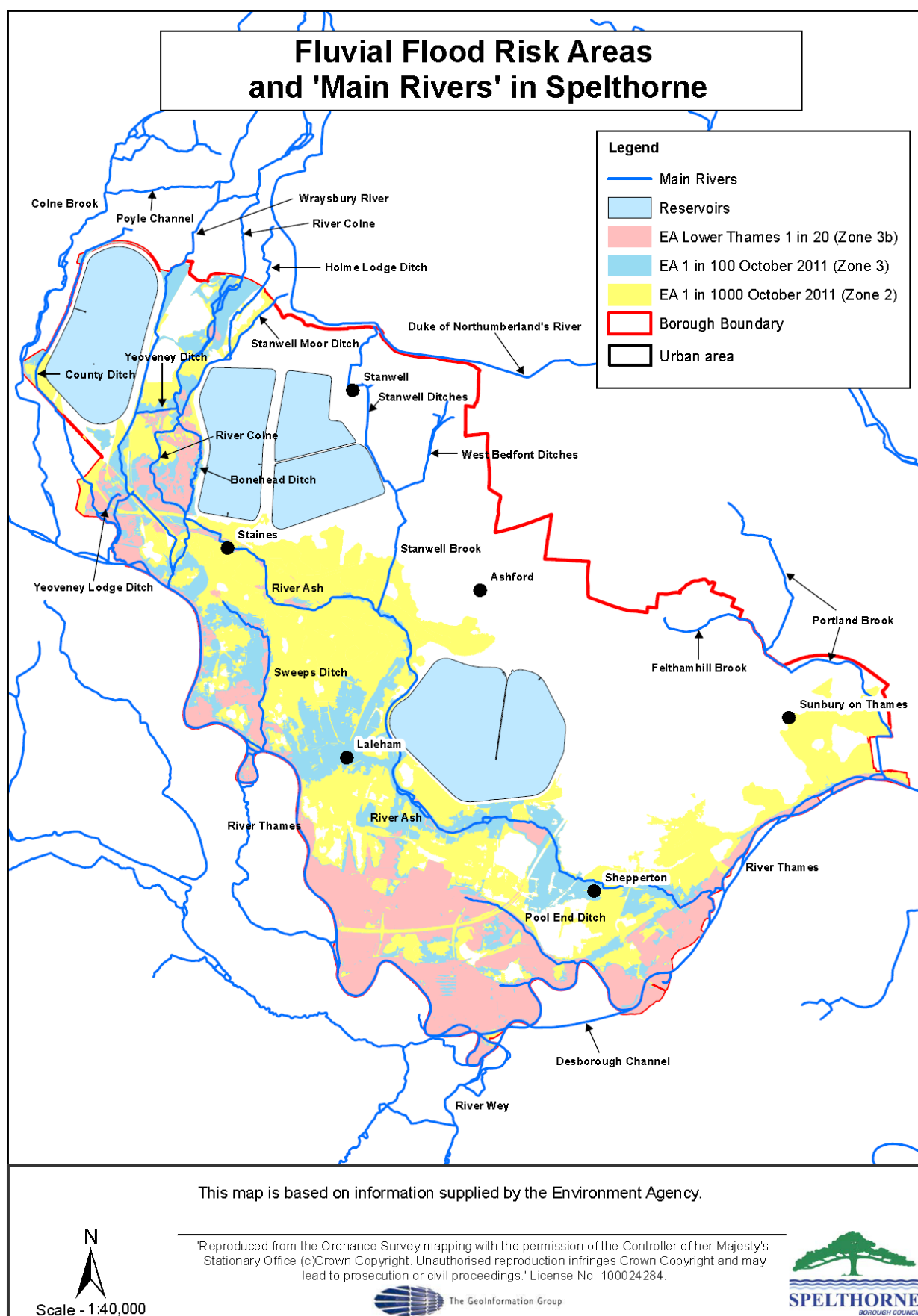
- statutory role in preparing local development plan documents
- statutory role in determining most planning applications
- emergency planning

Surrey County Council

- Surrey County Council is the Lead Local Flood Authority as set out in the Flood and Water Management Act 2010 and Flood Regulations 2009. They are required to prepare a Local Flood Risk Management Strategy to which District Councils must have regard.
- from October 2012 (to be confirmed) responsibility as the Sustainable Drainage Approval Body
- statutory role in preparing mineral and waste development plan documents
- statutory role in determining planning application for minerals, waste and its own planning proposals
- statutory role as 'highways authority'

Environment Agency

- Government agency which is responsible to the Secretary of State for Environment, Food and Rural Affairs (Defra)
- responsibilities include:
 - flood and coastal risk management
 - navigation
 - fisheries
 - conservation and ecology
 - water quality and resources
 - climate change
- the agency provides technical advice on flood risk to local authorities and developers



How to check the flood zones for your site on the Council's website.

1. On the home page of www.spelthorne.gov.uk using the 'My Spelthorne' green tab on the right-hand side of the page select 'My maps'.
2. In 'current location' box click 'change' and type in address of property.
3. Select the tab 'Show Map Categories' on the left of the screen and click on 'Environment and Planning'.
4. Tick all three Flood Zone boxes. Flood zones relevant to your site (if any) will then appear on the map and you will be able to see if your site is affected by any of them.
5. There is a zoom facility on the left hand side of the map and if you 'left click' on the map and hold your mouse down this will enable you to 'pan' in any direction.
6. If you require an aerial view of the area select 'Aerial 2008' on the top right hand side of the map.

Flood Risk Assessments for residential extensions

This Appendix explains what a householder must do for the LPA to exceptionally allow an extension in Flood Zone 3b.

Detailed FRAs for extensions will only be required for proposals within Flood Risk Zone 3b. This is where there is a flood risk of up to 1 in 20 (5%). These are areas of particularly high risk not only because of the greater frequency of flood events but their severity in terms of high flow rates and depth of flood water. The potential impact of extensions in such situations will therefore be greater not only in terms of lost flood storage capacity but the impedance to the flow of flood water.

For Flood Zones 2 and 3a paragraph 4.56 explains the need for information in relation to the proximity to 'main rivers' and flood resilience measures.

Policy LO1(d) makes clear that development, including extensions, will not be allowed in Flood Risk Zone 3b. Paragraph 4.30 in this guidance does, however, allow for any existing structures on the site that are to be demolished to be taken into account in assessing whether an extension will result in a net loss of flood storage capacity. It will also be necessary to consider if the position of the proposed extension is such that it will protrude further into the path of fast moving flood water and result in a net increase in impedance to flood water flow. If there is either a net loss of flood storage capacity or net increase in impedance to the flow of flood water the proposal will be unacceptable.

There are some simple steps that anyone contemplating a development can take in assessing the likely acceptability of a proposal before embarking on the preparation of a formal flood risk assessment and detailed design of a scheme:

1. Check which flood risk zone the site is in – see the advice in Table 5 - Screening Assessments, which explains how to find out.
2. Make an initial assessment of whether it is likely there will be a net loss of flood storage capacity. This can be done by assessing the volume of the structures to be demolished and those to be constructed. It will be important to note that structures such as sheds and garages with a floor level close to ground level, where flood water would not normally be prevented from entering, would contribute little to additional flood storage capacity if removed. If there is clearly a net loss of flood storage capacity there is no point proceeding.
3. Make an initial assessment whether the structure is likely to protrude further into the path of flowing flood water than those structures to be removed. For an initial assessment it can be assumed that flood water will generally flow parallel to the river. If it is obvious that an extension is likely to cause a greater impedance to the flow of flood water by projecting out further into the path of fast moving flood water, again there is no point proceeding.

Only where a proposal is likely to meet the above requirements is it worth preparing detailed plans and an FRA.

To assess the flood risk implications of an extension the Council will require sufficient detailed information to identify:

1. The volume of those structures to be lost and gained to demonstrate there is no net loss of flood storage capacity. To make this calculation see points a to e in paragraph 4.62 of the main document.

2. There will be no greater impedance to the flow of flood water across the site than currently exists – information on projected flood flow at a site will need to be obtained from the EA.
3. The means of satisfactorily disposing of surface water from the roofs of the new structure (sustainable drainage).
4. Flood resistance and flood resilience measures appropriate to the extension.