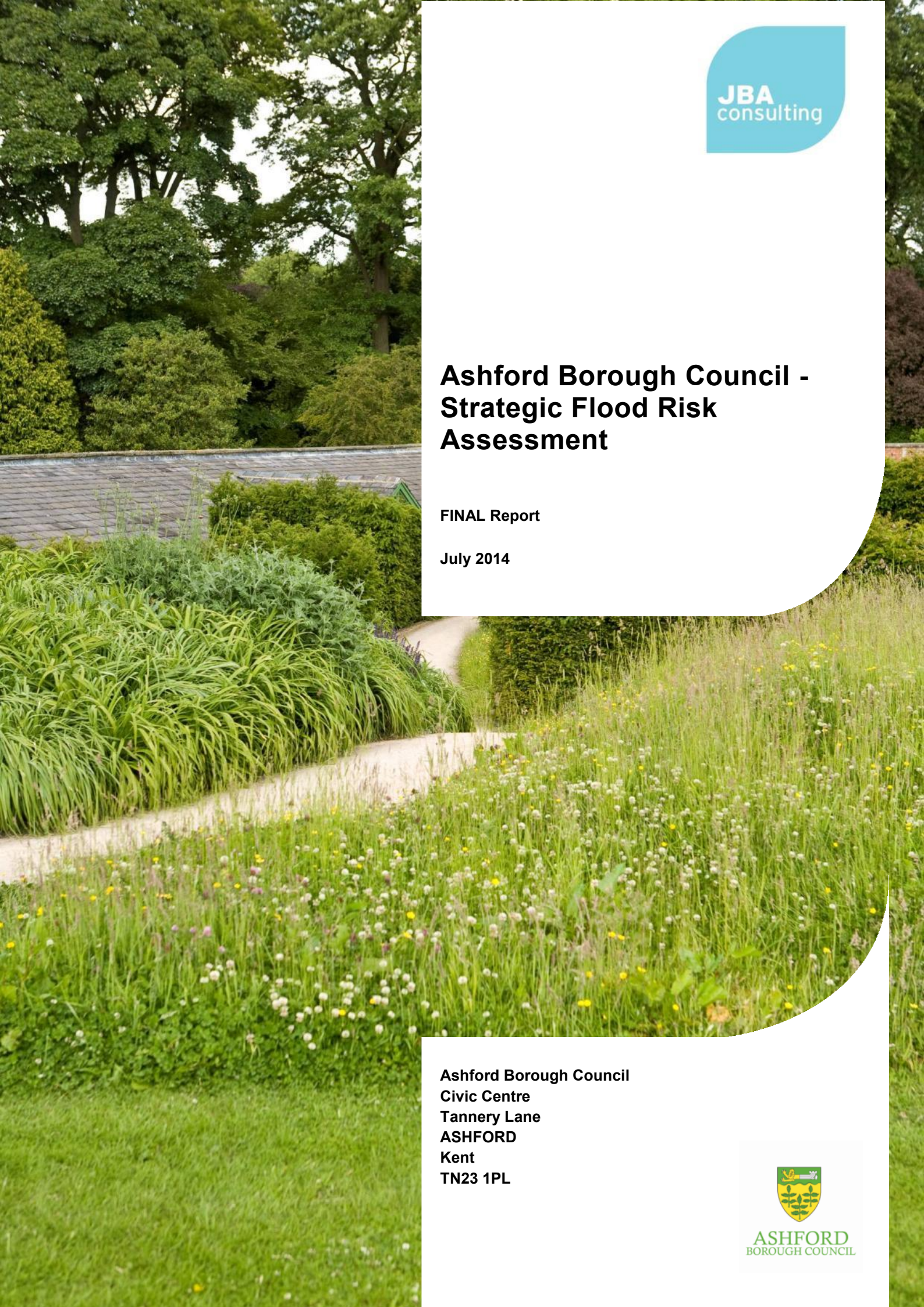


Ashford Borough Council - Strategic Flood Risk Assessment

FINAL Report

July 2014

Ashford Borough Council
Civic Centre
Tannery Lane
ASHFORD
Kent
TN23 1PL

JBA Project Manager

Jack Southon

Aberdeen House
South Road
HAYWARDS HEATH
West Sussex
RH16 4NG

Revision History

Revision Ref / Date Issued	Amendments	Issued to
Draft v1		Katy Wiseman Ashford Borough Council
Draftv2	Client and EA comments	Katy Wiseman Ashford Borough Council
Final Draft v3	Amendment to Appendix B	Katy Wiseman Ashford Borough Council
Final v4	Client comments	Katy Wiseman Ashford Borough Council
Final v5	Amendment to Executive Summary	Katy Wiseman Ashford Borough Council

Contract

This report describes work commissioned by Ashford Borough Council (reference PDS0120). The representative for the contract at Ashford Borough Council was Katy Wiseman.

Prepared by ..... Jack Southon BSc MSc FRGS MCIWEM C.WEM CSci CEnv

Chartered Senior Analyst | Team Leader

..... Margaret Moran LLM BSc Dip

Analyst

Reviewed by ..... Alastair Dale BSc PGDip MIAHR

Director

Purpose

This document has been prepared as a Strategic Flood Risk Assessment for Ashford Borough Council. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

JBA Consulting has no liability regarding the use of this report except to Ashford Borough Council.

Acknowledgements

We would like to thank everyone who has assisted in the development of this SFRA, including Katy Wiseman and Simon Cole from Ashford Borough Council, Barrie Neaves and Sam Howe from the Environment Agency, Andy Adams of Southern Water and Max Tant of Kent County Council.

Copyright

Carbon Footprint

A printed copy of the main text in this document will result in a carbon footprint of 313g if 100% post-consumer recycled paper is used and 399g if primary-source paper is used. These figures assume the report is printed in black and white on A4 paper and in duplex.

JBA is aiming to reduce its per capita carbon emissions.

Executive Summary

Context

This document replaces the Strategic Flood Risk Assessment (SFRA), published in 2006. The previous version of the SFRA was prepared to support Ashford Borough Council's (ABC) Core Strategy (2008) which set out the vision for planned development in the Borough. The focus of planned development at that time was on the Ashford Growth Area and this was reflected in the content of the previous version of the SFRA. The previous version of the SFRA was prepared in accordance with PPG25, which was subsequently superseded by PPS25 and more recently has been replaced by the National Planning Policy Framework (NPPF) (March 2012) and accompanying Planning Practice Guidance (March 2014). Moving forward the Council is in the process of formally reviewing their vision for development in the Borough and is replacing the Core Strategy with a Local Plan to encapsulate the agenda for development to 2030. This document updates the previous version of the SFRA for Ashford Borough; with reference to the following key changes that have occurred since the previous version of the SFRA was completed (2006).

Flood Risk in Ashford

There are numerous watercourses within Ashford Borough which are a source of risk. Ashford is at risk from the River Stour, which is split into the Upper, Middle, East Stour and Great Stour within the Borough. Wye is at risk of flooding from the Middle Stour. There are two flood storage reservoirs (Aldington on the East Stour and Hothfield on the Great Stour) that reduce the risk of fluvial flooding to Ashford town.

The River Beult catchment has a relatively shallow gradient and has fluvial flood risk from typically frequent but less severe flood events. Settlements affected by this watercourse and its tributaries include Bethersden, Smarden and Biddenden Green. The Rother and Romney Catchment are identified by a complex network of drains and there have been events recorded on Shirley Moor, Small Hythe and Rolvenden. Flooding from the Reading Sewer near Small Hythe Bridge and the Isle of Oxney has also been recorded.

Hamstreet is part of the Rother and Romney catchment and there are historic records of flooding at this location. It is situated at the confluence of the Spering Sewer and the Royal Military Canal. However, historical flooding at Hamstreet has been attributed to a combination of fluvial, surface water and groundwater sources. Many areas of the borough are also at risk from other sources of flooding, including ordinary watercourses, surface water, groundwater and sewers, which have caused problems in recent years.

Planned Development in Ashford

Ashford Borough has provided details of the 168 proposed site submissions at the time of preparing this SFRA. The sites submissions are concentrated around Ashford Town with some site submissions located in rural areas such as Tenterden, Woodchurch and Wye.

Impact of Development in Ashford

The cumulative area of all the proposed development sites identified for this study is 11.5 square kilometres, representing over 2% of the total area of Ashford borough, although this represents the total number of options and not the anticipated planned development. With careful planning supported by effective local policy, planned development presents a significant opportunity to introduce measures that will contribute to betterment of the current flood risk situation.

Mitigation Options

The scale of redevelopment being proposed in the next 5, 10, and 15 years presents an important opportunity to 'design-in' capacity for climate change mitigation into new development. The key opportunity for development or re-development of this scale is to build in additional capacity into systems to counter the predicted effects of climate change. This form of adaptation linked to new development is particularly important in densely developed urban areas. By requiring sites to mitigate today for the effects of 100 years of climate change it has the additional benefit of introducing local capacity in the present day systems. The mitigation

schemes that include provision for the level of service as will be required in 100 years will currently provide an augmented level of service under present day conditions.

Contents

Contents

List of Figures

List of Tables

Abbreviations and Definitions

Term	Acronym	Definition
Actual Risk		The risk posed to development situated within a defended area (i.e. behind defences), expressed in terms of the probability that the defence will be overtopped, and/or the probability that the defence will suffer a structural failure, and the consequence should a failure occur
Annual Event Probability	AEP	Expresses the probability of a flood event of a specific magnitude occurring in any one year. For example, the 1 in 100 year flood event is expressed as the 1% AEP; there is a 1% chance of it occurring within any given year.
Area Action Plan	AAP	Planning document to guide development in a specific area. Forms part of the Local Plan.
Area Benefiting from Defence	ABD	Those areas which benefit from formal flood defences in the event of flooding from rivers with a 1% chance in any given year or from the sea with a 0.5% chance in any given year. If the defences were not there, these areas would be flooded.
Areas Susceptible to Groundwater Flooding	AStGWF	National map produced by the Environment Agency showing areas susceptible to groundwater emergence.
Ashford Borough Council	ABC	Ashford is the local government borough in Kent for which this SFRA has been applied.
Ashford Integrated Water Management Strategy	AIWMS	The Ashford Integrated Water Management Strategy outlines how the organisations responsible for planning and managing water, within Ashford borough, will meet the constraints of growth predicted in Ashford Town.
Asset Information Management System	AIMS	Environment Agency's asset database
Brownfield		Brownfield (sites or land) is a term in common usage that may be defined as 'development sites or land that has previously been developed'.
Combined sewer overflow	CSO	In combined sewerage systems, foul drainage and surface water are conveyed in the same piped system. During rainfall, when flows in the combined sewer are high, excess flow is diverted to watercourses or ground in order to reduce the risk of combined sewer flooding. CSOs can be a significant source of pollution to watercourses.
Core Strategy	CS	Term no longer used to describe a Development Plan Document setting out the long-term spatial vision, strategic objectives and policies relating to future development of an area. Where they remain, the Core Strategy forms part of the Local Plan.
Defended Area		An area offered a degree of protection against flooding through the presence of a flood defence structure
Development Plan Documents	DPDs	Documents that make up the Local Plan and form part of the statutory development plan for the areas. DPDs must include the Local Plan and adopted Policies Map. All DPDs are subject to public consultation and independent examination.
Flood Alleviation Scheme	FAS	Works designed to provide protection from flooding.
Flood and coastal erosion risk management Grant in Aid	FCRMGiA	Central government funding to flood risk management authorities to pay for a range of activities including schemes that help reduce the risk of flooding and coastal erosion.
Flood Estimation Handbook	FEH	Provides current methodologies for estimation of flood flows for the UK
Flood Map for Surface Water	FMfSW	National map produced by the Environment Agency showing flood risk from surface water at the 30 year and 200 year return periods.
Flood Risk Assessment	FRA	A detailed site-based investigation that is undertaken by the developer at planning application stage
Flood Risk Management		The introduction of mitigation measures (or options) to reduce the risk posed to property and life as a result of flooding. It is not just the application of physical flood defence measures
Flood Storage Area	FSA	Area designed to store water in a flood and release it later when flood waters have subsided.
Flood Zone 1		Flood Zone 1 (Low Probability): This zone comprises land assessed as having a less than 1 in 1,000 Annual Exceedance Probability of river or sea flooding (<0.1%).
Flood Zone 2		Flood Zone 2 (Medium Probability): This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% - 0.1%) in any year.

Term	Acronym	Definition
Flood Zone 3a		Zone 3a (High Probability): This zone comprises land assessed as having between a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of sea flooding (>0.5%) in any year.
Flood Zone 3b		Zone 3b (Functional Floodplain): This zone comprises land where water has to flow or be stored in times of flood.
Floodplain		Any area of land over which water flows or is stored during a flood event or would flow but for the presence of defences
Fluvial Flooding		Flooding caused by high flows in rivers or streams exceeding the capacity of the normal river channel.
Formal Defence		A flood risk asset which is maintained by any party to fulfil a flood defence function in agreement with the Environment Agency.
Freeboard		A 'safety margin' to account for residual uncertainties in water level prediction and/or structural performance, expressed in mm
Functional Floodplain		An area of land where water has to flow or be stored in times of flood.
Greenfield		Greenfield (sites or land) is a term in common usage that may be defined as 'development sites or land that has not previously been developed'.
Historic Flood Map	HFM	National map produced by the Environment Agency showing historical flood extents.
Informal Defence		An asset which was not designed for flood defence and is not maintained for this purpose, but forms some flood defence function.
ISIS		One-dimensional river modelling software developed by Halcrow. Capable of steady and unsteady state simulation.
Lead Local Flood Authority	LLFA	Body responsible for managing flood risk from localised sources across the County and a developing a strategy for local flood risk management that encompasses all sources of flooding (Kent County Council)
LIDAR		Light Detection and Ranging. An airborne laser mapping technique producing precise elevation data.
Local Development Framework	LDF	This term has been replaced by the term 'Local Plan'. It was used to describe a portfolio of Local Development Documents that provide a framework for delivering the spatial planning strategy for the area.
Local Plan	LP	The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004. Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.
Local Planning Authority	LPA	The local authority area that is empowered by law to carry out a planning function.
Main River		Larger streams and watercourses, for which the Environment Agency is the designated body responsible for flood risk management.
Measure		A deliverable solution that will assist in the effective management (reduction) of risk to property and life as a result of flooding, e.g. flood storage, raised defence, effective development control and preparedness, and flood warning
Mitigation		The management (reduction) of flood risk
National Flood and Coastal Defence Database	NFCDD	A database, maintained by the Environment Agency, of fluvial and coastal assets. Flood defence assets are included, as are other assets with other functions such as footbridges on towpaths.
National Planning Policy Framework	NPPF	The NPPF sets out the Government's planning policies for England and how these are expected to be applied at a local level.
OfWAT		The Water Services Regulation Authority. The economic regulator of the Water Industry in England and Wales.
Ordinary Watercourses		All watercourses other than Main Rivers. The Lead Local Flood Authority is the designated body responsible for flood risk management.
Probability	1%	A measure of the chance that an event will occur. The probability of an event is typically defined as the relative frequency of occurrence of that event, out of all possible events. Probability can be expressed as a fraction, % or a decimal. For example, the probability of obtaining a six with a shake of a fair dice is 1/6, 16% or 0.166. Probability is often expressed with reference to a time period, for example, annual exceedance probability
Property Level Protection	PLP	Schemes that protect property from flooding at the property scale, for example installing flood barriers on doors, air brick covers etc.
Rapid Inundation Zone		An area immediately behind defences which, should they fail, will generate a combination of high velocities and flood depths that would cause a risk to life.

Term	Acronym	Definition
Residual Risk		The risk that inherently remains after implementation of a mitigation measure (option)
Return Period		The expected (mean) time (usually in years) between the exceedance of a particular extreme threshold. Return period is traditionally used to express the frequency of occurrence of an event, although it is often misunderstood as being a probability of occurrence.
Risk		The threat to property and life as a result of flooding, expressed as a function of probability (that an event will occur) and consequence (as a result of the event occurring)
Sewage Treatment Works	STW	A plant where wastewater from households and commercial premises is treated to remove contaminants to make suitable for safe disposal.
Sewer		A pipeline, usually underground, designed to carry foul sewage and/or surface water from buildings and paved areas associated with buildings in more than one curtilage (plot of land).
Site Specific Allocations	SSAs	Allocation of sites for specific or mixed-use development.
Standard of Protection	SoP	The return period to which properties are protected against flooding
Strategic Flood Risk Assessment	SFRA	The assessment of flood risk on a catchment-wide basis for proposed development in a borough
Supplementary Planning Documents	SPD	Supplementary Planning Documents or SPD support DPDs in that they may cover a range of issues, both thematic and site specific. Examples of SPD may be design guidance or development briefs. SPD may expand policy or provide further detail to policies in a DPD. They will not be subject to independent examination.
Surface Water Management Plan	SWMP	Projects to investigate local flooding issues such as flooding from sewers, drains, groundwater, and runoff from land, small watercourses and ditches that occurs as a result of heavy rainfall. Carried out through a partnership of all relevant stakeholders including local authorities, internal drainage boards, sewerage undertakers and the Environment Agency.
Sustainability Appraisal	SA	A Sustainability Appraisal is a systematic process to predict and assess the economic, environmental and social effects likely to arise from DPDs and SPDs, enabling each document to be tested and refined, ensuring that it contributes towards sustainable development.
Sustainable (Urban) Drainage System	SuDS	Current 'best practice' for new urban development that seeks to minimise the impact upon the localised drainage regime, e.g. through the use of pervious areas within a development to reduce the quantity of runoff from the site
Uncertainty		A reflection of the (lack of) accuracy or confidence that is considered attributable to a predicted water level or flood extent
Water Framework Directive	WFD	European Union directive designed to improve and integrate the way water bodies are managed throughout Europe

1 Introduction

1.1 Background

This document replaces the Strategic Flood Risk Assessment (SFRA), published in 2006. The previous version of the SFRA was prepared to support Ashford Borough Council's (ABC) Core Strategy (2008) which set out the vision for planned development in the Borough. The focus of planned development at that time was on the Ashford Growth Area and this was reflected in the content of the previous version of the SFRA. The previous version of the SFRA was prepared in accordance with PPG25, which was subsequently superseded by PPS25 and more recently has been replaced by the National Planning Policy Framework (NPPF) (CLG, March 2012) and accompanying National Planning Practice Guidance (CLG, March 2014).

Moving forward the Council is in the process of formally reviewing their vision for development in the Borough and is replacing the Core Strategy with a Local Plan to encapsulate the agenda for development to 2030.

This document updates the previous version of the SFRA for Ashford Borough; with reference to the following key changes that have occurred since the previous version of the SFRA was completed (2006):

- Changes to legislation, both relating to flood risk and planning policy, including the Flood and Water Management Act (2010), the National Planning Policy Framework (NPPF) (2012), the Localism Act (2011) and the Climate Change Act (2008); and new powers and responsibilities bestowed on Kent County Council as the Lead Local Flood Authority under the Flood and Water Management Act (2010) and their dependencies therefore with the Borough Council's local development and forward planning role.
- Changes to technical guidance, for example the Consultation on SuDS Regulations and Standards (2011), National SuDS Guidance (DEFRA), the forthcoming establishment of the LLFA as the SuDS Approving Body and National Planning Practice Guidance (2014).
- Change in focus on development in Ashford Growth Area to encompass a more holistic assessment of the Town Centre, Ashford Urban Area, and the Rest of the Borough.
- Improved knowledge of flood risk through modelling and other studies e.g. recent Level 1 SWMP featuring historic flooding information, Great Stour fluvial modelling study, Ashford model improvements, the availability of the updated Flood Map for Surface Water (uFMfSW); and the availability of Hazard Mapping.

The purpose of this refreshed version of the SFRA is to assess the extent and nature of flood risk and the implications for land use planning and this will help Ashford Borough Council locate potential development and infrastructure in areas with the lowest probability of flooding in accordance with the latest guidance and information. This SFRA has been completed to aid the preparation of the emerging Local Plan documents and exercises (e.g. Strategic Housing Land Availability Assessment). Where the content of the previous version of the SFRA has not changed it has been retained as far as possible.

1.2 Objectives

An SFRA is a planning tool that assists councils in their selection and development of sustainable site allocations away from vulnerable flood risk areas. The SFRA will assist the council to make the spatial planning decisions required to inform the forthcoming Local Plan for the period up to 2030.

The National Planning Policy Framework (NPPF) reinforces the responsibility of Local Planning Authorities (LPAs) to ensure that flood risk is managed effectively and sustainably as an integral part of the planning process, balancing socio-economic needs, the existing framework of landscape and infrastructure and flood risk. To this end, the key objectives of the SFRA are to:

- Provide a policy context for flood risk management, in general terms, from which flood risk issues can be considered.
- Assess flood risk from all sources within the Ashford Borough, as well as risks to and from the surrounding areas in the same catchment;
- Enable ABC to make informed decisions on flood risk when appraising options within the Sustainability Appraisal process;
- Enable ABC to make informed decisions on flood risk when allocating sites using the risk-based Sequential Test;
- Provide guidance on flood risk issues in the preparation of strategic land use policies in the Local Plan;
- Enable ABC to determine the acceptability of flood risk in relation to emergency planning capabilities.

1.3 About Ashford Borough

The study area comprises the whole of the administrative area of Ashford Borough Council. The study area is illustrated in Figure 1-1.

The borough is comprised of land that drains to the catchments of the Kentish Stour, the River Medway and the River Rother / Romney Marshes. The Kentish Stour catchment is the second largest catchment in Kent, which includes 255km of Main River, and discharges into the English Channel at Pegwell Bay, near Sandwich. Ashford is located at the confluence of five Main Rivers, the principal ones being the Great Stour and East Stour. Runoff from a portion of the borough drains to the River Beult which then discharges to the River Medway and the southern area of the borough drains to watercourses that discharge to the River Rother and Romney Marshes.

The physical geography of the catchments is dominated by the chalk of the North Downs, which forms both the main topographical feature and results in the baseflow dominated nature of many of the river channels. The catchments are largely rural in character and include some of the most productive agricultural land in Kent.

The geology of the catchments is predominantly Chalk, with outcrops of Gault Clay, Lower Greensand and Weald Clay along the south-west margins. The East Stour rises on the Weald Clay and is clay-bedded along most of its length. The Great Stour, however, rises on the permeable Lower Greensand and receives a large amount of its flow from Chalk springs at the foot of the North Downs. Average annual rainfall varies over the catchments and averages 750mm around the upper Stour, but is higher on the top of the North Downs.

Upstream of Ashford, annual surface runoff is strongly influenced by topography and geology. The Upper Great Stour receives some quick runoff from Gault Clay but is generally slower to respond to heavy rainfall than the East Stour and the smaller Aylesford Stream, Whitewater Dyke and the Ruckinge Dyke. This is because Gault and Weald Clays dominate their catchments.

Significant channelization measures have been limited to key points within urban areas, such as the Aylesford Stream, through Ashford and where the Great and East Stour flow beneath the Channel Tunnel Rail Link and conventional railway. Flow in the Great Stour and East Stour is influenced by the operation of the Hothfield and Aldington Flood Storage Reservoirs during flood events.

The River Beult has several sources within Ashford, including one at Woodchurch, it flows in a westerly direction where it is joined by the River Teise above Yalding (Maidstone).

The Rother Romney Catchment encompasses Hamstreet, Romney and Walland Marshes and the Rural Rother. Hamstreet covers the urban area to the confluence of Speringbrook Sewer and the Royal Military Canal. The catchment is characterised by its underlying clay geology which rapidly responds to extreme events. The Romney Walland Marshes are low lying and flat. The Royal Military Canal controls water movement within the Marshes.

Many areas of the borough are also at risk from other sources of flooding, including ordinary watercourses, surface water, groundwater and sewers, which have caused problems in recent years.

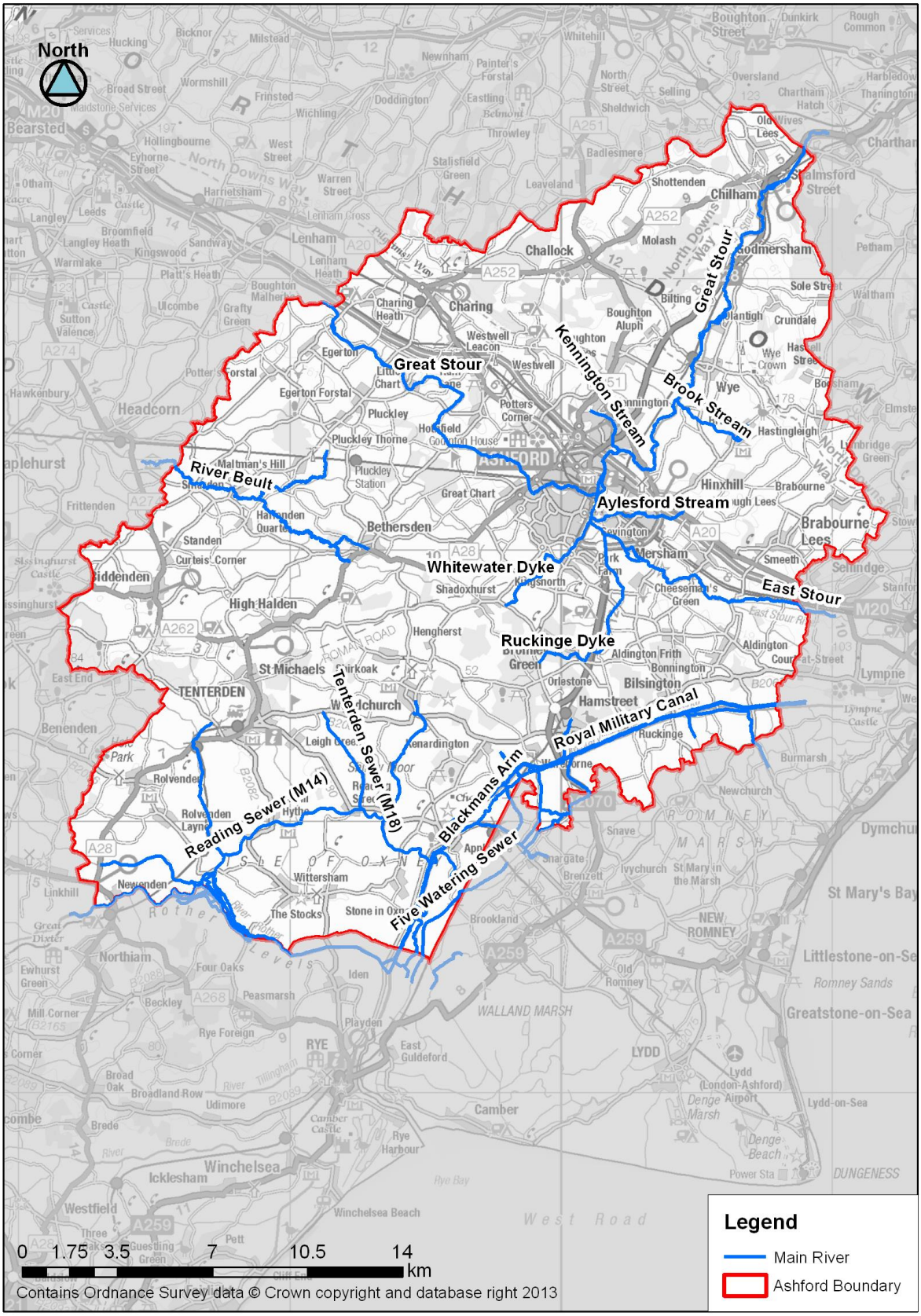


Figure 1-1: Study Area

1.4 How to Find What You Need in the SFRA

Use Table 1-1 to find the information that you need.

Table 1-1: SFRA Report layout

Section	Description of contents
Executive Summary	Non-technical summary of report identifying context, key sources of risk, key developments and potential impact and mitigation options.
1. Introduction	Define scope of content and give overarching guidance on where to find the information you want from within the document
2. Policy Context	Review and assessment of relevant and influential policies - National (NPPF, FWM Act, Localism Act etc.) Regional (ABC Local Plan, AIWMS (AWMP) etc.) together with other relevant policies (CFMP etc.)
3. Understanding Flood Risk in Ashford Borough	A review of influential flood characteristics, how the hazard are assessed and how climate change influences outcomes
4. Mapping and Risk based Approach	Summary of flood risk from all sources and how to use mapping and information to perform the Sequential and Exception Tests.
5. Overview of Future Development	Review of plan proposals identifying development within the next 5 years and over the whole plan period.
6. Strategic Options	Review and identification of strategic responses and Flood Risk Management issues related to all sources of flooding.
7. Review of Development Sites	Review of site specific flood risk issues for all proposed allocations. To include site specific FRA requirements, allocation policies, type and form of development.
8. Emergency Management	Provide guidance and contacts in the Emergency Services to assist in the preparation of evacuation plans as part of the site specific FRA
9. FRA requirements	Identifies the scope of technical assessment that must be submitted in FRA's supporting applications for new development
10. Outcomes	Reviews the implications of analysis undertaken for the SFRA

2 Policy Context

2.1 Introduction

The overarching aim of planning policy on development and flood risk is to ensure that flood risk is taken into account at all stages of the planning process. The purpose of this section of the report is to highlight and advise on the implications of the main changes to the planning framework and flood risk responsibilities since the publication of the previous SFRA in 2006.

Figure 2-2 gives an overview of the key strategic planning links for flood risk and associated documents. It shows how the Flood Risk Regulations and Flood and Water Management Act, in conjunction with the Localism Act's "duty to cooperate", introduce a wider requirement for the exchange of information and the preparation of strategies and management plans.

SFRAs contain information that should be referred to in responding to the Flood Risk Regulations and the formulation of local flood risk management strategies and plans. SFRAs are also linked to the preparation of catchment flood management plans (CFMPs), shoreline management plans (SMPs), surface water management plans (SWMPs) and water cycle strategies.

2.2 National legislation

2.2.1 Flood Risk Regulations (2009) and Flood and Water Management Act (2010)

Background

The Flood Risk Regulations transpose the EC Floods Directive into UK law and place responsibility upon all Lead Local Flood Authorities (LLFAs) to manage local flood risk. Kent County Council is the LLFA with local flood risk management responsibilities in Ashford borough. The Flood and Water Management Act (FWMA) received Royal Assent in April 2010. The FWMA aims to create a simpler and more effective means of managing the risk of flood and coastal erosion and implements Sir Michael Pitt's recommendations following his review of the 2007 floods.

Figure 2-1 sets out the requirements and timescales for implementing the requirements of the Directive as set out in the Flood Risk Regulations. The assessment, review and reporting is performed on a six year cycle.

Figure 2-1: Flood Risk Regulation Requirements

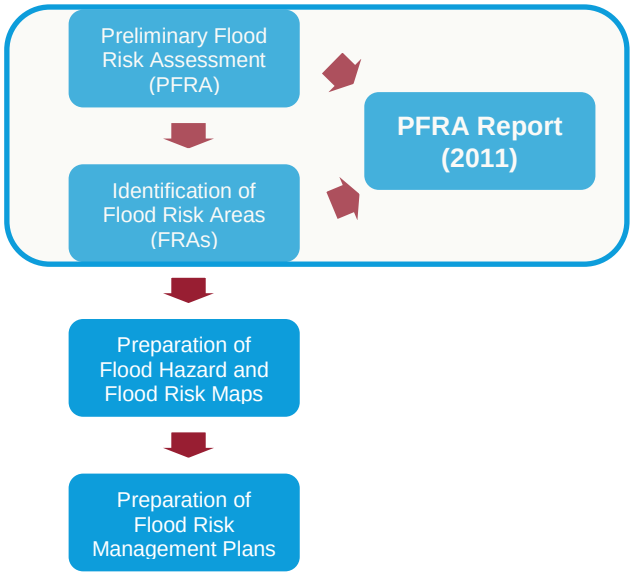
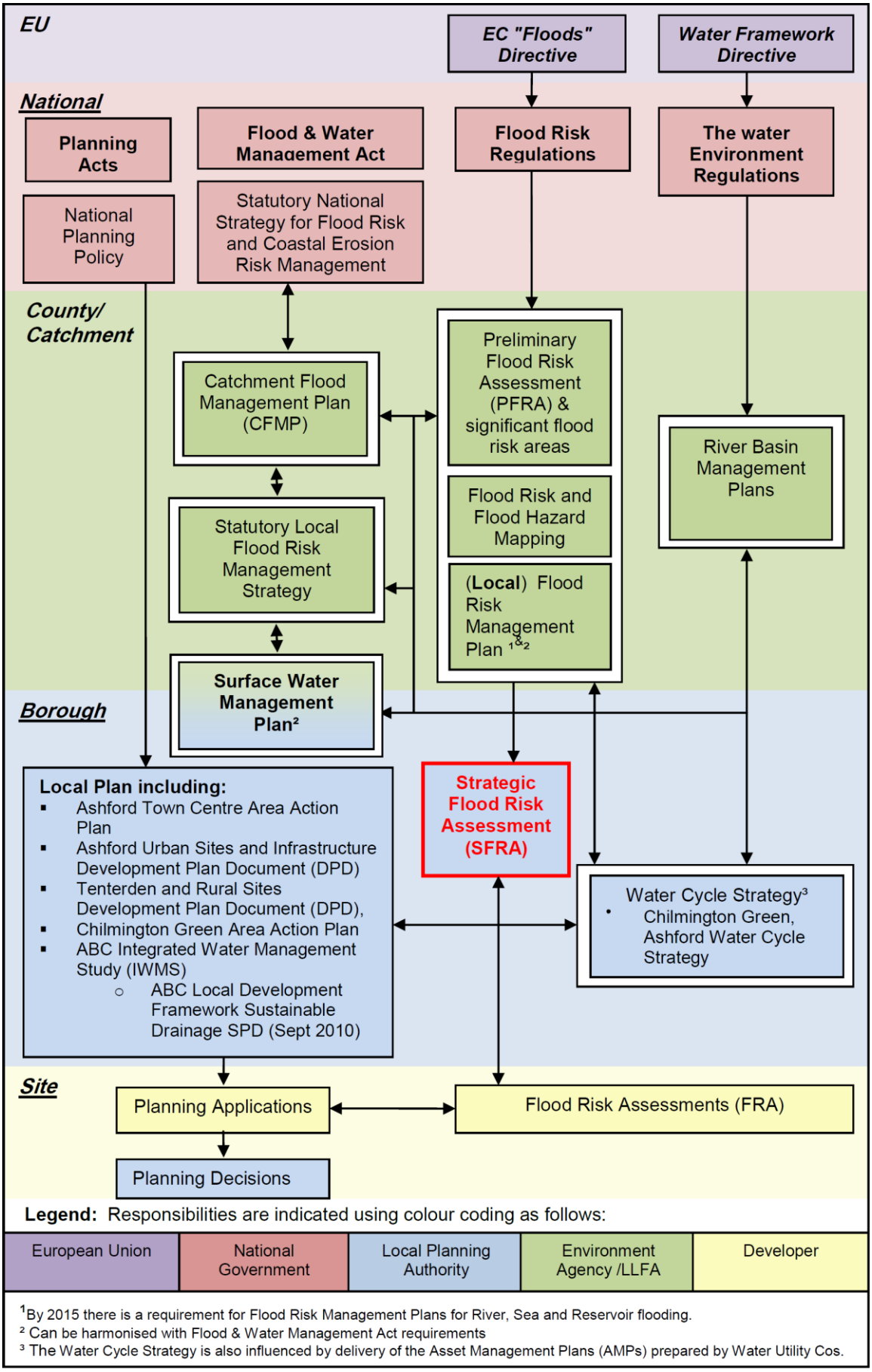


Figure 2-2: Strategic planning links and key documents for flood risk



The FWMA also calls for the establishment of a SuDS Approving Body (SAB) to be established by the LLFA. Schedule 3 (Sustainable Drainage) of the Flood and Water Management Act 2010 has not, at the time of writing, been enacted. It is anticipated that Schedule 3 will be enacted and processes in place (including provision of National Guidance) for commence in April 2015 and establishment of a SuDS Approval Body (SAB).

The SAB will be responsible for approving, adopting and maintaining drainage plans and SuDS schemes that meet new national standards for design, construction, operation and maintenance. SAB approval of drainage systems for new and redeveloped sites will be required before construction can commence. The responsibilities of the SAB are likely to rest with the LLFA (in this case, Kent County Council), although there is flexibility in the FWMA if it considered more effective for another body to assume responsibilities, as appropriate. It is understood that there are no plans to delegate the SAB role from KCC to SAB at the time of preparing this assessment.

The new and emerging responsibilities in Kent County Council under the Flood and Water Management Act and the Flood Risk Regulations are summarised in Table 2-1.

Table 2-1: Roles and Responsibilities in Ashford - Flood Risk

Risk Management Authority (RMA)	Strategic Level	Operational Level
Environment Agency	National Statutory Strategy Reporting and supervision (overview role)	**Main rivers, reservoirs (sea)** ● Preliminary Flood Risk Assessment (per River Basin borough) ● Identify Significant Flood Risk Area ●Flood Risk and Hazard Maps ●Flood Risk Management Plan
Lead Local Flood Authority (Kent County Council)	Input to national strategy. Formulate and implement local flood risk management strategy.	**Surface water, groundwater, other sources of flooding** ● Prepare and publish a PFRA ● Identify Flood Risk Areas ● Prepare Flood Hazard and Flood Risk Maps ● Prepare Flood Risk Management Plans (and Surface Water Management Plans) ● SuDS Approval Body (future) **Ordinary watercourse (outside of IDB drainage district)** ● Flood investigation, consents and enforcement (outside of IDB drainage district)
Internal Drainage Board	Drainage district	**Within drainage district** ●Consents and enforcement
ABC	Input to National and Local Authority Plans and Strategy (e.g. Local Plan documents) Ashford Borough Council Local Plan	●Local Planning Authority ●No Plans at this time for delegated powers from the LLFA

2.2.2 Localism Act

The purpose of this Act, which was given Royal Assent on 15 November 2011, is to shift power from central government back to the councils, communities and individuals. This Act allows councils to establish their own development plans to take account of local employment, housing and other land used in the plan making process.

In order for councils to achieve sustainable development practices, Provision 110 of the Act[1] was introduced to encourage cooperation during the planning process. This duty to cooperate requires Local Authorities to "engage constructively, actively and on an ongoing basis in any process by means of which development plan documents are prepared so far as relating to a strategic matter".

There are Neighbourhood Plans proposed within the borough (see Section 2.4.2).

[1] Localism Act (2011) Section 110: Duty to cooperate in relation to planning of sustainable development.

2.2.3 National Planning Policy Framework (NPPF)

The NPPF[2] was introduced in 2012 with its stated aim to simplify the planning system and to make it more accessible. In March 2014 specific National Planning Practice Guidance was published as a web-based facility to support the application of the NPPF policy[3]. The NPPF and Planning Practice Guidance replaced Planning Policy Statement 25: Development and Flood Risk (PPS25). The NPPF also promotes the need for sustainable growth and protection of the environment and provides guidance to help local planning authorities prepare local plans. These local plans require Strategic Flood Risk Assessments (SFRAs) that will help to develop policies on flood risk management with advice from the Environment Agency and other relevant bodies such as the LLFAs.

The NPPF states that "inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:

- “areas at risk of flooding” means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency;
- “flood risk” means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources."

The **Sequential Test** has been carried forward from PPS25. Details of the test are described in the NPPF and the accompanying National Planning Practice Guidance. This test must be performed when considering the placement of future development and for planning application proposals. The National Planning Practice Guidance gives detailed instructions on how to perform the test. These instructions on how to perform the test should be used with the following information from the SFRA:

- Identify the geographical area to be assessed, including a justification;
- Assess the sites chosen (including alternatives) on the Flood Zone maps that are provided with this assessment;
- Establish the risk of flooding from other sources using the maps in this SFRA; and
- Follow the instructions given in the National Planning Practice Guidance.

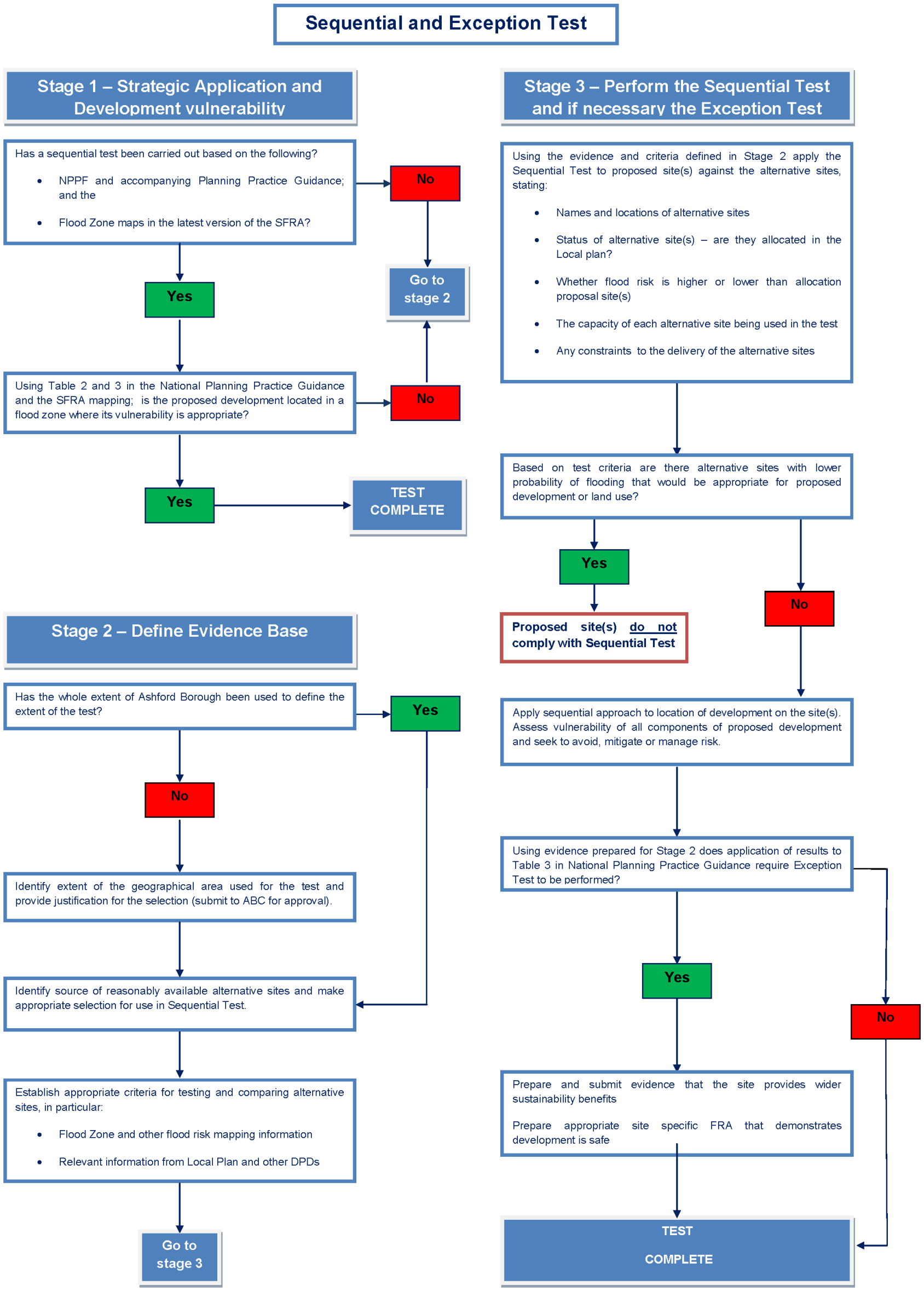
The National Planning Practice Guidance gives further information on how to apply the Sequential Test in relation to the allocation of land, individual planning applications, windfall sites, renewable energy projects, redevelopment of an existing single property and change of use.

The Sequential Test is used to direct all new development (through the site allocation process) to locations at the least risk of flooding, giving highest priority to locating development in Flood Zone 1. The SFRA provides further flood risk evidence which ABC can use to assess whether it is necessary to revisit/update the Sequential Test as it includes information on all sources of flood risk. The National Planning Practice Guidance recommends that the approach illustrated in Figure 2-3 is used by local planning authorities to apply the Sequential Test to planning applications located in Flood Zones 2 or 3. As shown there are three stages to the test and these have been summarised in Figure 2-3.

[2] Department of Communities and Local Government (2012) National Planning Policy Framework

[3] Department of Communities and Local Government (2014) National Planning Practice Guidance

Figure 2-3: Sequential and Exception Test



2.2.4 Association of British Insurers (ABI): Guidelines on Planning and Insurance in Flood Risk Areas for Local Authorities in England[4]

The National Flood Forum and the ABI have published guidance which aims to help local authorities in England when producing local plans and helps them deal with the planning application process in flood risk areas. The main guidelines are:

- Ensure strong relationships with technical experts on flood risk
- Consider flooding from all sources, taking account of climate change impacts
- Take potential impacts on drainage infrastructure seriously
- Ensure that flood risk is mitigated to acceptable levels for proposed developments
- Make sure local plans take account of all relevant costs and are regularly reviewed

2.2.5 Water Framework Directive

The Water Framework Directive (WFD) is designed to improve and integrate the way water bodies are managed throughout Europe. In the UK, much of the implementation work will be undertaken by competent authorities. It came into force on 22 December 2000, and was embedded in UK law (transposed) in 2003.

Under this Directive, many of the parties listed in Table 2-1 have a specific statutory duty to protect and address water quality issues within the area, and in many cases this will be considered as part of flood risk management or development proposals. For example, removing culverts, creating riparian zones, creating open space for water or implementing SuDS schemes. Further information on SuDS and the associated benefits of incorporating such schemes into development proposals is detailed in Section 8.17.

Environment Agency River Basin Management Plan [5]

A River Basin Management Plan is produced for each river basin district, every six years.

River Basin Management is a continuous process of planning (to develop River Basin Management Plans) and delivery. The Water Framework Directive introduces a formal series of 6 year cycles. The first cycle is to end in 2015 when, following further planning and consultation, the River Basin Management Plans will be updated and reissued.

River Basin Management Plans describe the river basin district, and the pressures that the water environment faces. They show what this means for the current state of the water environment in the river basin district, and what actions will be taken to address the pressures. They set out what improvements are possible by 2015 and how the actions will make a difference to the local environment - the catchments, estuaries, the coast and groundwater. Ashford lies predominantly in the South East River Basin District with a small portion (the catchment of the River Beult being a tributary of the Medway) falling in the Thames River Basin District. It is noted that the major strategic development site at Chilmington Green sits across both the Thames and South East Rivers River Basin District.

Water Cycle Strategy

An example of a WFD action may include the preparation of a Water Cycle Strategy (and Study) to provide Planning Authorities and development organisations with the necessary planning tools to ensure that growth can be supplied with sufficient water resources and wastewater treatment facilities, without detrimentally affecting the natural water cycle. The Environment Agency advocate that appropriate Water Cycle Strategies are included in regional and local plans, particularly in growth or high risk areas.

[4] Association of British Insurers and National Flood Forum (April 2012) Guidance on Insurance and Planning in Flood Risk Areas for Local Planning Authorities in England

[5] Environment Agency - River Basin Management Planning

2.3 County, borough and catchment level policy

2.3.1 Kent County Council Local Flood Risk Management (FRM) Strategy)[6]

In fulfilling the role of Lead Local Flood Authority (LLFA), Kent County Council (KCC) has new roles and responsibilities, duties and powers to enable it to manage flood risk from localised sources across the County and a duty to develop, maintain, apply and monitor a strategy for local flood risk management that encompasses all sources of flooding.

In general terms the Flood and Water Management Act (2010) requires Risk Management Authorities (RMAs) to act consistently with the Local FRM Strategy when undertaking flood risk management functions, except for water companies who will need to have regard to it.

The KCC strategy includes the following:

- Information on the risks of flooding from surface runoff, groundwater and ordinary watercourses in Kent.
- Information and guidance on the role of the public sector, private sector and individuals in flood risk management in Kent, how those roles will be delivered and how authorities will work together to manage flood risk.
- Details on local flood risk management objectives.
- Detail on the measures that will be undertaken to manage flood risk such as
    - broad scale strategic policies that are required to provide better management and/or coordination of flood risk information in the county;
    - more geographically specific actions such as a surface water management plan in one of the policy areas to provide more information; or
    - localised actions that will provide a specific scheme to manage flood risk.

2.3.2 Kent County Council - Preliminary Flood Risk Assessment[7]

The Flood Risk Regulations (the Regulations) required Kent County Council (as the LLFA) to prepare and publish a Preliminary Flood Risk Assessment (PFRA) on past and future flood risk from local sources of flooding. The Regulations also require the LLFA to identify significant Flood Risk Areas. The PFRA reports on significant past and future flooding from all sources except Main River and Reservoir (covered by Environment Agency). This exercise is performed on a six year cycle.

Key outputs from the first round Kent PFRA include:

- A broad-scale assessment of flood risk from local sources (surface runoff, groundwater and ordinary watercourses) across the county. Existing available data was gathered from a variety of sources. Incidents of past flooding from local sources were investigated.
- The identification of Ashford as an area potentially at risk of local flooding. Consequently KCC commissioned a Stage 1 Surface Water Management Plan to understand local flood risks within Ashford and what further work may be needed. The Ashford Stage 1 SWMP was completed in October 2013.

2.3.3 Ashford Core Strategy to the Local Plan[8]

Ashford Borough has an adopted Core Strategy 2008 which sets the strategic vision and scale of planned growth for housing and jobs within the borough to 2021. This document is currently being reviewed and preparation is underway on the formulation of a new Local Plan to 2030. This plan will describe how the most sustainable and deliverable pattern of growth can be achieved within the borough.

The existing development plan contains a number of local development documents in addition to the Core Strategy 2008. These are geographical or issue specific and together they deliver the

[6] Kent County Council (June 2013) - Kent Local Flood Risk Management Strategy
[7] Kent County Council (September 2011) Kent Preliminary Flood Risk Assessment
[8] Ashford Borough Council Core Strategy and Local Plan

spatial planning objectives and policies for the borough. These documents are referred to as Development Plan Documents (DPDs), Area Action Plans (AAPs) and Supplementary Planning Documents (SPDs).

The Adopted **Statutory Development Plans** in force for the borough are:

- Core Strategy 2008
- Town Centre Area Action Plan 2010
- Tenterden and Rural Sites Development Plan Document 2010
- Urban Sites and Infrastructure Development Plan Document 2012
- Chilmington Green Area Action Plan - Adopted July 2013
- Borough Local Plan 2000 (Saved Policies Only) including Supplementary Planning Guidance (SPG) such as, but not limited to:
    - SPG1 Green Corridor Action Plan Part 1
    - SPG1 Green Corridor Action Plan Part 2
    - SPG1 Green Corridor Action Plan Part 3

2.3.4 Local Plan Policies Map[9]

ABC is required to produce an adopted policies map in its Local Plan, showing the location of proposals in all current, adopted local plan documents on an ordnance survey base map. It reflects the most up-to-date spatial plan for the borough and is a live document meaning it is continually being updated as new policies are adopted.

2.3.5 Supplementary Planning Documents (SPD)[10]

Supplementary Planning Documents support the development plans. All matters covered in SPDs relate to policies or proposals in the Core Strategy, DPD, AAP or a saved policy from the Local Plan 2000. Ashford has a number of adopted SPD's which are used as material considerations when assessing planning applications. These include the following:

- Affordable Housing SPD
- Landscape Character SPD
- Residential Parking SPD
- Sustainable Design and Construction SPD
- Sustainable Drainage (SuDs) SPD
- Residential Space & Layout SPD
- Public Green Spaces and Water Environment SPD

2.3.6 Ashford Stage 1 Surface Water Management Plan[11]

A Surface Water Management Plan (SWMP) is a study to understand the flood risks that arises from local flooding, which is defined by the Flood and Water Management Act 2010 as flooding from surface runoff, groundwater, and ordinary watercourses.

SWMPs are led by a partnership of flood Risk Management Authorities (RMAs) who have responsibilities in relation to the management of local flood risk. The principal parties include the County Council, Local Authority, Environment Agency, Internal Drainage Boards (IDBs), Sewerage Undertaker and other relevant authorities.

The purpose of a SWMP is to identify what the local flood risk issues are, the effect they have and what options there may be to manage them. These options are presented in an Action Plan which lists the partners who are responsible for taking the options forward. The SWMP provides a full flood history for the study area which may include coastal and fluvial flood sources, the action plan only proposes measures to manage local flooding. The Action Plan is agreed by partners and is to be reviewed periodically.

[9] Ashford Borough Council - Local Policies Map

[10] Ashford Borough Council Supplementary Planning Documents

[11] Kent County Council (2013) Ashford Stage 1 Surface Water Management Plan

The Ashford Stage 1 SWMP was completed by Kent County Council in October 2013. Its purpose is to investigate the local flood risks in Ashford as part of their remit for strategic oversight of local flood risk management in Kent, conferred on them by the Flood and Water Management Act 2010. Ashford has been identified as an area potentially at risk of local flooding in the Preliminary Flood Risk Assessment[12]. The Stage 1 SWMP will increase the understanding of local flood risks and what further work/ actions may be necessary.

2.3.7 Catchment Flood Management Plan (CFMP)

A CFMP is a high-level planning strategy through which the Environment Agency works with the key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of fluvial flood risk. Ashford borough falls within three river catchments and, as such, three CFMP's as illustrated in Figure 2-4. It is important that any development undertaken within the borough is mindful of the flood risk management policies set by these high level strategic plans.

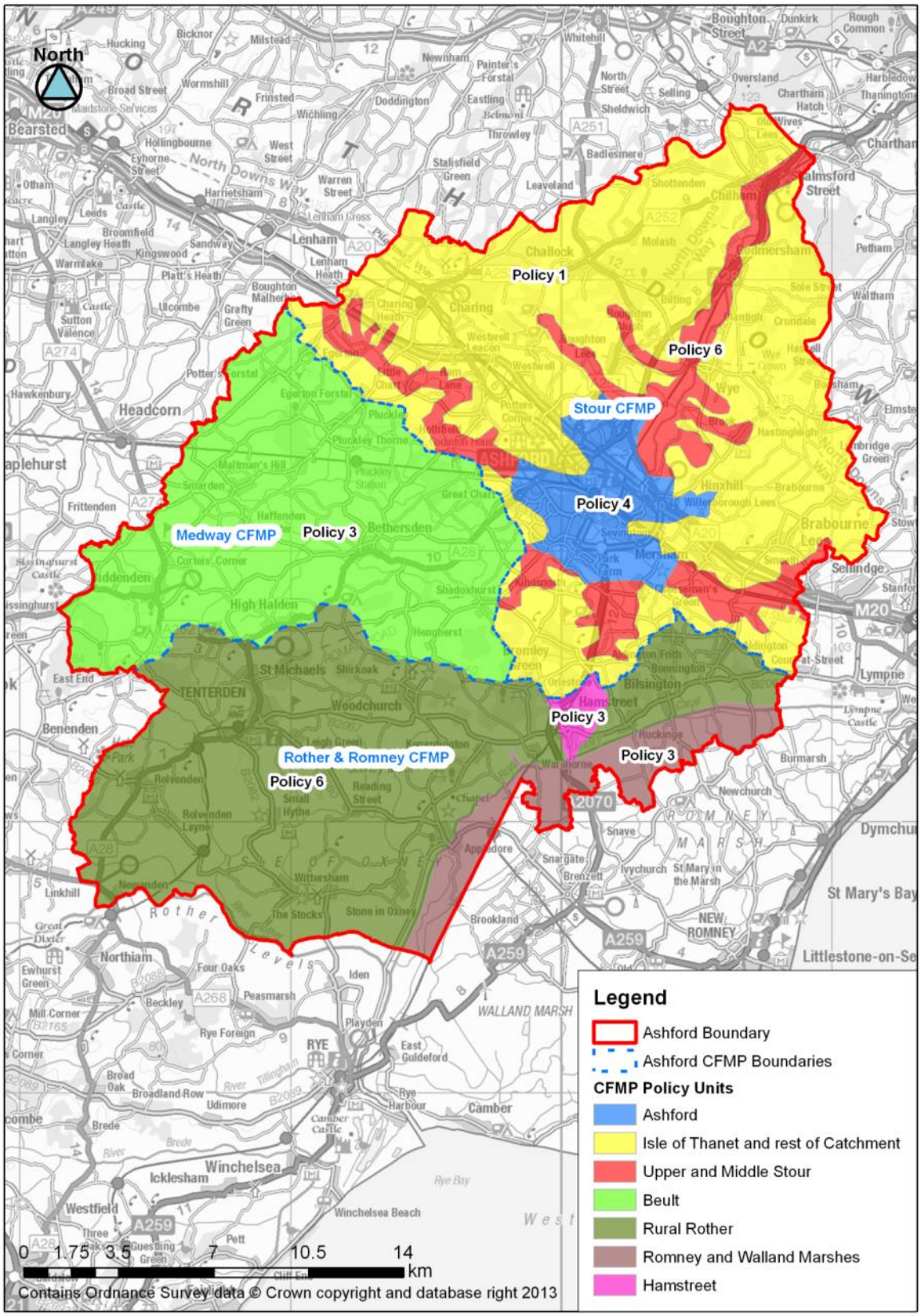
1. River Stour CFMP
2. Rother and Romney CFMP
3. River Medway CFMP

There are six pre-defined national policies provided in the CFMP guidance and these are applied to specific locations through the identification of 'Policy Units', see Figure 2-4. These policies are intended to cover the full range of long term flood risk management options in the catchment that can be applied to different locations. Within any CFMP six standard flood risk management policies has been applied to a policy unit. Figure 2-4 illustrates which policy has been applied to each policy unit:

- Policy 1 – No active intervention (including flood warning and maintenance). Continue to monitor and advise.
- Policy 2 – Reduce existing flood risk management actions (accepting that flood risk will increase over time).
- Policy 3 – Continue with existing or alternative actions to manage flood risk at the current level.
- Policy 4 – Take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).
- Policy 5 – Take further action to reduce flood risk.
- Policy 6 – Take action to increase the frequency of flooding to deliver benefits locally or elsewhere (which may constitute an overall flood risk reduction, e.g. for habitat inundation).

[12] Kent County Council (2011) Preliminary Flood Risk Assessment

Figure 2-4: CFMP Policy Units and Applicable Policies[13]



[13] Please note: the boundaries of the CFMP Policy Units have been digitised approximately from the relevant CFMP

2.4 Local level

2.4.1 Ashford Integrated Water Management Strategy (AIWMS)[14]

The Ashford Integrated Water Management Strategy outlines how the organisations responsible for planning and managing water, within Ashford Borough, will meet the constraints of growth predicted in Ashford Town. Under the Sustainable Communities Plan (July 2003), Ashford was designated as a strategic growth area for South East England. The Ashford's Future Study (December 2002) agreed a growth target of 31,000 new homes and 28,000 new jobs by 2031.

This document relies on the recommendations of the AIWMS with Ashford focused interpretations of existing policies and strategies in the form of:

- The 25-year Ashford Integrated Water Strategy (2006 - 2031)
- A 5-year Ashford Water Action Plan (AWAP) (2006 - 2011)

It should be noted that both the strategy and the action plan are non-statutory, however they draw together policies and strategies that are, or will be, statutory. The action plan is a living document and is revised every five years, and as such is currently in its second term covering the period 2011-2016. The strategy will be revised in pending improved knowledge and changing priorities. The strategy was adopted by the Ashford's Future Delivery Board on 12 July 2007.

2.4.2 Neighbourhood Plans[15]

Another requirement of the FWMA is for councils to provide technical advice and support on neighbourhood's development proposals. The Act enables local people to decide on the location of new housing and business developments through the use of neighbourhood plans.

There are currently four designated Neighbourhood Areas within the Ashford Borough at the Parishes of Wye with Hinxhill, Rolvenden, Bethersden and Boughton Aluph & Eastwell. More information is available on Ashford Borough Councils 'Neighbourhood Planning' WebPages.

[14] Environment Agency on behalf of Ashford's Future (2007) Ashford Integrated Water Strategy 2006-2031

[15] Ashford Borough Council Neighbourhood Planning

3 Understanding Flood Risk in Ashford

3.1 Historic Flooding

In Ashford Borough, during the 1960's and 1970's there were a number of instances of widespread flooding of both rural and urban areas from the headwater tributaries of the River Stour. As a result of further flooding from the Great Stour around Ashford in 1985 and 1986, two flood storage reservoirs upstream of Ashford were constructed. The reservoirs became operational in 1989 (Aldington) and 1991 (Hothfield) and provide a level of flood alleviation to Ashford.

In Autumn 2000, there were three major flood events in the Upper Stour basin. One was reported to be the worst flood in Kent since 1927 in many areas. Aldington and Hothfield reservoirs were unable to completely empty between these three events, and during the third event, Aldington Reservoir over spilled. A second over-spilling of Aldington reservoir occurred in the spring of 2001.

Notwithstanding these local problems with reservoir capacity, there was only limited flooding reported downstream of the reservoir and in Ashford. The Agency Autumn 2000 Floods Review (Environment Agency, 2001) shows that the floods were less serious in the Upper Stour basin than elsewhere in Kent and suggests that these events may have had a return period as low as 1 in 25 years.

Historically, Ashford has been particularly vulnerable to fluvial flooding since run-off from the higher ground converges into the town via the East Stour, the Great Stour, Ruckinge Dyke, Whitewater Dyke and Aylesford Stream; all of these being designated 'main' rivers.

Over the last 50 years the catchment has been subject to regular flooding, with notable events occurring in 1947, 1967, 1968, 1972, 1973, 1979, 1985, 1986, 1988, 1998, 2000, 2001 and the recent winter 2013-14 period.

Until the construction of the Ashford Flood Alleviation Scheme, the confluence of the two principal rivers, the Great Stour and East Stour, used to flood regularly - on average twice a year - to a depth of about 0.3 metres in the car park of the Stour Centre. Other flooding 'hotspots' included:

- the railway sidings and sports ground at Hythe Road;
- Beaver Road;
- South Stour Avenue;
- the area around Sevington Bridge;
- Flood Street, Mersham
- Victoria Park;

As a result of heavy rainfall flooding has occurred in Sevington and South Willesborough on several occasions, most notably in 1967 and 1972. An improvement scheme was designed to protect against flooding under rainfall conditions having a statistical frequency of once in 100 years in each and every year. The scheme consists of channel improvements to the Aylesford Stream, including concrete banks, and the reconstruction of five over-river crossings.

In recent years there have been further incidents of flooding within Ashford Borough, the Stage 1 Surface Water Management Plan (SWMP)[16] has recorded these events from not only main river fluvial sources, but also from local ordinary watercourses, surface water, sewer and groundwater sources.

December 2013 to February 2014 was the wettest two month period since 1910. The regional area received 258% of the Long Term Average rainfall and the local rivers responded to this rainfall with repeated high flow peaks. Aldington Flood Storage Reservoir stored water for nearly a month (28 January 2013 – 24 February 2014). On 15 February, the reservoir reached full capacity with 1.31Mm^3 stored.

[16] Kent County Council (2013) Ashford Stage 1 SWMP - Appendix B (Summary Sheets and Mapping) and Appendix C Flood History Table

The Hothfield Flood Storage Reservoir stored water on three separate occasions. Peak storage was achieved on 15 February when the reservoir was 75% full and storing 1.32 Mm^3. Undoubtedly the reservoirs successfully prevented widespread flooding in Ashford.

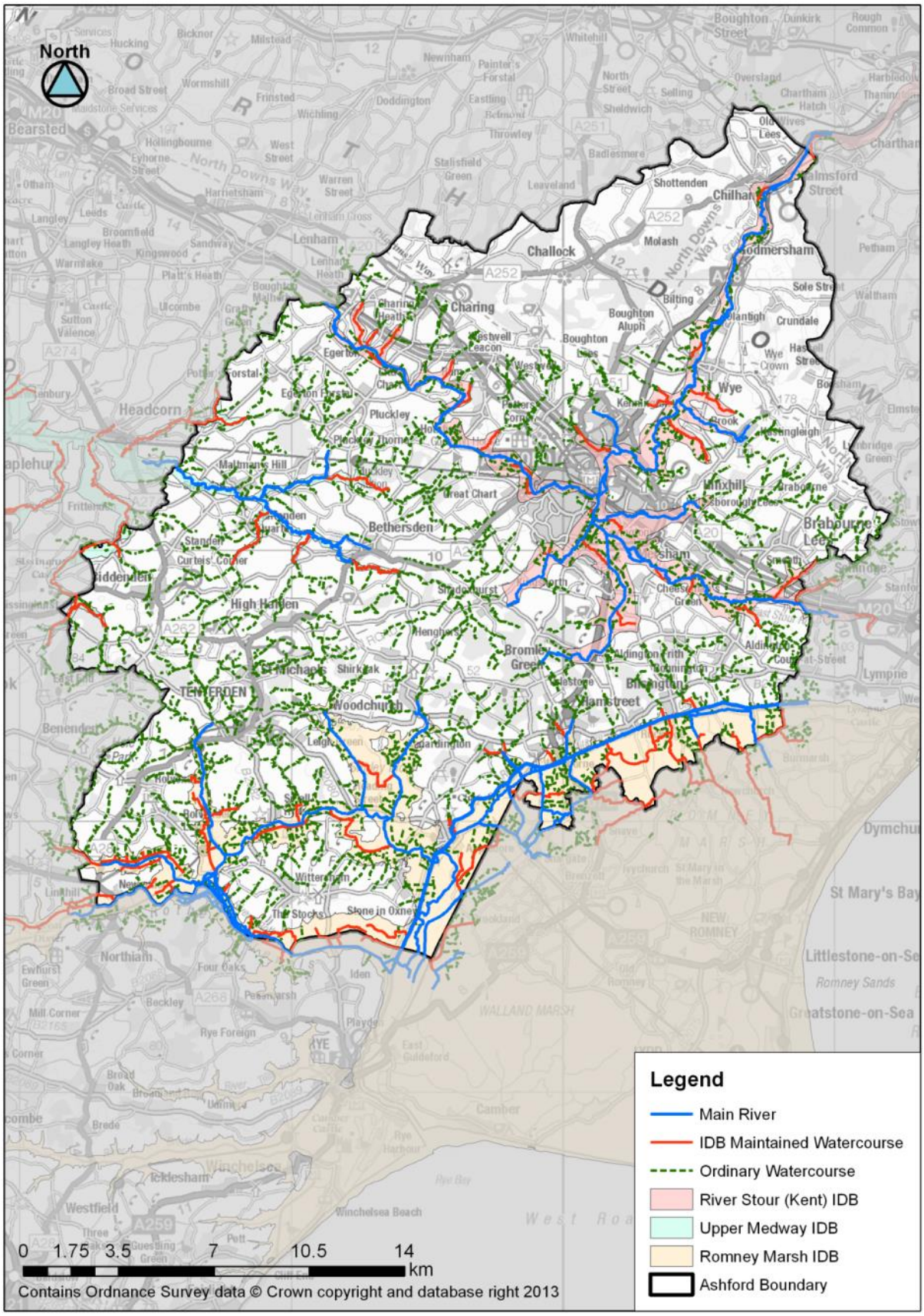
In addition to the engineered flood storage areas, natural floodplains, in areas such as the Willesborough Dykes, provided valuable floodwater storage. And the provision of sustainable drainage systems in new development contributed to reducing the rate of surface water run-off.

According to the Environment Agency, there was little, if any, property flooding in Ashford.

3.2 Watercourses

From a review of available mapping and reference to flood risk management data the 'watercourses' shown in Table A1 have been identified within Ashford Borough. The location of these watercourses is shown in Figure 3-1.

Figure 3-1: Watercourses

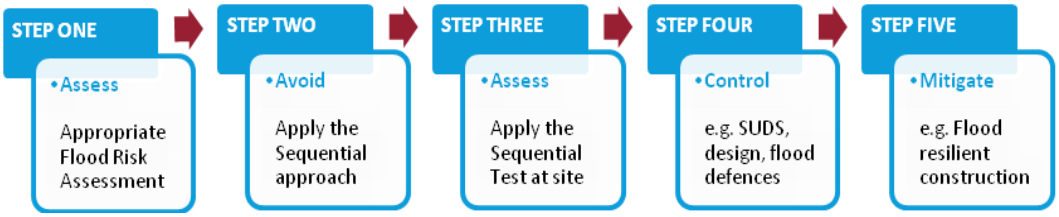


3.3 How Flood Risk is Assessed

3.3.1 General Assessment of Flood Risk

The SFRA adopts the flood risk management hierarchy advocated in the NPPF as summarised in Figure 3-2.

Figure 3-2: Flood Risk Management Hierarchy



This hierarchy underpins the risk based approach and must be the basis for making all decisions involving development and flood risk. When using the hierarchy, account should be taken of the source pathway receptor model illustrated in Figure 3-3 and explained as follows.

- The nature of the flood risk (the ***source*** of the flooding);
- The spatial distribution of the flood risk (the ***pathways*** & areas affected by flooding);and
- The degree of vulnerability of different types of development (the ***receptors***).

The source pathway receptor model should include consideration of the effects of climate change. Any site submission should reflect the application of the Sequential Test using the maps and guidance in this SFRA. The information in this SFRA should be used as evidence and where necessary reference should also be made to relevant evidence in the documents described in Section 2 and the process for Sequential and Exception testing. The Flood Zone maps and flood risk information on other sources of flooding contained in this SFRA should be used where appropriate to apply the Sequential Test.

Where other sustainability criteria outweigh flood risk issues, the decision making process should be transparent. Information from this SFRA should be used to justify decisions to allocate land in areas at high risk of flooding. To that end, this report contains information on the level of flood hazard for 'site submissions' that will be assessed by ABC as part of a site selection process in moving toward allocations for the Local Plan.

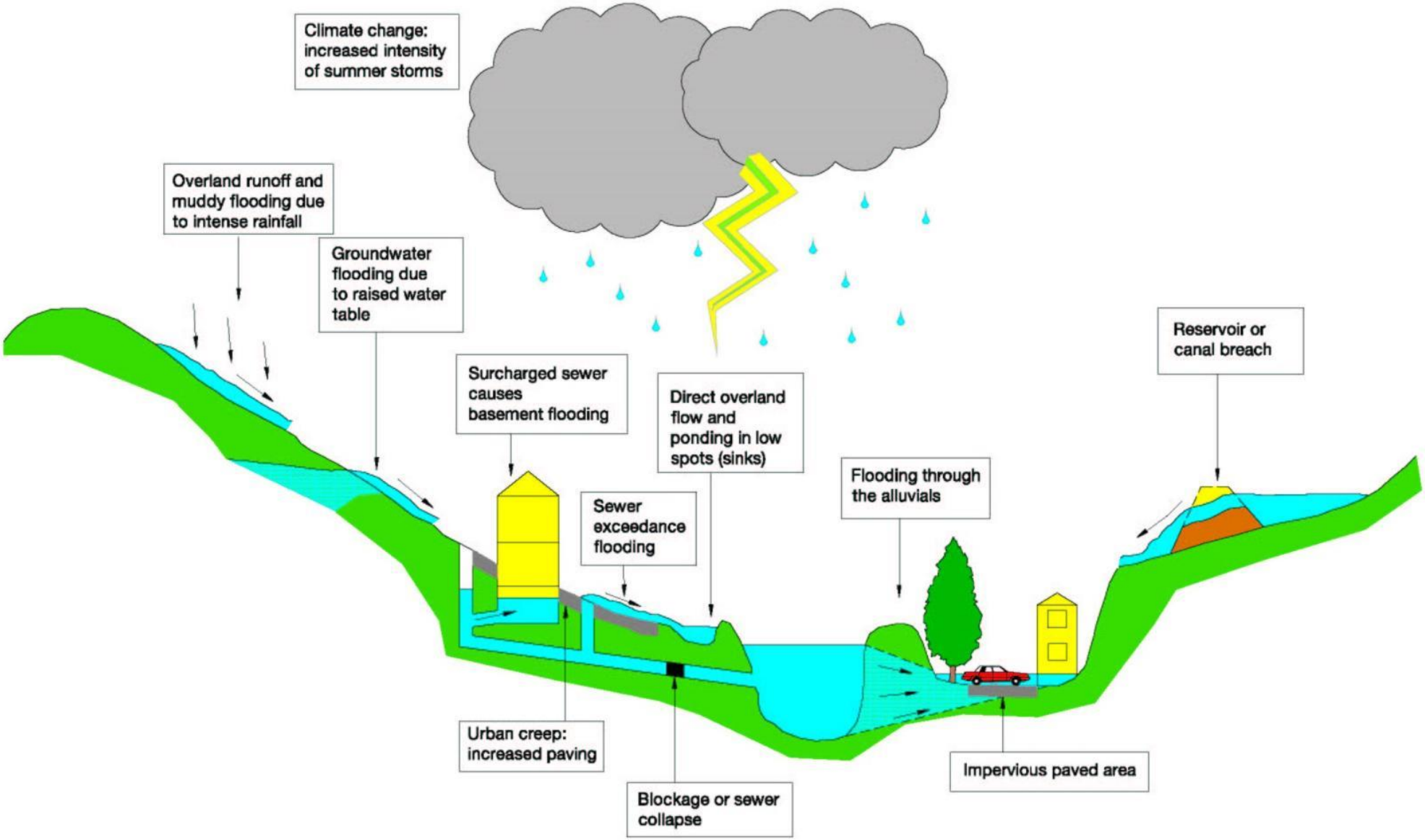
The basis for all decision making in flood risk is to first understand the risk and then identify responses to that risk so that it is effectively managed. The SFRA provides detailed information that must be supplemented, where necessary, with more detailed information contained in the other relevant documents described in this chapter.

In accordance with the Planning Practice Guidance the level of detail of the assessment is based on the requirement to understand the consequences of flooding. When proposed development can be located on land with a low probability of flooding as required by the sequential test a 'level 1 assessment is appropriate. When it is necessary to locate development on land with a higher probability of flooding more information is required to inform the decision, as given by a level 2 assessment. Typically the additional information requires a more detailed understanding of:

- Flood probability
- Flood depth
- Flood velocity
- Rate of onset of flooding and rate of rise
- Duration of flood

When appropriate this SFRA contains Level 1 and Level 2 information.

Figure 3-3: Source Pathway Receptor flooding from varying sources



3.3.2 Definitions

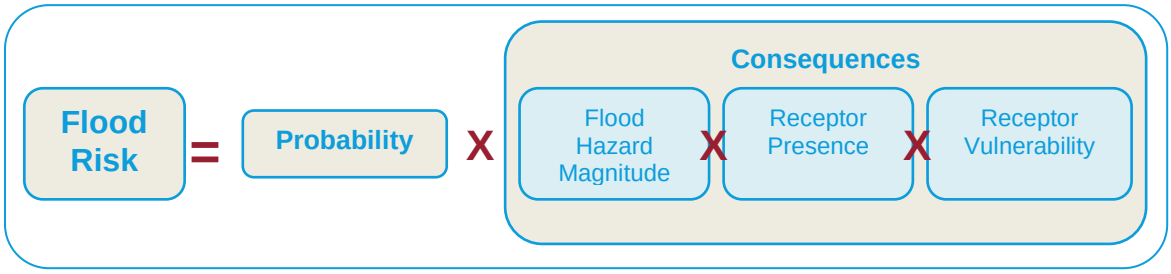
A flood is formally defined in the Flood and Water Management Act[17] as

"including cases where land not normally covered by water becomes covered by water and can be the result of water emanating from a number of sources".

Flood risk can be described as the combination of the statistical probability of a flood occurring and the scale of its potential consequences, whether inland or on the coast, and includes consideration of development located outside of the river and tidal flood risk areas. Thus it is possible to define flood risk as:

Flood Risk = (Probability of a flood) x (scale of the consequences)

On that basis it is useful to express the definition as follows:



Using this definition it can be seen that

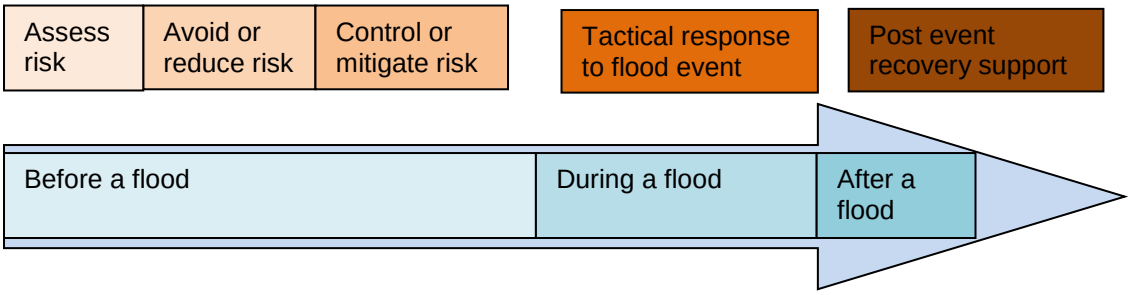
- **Increasing the probability or chance of a flood being experienced increases the flood risk.** In situations where the probability of a flood being experienced increases gradually over time, for example due to the effects of climate change, then the magnitude of the flood risk will increase.
- **The severity of the consequences can increase the flood risk.**
- **Flood Hazard Magnitude**: If the direct hazard posed by the depth of flooding, velocity of flow, the speed of onset, rate of rise in flood water or duration of inundation is increased (for example due to the effects of climate change), then the consequences of flooding, and therefore risk, is increased. New development can potentially increase the hazard if it causes an increase in surface runoff flows.
- **Receptor presence**: The consequences of a flood will be increased if there are more receptors affected. Additionally, if there is new development that increases the probability of flooding or increased density of infrastructure then consequences will also be increased.
- **Receptor vulnerability**: If the vulnerability of the people, property or infrastructure is increased then the consequences are increased. For example, old or young people are more vulnerable if they are caught up in a flood event.

3.3.3 Using SFRA Risk Information

The SFRA contains information that can be used at strategic, operational and tactical levels, as shown in Figure 3-4.

[17] Flood and Water Management Act (2010) text available at http://www.legislation.gov.uk/ukpga/2010/29/contents

Figure 3-4: Use of SFRA information



The SFRA contains information that should be used for planning in advance of flooding. It also provides information on the effects of flood events (due to failure or overtopping of defences). The SFRA flood risk data should be updated following flood events. The assessment of flood risk in the SFRA is primarily based on the following three types of information:

3.3.4 Flood Zones

The SFRA includes maps that show the Flood Zones. These zones describe the land that would flood if there were no defences present. NPPF identifies the following Flood Zones and these are used in the ABC SFRA to provide an assessment of flood risk to selected sites from rivers and sea flooding. A concept diagram showing the classification of Flood Zones graphically is included in Figure 3-5 below. Table 3-1 includes a description and discussion of land use. A fuller discussion of Flood Zones and their relation to planning policy can be found in the NPPF and the accompanying Planning Practice Guidance.

Figure 3-5: Definition of Flood Zones

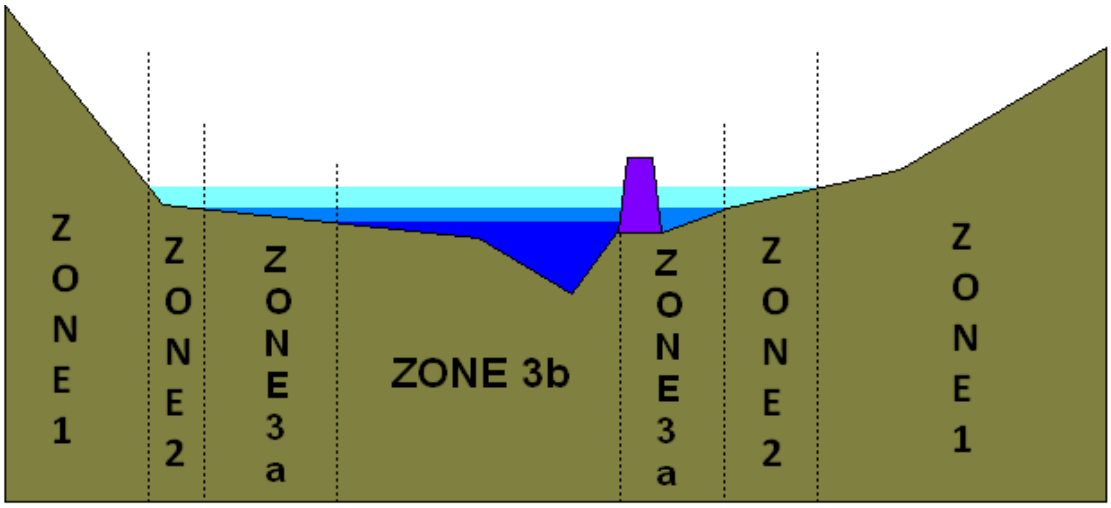


Table 3-1: Flood Zone descriptions

	Probability	Description	Suitable Development*
Zone 1	Low	This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).	All uses of land
Zone 2	Medium	This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (0.1% - 1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.1% – 0.5%) in any year.	Water compatible, less vulnerable and more vulnerable uses of land and essential infrastructure are appropriate. The highly vulnerable uses are only appropriate if the Exception Test is passed.
Zone 3a	High	This zone comprises land assessed as having a greater than 1 in 100 annual probability of river flooding (>1.0%) or a greater than 1 in 200 annual	Water compatible and less vulnerable uses of land are appropriate. More vulnerable and essential infrastructure should only be permitted

	Probability	Description	Suitable Development*
		probability of flooding from the sea (>0.5%) in any year.	if the Exception test is passed. Highly vulnerable uses should not be permitted.
Zone 3b	Function Floodplain	This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes.	Water compatible and essential infrastructure that has to be there is permitted. Essential infrastructure should pass the Exception Test and be designed and constructed to meet a number of flood risk related targets. Less vulnerable, more vulnerable and highly vulnerable uses should not be permitted.

New development should, whenever possible, be placed in Flood Zone 1. The Flood Zones are indicative of the potential undefended floodplain. Allocating sites in Flood Zone 1 means that future development is not reliant on fluvial or coastal flood defences. This negates the requirement of committing future generations to costly long term expenditure, which becomes unsustainable in light of the effects of climate change. However, developers should be aware that the runoff from development on Flood Zone 1 land can potentially cause an increase in the probability of flooding. Information in the SFRA should be used to address this issue.

3.3.5 Actual Flood Risk

If it has not been possible for all future development to be situated in Flood Zone 1, then a more detailed assessment is needed to understand the implications of locating proposed development in Flood Zones 2 or 3. This is accomplished by considering information on the "actual risk" of flooding. The assessment of actual risk takes account of the presence of flood defences and provides a picture of the safety of existing and proposed development. It should be understood that the standard of protection afforded by flood defences is not constant and it is presumed that the required minimum standards for new development are:

- Residential development should be protected for its lifetime against river flooding with an annual probability of 1% in any year; and
- Residential development should be protected for its lifetime against sea flooding with an annual probability of 0.5% in any year.

The assessment of the actual risk should take the following issues into account:

- The level of protection afforded by existing defences might be less than the appropriate standards and hence may need to be improved if further growth is contemplated;
- The flood risk management policy for the defences will provide information on the level of future commitment to maintain existing standards of protection. If there is a conflict between the proposed level of commitment and the future needs to support growth, then it will be a priority for the Flood Risk Management Strategy to be reviewed;
- The standard of safety must be maintained for the intended lifetime of the development (assumed to be 100 years for residential development). Over time the effects of climate change will erode the present day standard of protection afforded by defences and so commitment is needed to invest in the maintenance and upgrade of defences if the present day levels of protection are to be maintained; and
- The assessment of actual risk can include consideration of the magnitude of the hazard posed by flooding. By understanding the depth, velocity, speed of onset and rate of rise of floodwater it is possible to assess the level of hazard posed by flood events from the respective sources. This assessment will be needed in circumstances where consideration is given to the mitigation of the consequences of flooding, or where it is proposed to place lower vulnerability development in areas that are at risk from inundation.

Those using this version of the ABC SFRA should refer to the Environment Agency's National Flood and Coastal Defence Dataset (NFCDD) for details on the standard of protection of defences. The NFCDD is not available as an online resource and therefore the EA should be contacted in order to obtain this information.

3.3.6 Residual Risk

Residual risk refers to the risks that remain in circumstances where measures have been taken to alleviate flooding. It is important that these risks are quantified to confirm that the consequences can be safely managed and "cliff edge" effects are not present. The residual risk can be:

- The effects of a flood with a magnitude greater than that for which the defences or management measures have been designed to alleviate. This can result in over-topping of flood banks, failure of flood gates to cope with the level of flow or failure of pumping systems to cope with the incoming discharges; or
- Failure of the defences or flood risk management measures to perform their intended duty. This could be breach failure of flood embankments, failure of flood gates to operate in the intended manner or failure of pumping stations.

The assessment of residual risk demands that attention be given to the vulnerability of the receptors and the response to managing the resultant flood emergency. In this instance, attention should be paid to the characteristics of flood emergencies and the roles and responsibilities during such events.

3.4 Understanding Flooding in Ashford

3.4.1 Introduction

Flood Risk has been assessed by performing a review of the following existing analyses, hydrological assessment and hydraulic modelling, see Table 3-2.

Table 3-2: Previous Flood Risk Studies

Hydraulic Model
Ashford Fluvial Model Outputs 2012
Hamstreet EA Fluvial Model Outputs 2011
Romney Marsh Tidal Modelling Outputs 2009
River Beult Fluvial Modelling Outputs 2007
Great Stour JBA Fluvial Model Outputs 2013 – Wye to Thanington

3.4.2 Description of Principal Flood Areas and Mechanisms

Fluvial

There are numerous watercourses within Ashford Borough which are a source of risk, see Table A1 and Figure 3-1. Ashford is at risk from the River Stour, which is split into the Upper, Middle, East Stour and Great Stour within the Borough. Wye is at risk of flooding from the Middle Stour. There are two flood storage reservoirs (Aldington on the East Stour and Hothfield on the Great Stour) that reduce the risk of fluvial flooding to Ashford town.

The River Beult catchment has a relatively shallow gradient and has fluvial flood risk from typically frequent but less severe flood events. Settlements affected by this watercourse and its tributaries include Bethersden, Smarden and Biddenden Green.

The Rother and Romney Catchment are identified by a complex network of drains and there have been events recorded on Shirley Moor, Small Hythe and Rolvenden. Flooding from the Reading Sewer near Small Hythe Bridge and the Isle of Oxney has also been recorded.

Hamstreet is part of the Rother and Romney catchment and there are historic records of flooding at this location. It is situated at the confluence of the Spering Sewer and the Royal Military Canal. However, historical flooding at Hamstreet has been attributed to a combination of fluvial, surface water and groundwater sources.

Surface Water

The historical records describe a pattern of flooding dispersed throughout the borough and have been described further within the Ashford Stage 1 SWMP. For the most part surface water flooding is attributed to heavy rainfall overloading carriageways, drains/ gullies. In other instances, the cause of flooding was perceived to be from blocked drains/ gullies which in some circumstances was a result of receiving watercourses impeding free discharge from surface water drains and gullies. In some instances the camber/ topography of the road/ highway is not aligned to promote efficient surface water drainage.

Sewer

Southern Water provided records of historical flooding within Ashford Borough. The data presented the number of events that occurred within a particular post code. An indication was given within the records as to whether the event flooded properties internally, externally or whether it was within the curtilage of a property. Flooding was described predominantly as hydraulic overload of sewer or an overloaded pumping station.

3.5 Possible Responses to Flooding

3.5.1 Assess

The first response to flooding must be to understand the nature and frequency of the risk. The assessment of risk is not just performed as a "one off" during the process, but rather the assessment of risk should be performed during all subsequent stages of responding to flooding. The detail of the assessment should be commensurate with the appropriate level of detail pertaining to the proposal (e.g. for a site level FRA it would be expected that a high level of detail was included).

3.5.2 Avoid

If possible and appropriate the hazard should be avoided. If it is possible to place all new growth in areas at a low probability of flooding then the flood risk management considerations will relate solely to ensuring that proposed development does not increase the probability of flooding to others. This can be achieved by implementing SuDS systems and other measures to control and manage surface run-off. In some circumstances it might be possible to include measures within proposed growth areas that reduce the probability of flooding to others and assist existing communities to adapt to the effects of climate change. In such circumstances the growth proposals should include features that can deliver the necessary levels of mitigation so that the standards of protection and probability of flooding are not reduced by the effects of climate change. In Ashford Borough Council, consideration should be given not only to the peak flows generated locally by new development but also to the volumes generated during longer duration storm events since these volumes have the potential to exacerbate flood levels in the river system.

3.5.3 Substitute, Control and Mitigate

These responses all involve management of the flood risk and thus require an understanding of the consequences (the magnitude of the flood hazard and the vulnerability of the receptor).

There are opportunities to reduce the flood risk by lowering the vulnerability of the proposed development. For instance changing existing residential land to commercial uses will reduce the risk provided that the residential land can then be located on land in a lower risk flood zone.

Flood risk management responses in circumstances where there is a need to consider growth or regeneration in areas that are affected by medium or high probability flood risk will include:

- Strategic measures to maintain or improve the standard of flood protection so that the growth can be implemented safely for the lifetime of the development (must include provisions to invest in infrastructure that can adapt to the increased chance and severity of flooding presented by climate change);
- Design measures so that the proposed development includes features that enables the infrastructure to adapt to the increased probability and severity of flooding, whilst ensuring that new communities are safe and that the risk to others is not increased (preferably reduced);
- Flood resilient measures that reduce the consequences of flooding to infrastructure so that the magnitude of the consequences is reduced. Such measures would need to be considered alongside improved flood warning, evacuation and welfare procedures so that occupants affected by flooding could be safe for the duration of a flood event and rapidly return to properties after an event had been experienced.

It would be necessary to address the required commitment and provisions for the long term management and maintenance of all measures to control and mitigate flooding, where they have to be deployed.

4 Mapping and Risk based Approach

4.1 Summary of Mapping for All Sources of Flood Risk

The sections in this chapter summarise the assessment that has been undertaken of flood risk in Ashford borough for all sources of flooding.

4.1.1 Hydraulic River Modelling

Flood risk based on results from modelling of the 'watercourses' described Table 4-1 was considered as part of this SFRA.

Table 4-1: Hydraulic Models

Title	Watercourse	Type	Responsible Party	Representation
Hamstreet EA Fluvial Model Outputs 2011	Spering brook Sewer	Main River	Environment Agency	ISIS-ESTY-TUFLOW model
Ashford Fluvial Model Outputs 2012	Great Stour, Bethersden Stream	Main River	Environment Agency	ID - 2D linked ISIS -TUFLOW model
Romney Marsh Tidal Modelling Outputs 2009	Coastal	Tidal	Environment Agency	2D TUFLOW model
River Beult Fluvial Modelling Outputs 2007	River Beult	Main River	Environment Agency	ISIS
Great Stour Fluvial Model Outputs 2013	Great Stour including Bethersden Stream	Main River	Environment Agency	ID - 2D linked ISIS -TUFLOW model
Flood Zone Improvements 2010	Various	Main River	Environment Agency	JFlow+
Rest of Catchment National Flood Outlines (Various)	Various	Main River	Environment Agency	JFlow

4.1.2 Surface Water

The updated Flood Maps for Surface Water (uFMfSW) - follows on the FMfSW map and aims to provide an improvement on the representation of surface water flood risk across England and Wales. The uFMfSW was used in relation to the identification of potential surface water flood risk in Ashford borough. Another key benefit of the uFMfSW is that unlike the existing national surface water maps it provides a full depth and hazard output to allow for the assessment of the variation of risk within the surface water flood outline.

4.1.3 Ground Water

Groundwater flood risk was considered through review and analysis of the following datasets

- Bedrock geology
- Superficial deposits
- Areas Susceptible to Groundwater Flooding (AStGWF), a strategic scale map showing groundwater flood areas on a 1km square grid
- Source Protection Zones (SPZs)[18]

[18] Groundwater maps are available at http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=groundwater

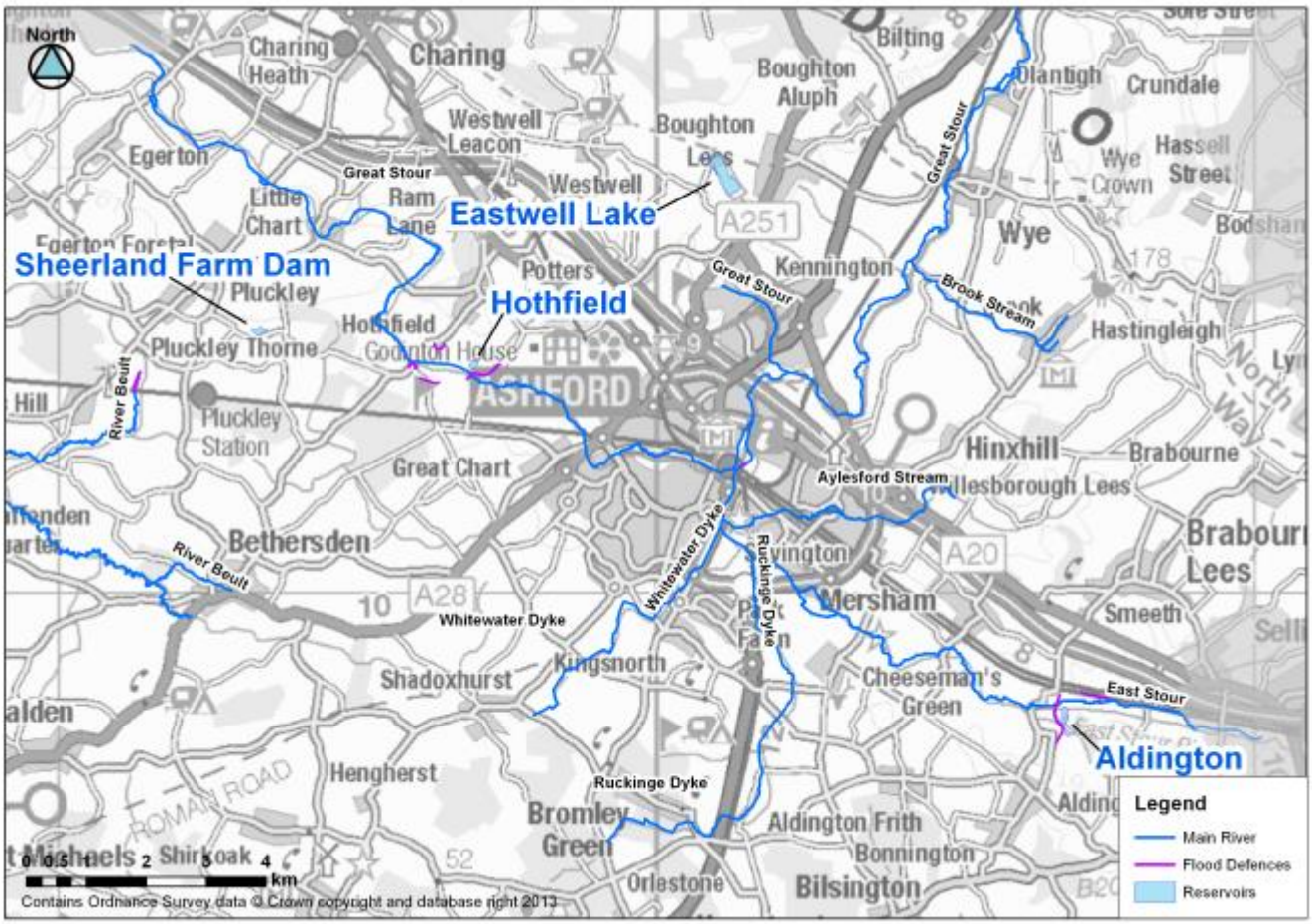
4.1.4 Reservoir Inundation Mapping

National Reservoir Inundation Maps (NRIMs) have been provided by the Environment Agency to inform this study. The following reservoirs are considered in this assessment.

Table 4-2: Reservoirs

Reservoir Name	Owner	Location
Hothfield	Environment Agency	596898, 143644
Aldington	Environment Agency	606611, 138053
Eastwell Lake	Goodman	601357, 146601
Sheerland Farm Dam	Highwood	593319, 144284

Figure 4-1: Reservoirs and flood defences



4.2 Other Relevant Flood Risk Information

The mapping prepared for this version of the SFRA provides information on

- the extent of flooding;
- the depth of flooding;
- the velocity of flood water; and
- The hazard from floodwater.

It should be noted that users of this SFRA should also refer to other relevant information on flood risk, as this is published and becomes available, where this is appropriate. Other information that should be referred to includes:

- The Kent County Council's Preliminary Flood Risk Assessment (PFRA)
- The Ashford Stage 1 Surface Water Management Plan (SWMP)

- Updates to the Ashford Integrated Water Management Strategy
- Hazard and Risk Mapping prepared for the Flood Risk Regulations
- Asset Information Management System (AIMS)
- National Receptor Dataset (NRD)

Information produced by the Environment Agency on how to challenge Flood Maps and Flood Zones included within the SFRA is included in Appendix D.

In addition reference can be made to the relevant South Eastern and Thames River Basin Management Plans with respect to water quality and resources.

5 Overview of Future Development

5.1 Introduction

At the time of preparation of this version of the SFRA, Ashford Borough Council, adopted Core Strategy (2008), which sets the strategic vision and planned growth for housing and jobs within the borough to 2021, was being formally reviewed and is to be replaced by a new Local Plan to 2030. It is anticipated that this new plan will be in place by 2015.

A Strategic Housing and Employment Land Availability Assessment (SHELAA) is being prepared by ABC to assess land availability within the Borough. To aid this process, ABC undertook a 'call for sites' in July to September 2013 asking landowners / developers to make the Council aware of any land available for development. This resulted in 168 sites being submitted to the Council, these will form part of the SHELAA assessment process. This SFRA tables the 'site submissions' in Appendix B and assesses the flood risk at these sites to inform the decision making process.

5.2 Site Submission summary sheets and maps

Flood risk from all sources has been described in more detail for each site submission. This information is provided in a 'summary sheet' format in Appendix C. Each summary sheet also gives further information about the implications for development. The following information is provided for each site:

- Basic site information (area, type of site, % of site in each Flood Zone)
- Description of sources and mechanisms of flooding
- Flood Zone and functional floodplain map, Flood hazard map, Climate change impact map, Flood defences and residual risk map
- Surface water flooding map
- Surface water drainage information (soil type and SuDS suitability)
- Infrastructure types permitted
- Requirement for Exception Test
- Site-specific development control advice (including for example recommended finished floor levels, access and egress, requirements for SuDS)
- Recommendations for further modelling as part of a site-specific FRA.

Maps showing the available flood risk information are provided with this report in Appendix E:

- Map No. 01 - EA Statutory Main Rivers within Ashford Borough
- Map No. 02 - EA Flood Zone Map: Flood Zone 3a, Flood Zone 3b, Flood Zone 2, the 1% AEP (1 in 100 year) plus climate change and existing flood defences
- Map No. 03 - 1% AEP (1 in 100 year) Fluvial and 0.5% (1 in 200 year) AEP Coastal Flood Depth map
- Map No. 04 - 1% AEP (1 in 100 year) Fluvial and 0.5% (1 in 200 year) AEP Coastal Flood Hazard map
- Map No. 05 - 1%+CC AEP (1 in 100 year +CC) Fluvial Flood Depth and 0.5%+CC AEP (1 in 200 year +CC) Coastal Flood Depth map
- Map No. 06 - 1%+CC AEP (1 in 100 year +CC) Fluvial Flood Hazard and 0.5%+CC AEP (1 in 200 year +CC) Coastal Flood Hazard map
- Map No. 07 - 0.1% AEP (1 in 1000 year) Fluvial and 0.1% (1 in 1000 year) AEP Coastal Flood Depth map
- Map No. 08 - 0.1% AEP (1 in 1000 year) Fluvial and 0.1% (1 in 1000 year) AEP Coastal Flood Hazard map
- Map No. 09 - Areas Susceptible to Groundwater Flooding - a strategic scale map showing groundwater flood areas on a 1km square grid; based on the underlying superficial and bedrock geology.

- Map No. 10 - uFMfSW (updated Flood Map for Surface Water) 3.33% AEP (1 in 30 year)
- Map No. 11 - uFMfSW (updated Flood Map for Surface Water) 1% AEP (1 in 100 year)
- Map No. 12 - EA Historic Flood Map

5.3 Site flood risk hierarchy

To aid ABC in the preparation of their emerging local plan, their site submissions have been categorised into low (minor constraint), medium (constraint) and high risk (major constraint). This is based on the percentage coverage of the site submission within Flood Zone 3, Flood Zone 2, the updated Flood Map for Surface Water (uFMfSW) and the Historic Flood Map (HFM), see Appendix B. Appendix B also highlights where a site submission is within 8m of a watercourse (indicating potential risk from ordinary watercourses which are not included in the Flood Zones). Where local evidence of flooding has been found this has been briefly described in Table B1.

Where a high percentage (greater than 50%) of a site submission is within Flood Zone 3 (a/b) the site submission is classified as having a 'major constraint'. Where the coverage of Flood Zone 3 is between 50 and 10%; or is covered by Flood Zone 2; or the Historic Flood Map (HFM); the potential development site is classified as having a 'Constraint'. Where the coverage of Flood Zone 3 is less than 10%, or where flood risk has been identified by the updated Flood Map for Surface Water (uFMfSW) or is within 8m of a watercourse, a site submission has been classified as having a 'minor constraint'.

Table B1 indicates that the majority of site submissions have some flood risk. Of the 168 site submissions:

- Ten are indicated to have a major constraint
- Thirty six are indicated to have a constraint
- Ninety four have a minor constraint
- Twenty eight are considered to have no constraint with respect to flood risk

These designations assume that appropriate measures are incorporated in the site design.

6 Strategic Options

The assessment described in this section identifies opportunities for the implementation of strategic measures to meet the needs of sustainable development. This strategic approach must encompass both local scale events and the cumulative effects of the local change on a larger catchment scale. The principle adopted involves a holistic approach to solving potential effects, rather than seeking to identify piecemeal solutions at individual sites. This proposed approach is then aligned with the principles endorsed by DEFRA as enshrined in the Resilience Partnership Funding arrangements[19].

As discussed in Section 3, there are a number of areas within the boundaries of Ashford Borough that are predicted to be at risk from flooding from a range of different sources. In order to ensure that growth and development in Ashford is sustainable, flood mitigation measures need to be considered for the borough and the wider area which may involve cross boundary co-operation. This section provides a high level overview of potential opportunities for mitigation in Ashford Borough, and considers the potential strategic responses to address key flood risk issues in the borough. It is noted that strategic flood storage provisions have already been implemented at Hothfield and Aldington.

One of the most significant local sources of flood risk in Ashford Borough is from surface water; the recent SWMP undertook a review of location specific actions which are considered in the following sections.

6.1 Proposed Development Sites

Ashford Borough has provided details of the 168 proposed site submissions at the time of preparing this SFRA. Figure 6-1: shows how the proposed development sites are distributed within the Ashford borough. It can be seen that the sites submissions are concentrated around Ashford Town with some site submissions located in rural areas such as Tenterden, Woodchurch and Wye. The cumulative area of all the proposed development sites identified for this study is 11.5 square kilometres, representing over 2% of the total area of Ashford borough. These sites represent a significant opportunity for betterment of the current flood risk situation.

6.2 Catchment Flood Management Plan

As discussed in Section 2.3.7, Ashford borough falls into three CFMPs and seven policy units, six of which contain site submissions, see Table 6-1 and Figure 6-1:.

1. River Stour CFMP
2. Rother and Romney CFMP
3. River Medway CFMP

[19] Flood and Coastal Resilience Partnership Funding: Defra policy statement on an outcome-focused, partnership approach to funding flood and coastal erosion risk management (Defra, 23 May 2011)

Table 6-1: Proposed Development Sites and CFMP Policy Units

CFMP	Policy Unit	Policy	Number of development sites	Combined area of development sites (km2)	% of Policy Unit area* covered by development sites
Medway CFMP	Beult	3[20]	36	1.1	0.9
River Stour CFMP	Isle of Thanet and rest of Catchment	1[21]	51	4.9	2.6
River Stour CFMP	Upper and Middle Stour	6[22]	23	2.3	5.1
River Stour CFMP	Ashford	4[23]	20	2.1	7.9
Rother & Romney CFMP	Rural Rother	6	36	1.1	0.7
Rother & Romney CFMP	Hamstreet	3	2	0.1	2.6
Rother & Romney CFMP	Romney and Walland Marshes**	3	0	0	0

* area within ABC
Where sites fall across more than 1 Policy Unit they are listed under the policy that contains the site's centroid to avoid double counting.
**For clarification, there are no proposed development sites located within the 'Romney and Walland Marshes Policy Unit.

6.2.1 Medway CFMP - Beult

The Beult policy unit has been identified as a Policy 3 area within the Medway CFMP. Policy 3 covers areas of low to moderate risk where the current regime is described as managing flood risk effectively.

The sources of fluvial flood risk defining this policy unit area within Ashford Borough is the Beult and its tributaries. The Beult system includes the Bethersden Steam which is a source of flood risk through Bethersden.

Thirty six site submissions are located within this policy unit, covering 1.1 km² which represents less than 1% of the policy unit area within Ashford Borough.

6.2.2 River Stour CFMP - Isle of Thanet and rest of Catchment

Isle of Thanet and rest of Catchment policy unit has been identified as Policy 1 within the River Stour CFMP.

The CFMP describes there is little or no flood risk within this policy unit. However, opportunities have been identified to introduce more sustainable farming methods to reduce storm water runoff on this policy unit.

The majority of site submissions are located in this area, covering 4.9 km², which represents 2.6% of the policy unit area.

6.2.3 River Stour CFMP - Upper and Middle Stour

Upper and Middle Stour is a Policy 6 area within the River Stour CFMP. In areas defined as Policy 6, action should be taken to increase the frequency of flooding to deliver benefits locally or elsewhere (which may constitute an overall flood risk reduction, e.g. for habitat inundation).

Upper Stour

This policy unit covers the tributaries of the Upper Stour. It covers the East Stour to Swanton Mill; Great Stour to Swanton Mill; Great Stour to Godington; Whitewater Dyke to Willowbed Farm and Ruckinge Dyke to Cheeseman's Green. The Upper Stour does not contain any flood

[20] Policy 3 – Continue with existing or alternative actions to manage flood risk at the current level.

[21] Policy 1 – No active intervention (including flood warning and maintenance). Continue to monitor and advise

[22] Policy 6 – Take action to increase the frequency of flooding to deliver benefits locally or elsewhere (which may constitute an overall flood risk reduction, e.g. for habitat inundation).

[23] Policy 4 – Take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).

defences but includes the flood storage reservoirs at Aldington and Hothfield which provide flood defence benefits to Ashford and to locations downstream on the River Stour.

The River Stour CFMP has identified that there may be opportunities to increase storage and attenuation to bring benefits to areas downstream and to Ashford. This could be achieved by increasing the storage afforded by the Hothfield and/or Aldington reservoirs or by creating new areas of storage within the Upper Stour catchment.

Middle Stour

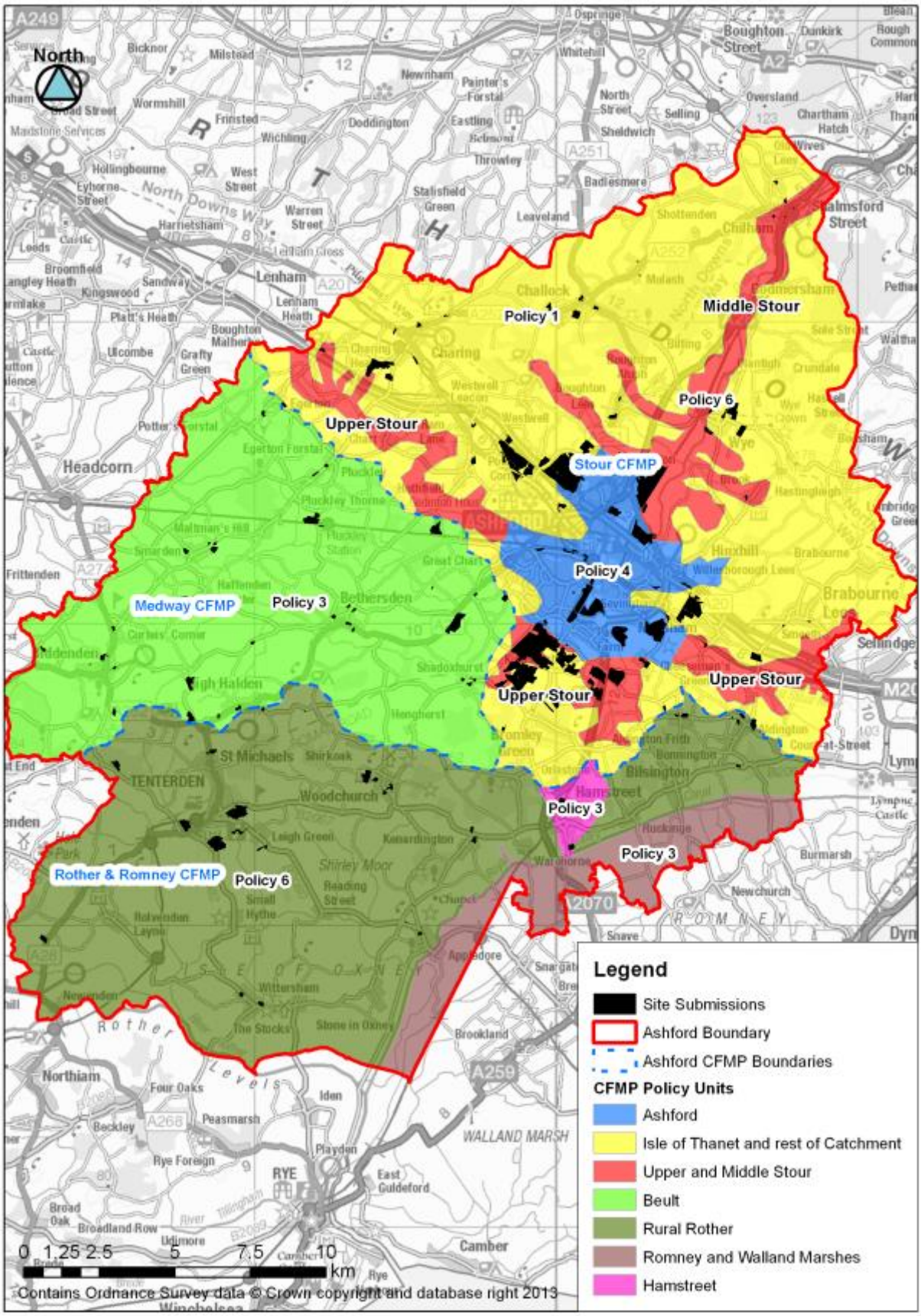
The Upper and Middle Stour policy unit covers the Stour between the M20 and Shalmsford Street. Wye is the only village at risk of flooding. The CFMP also identifies that the A28 and the railway line are at risk. Again there may be opportunities to increase the flood storage within the policy unit which will benefit areas downstream.

There are 23 site submission located in the Upper and Middle Stour policy unit, covering 2.3km², which accounts for 5.1% of the policy unit area.

6.3 River Stour CFMP - Ashford

The Ashford policy unit covers the urban area of Ashford, including the downstream areas of the East Stour, Ruckinge Dyke, Whitewater Dyke and Aylesford Stream, as well as the confluence of these tributaries with the Great Stour.

Figure 6-1: Site Submissions and CFMPs



7 Review of Development Sites

7.1 Introduction

This chapter provides the results of a review of each individual site. Due to the number of sites and the volume of this analysis, the site forms have been appended to this report as Appendix C. Section 7.2 provides a summary of the information presented. This should be used as a key for interpreting the results of the individual site sheets

7.2 Summary Tables and Maps

Table 7-1: Summary Sheet Template

<table>
<tr><th colspan="5">Site Name and Site ID</th></tr>
<tr><td>Area of site (ha):
The area of the site in hectares.</td><td colspan="2">Site Address:
The location and address of the site.</td><td colspan="2">Site Use:
The proposed use and type of development for the site.</td></tr>
<tr><td>Flood Risk Vulnerability</td><td colspan="4">Information regarding the vulnerability classification of the site submission based on the NPPF Technical Guide - Table 2: Flood risk vulnerability.</td></tr>
<tr><th colspan="5">Summary of flood risk to</th></tr>
<tr><td>Within 8m of a Main River</td><td colspan="4">Information regarding the location of the site in relation to Main Rivers.</td></tr>
<tr><td>Within 8m of a Watercourse</td><td colspan="4">Information regarding the location of the site in relation to Watercourses.</td></tr>
<tr><td>Historic Flooding</td><td colspan="4">Information detailing any historic flooding within the site area.</td></tr>
<tr><td>Flood Zone</td><td>FZ1:
Percentage coverage of the site within the Flood Zone 1 outline.

Definition:
This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).</td><td>FZ2 :
Percentage coverage of the site within the Flood Zone 2 outline.

Definition:
This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.</td><td>FZ3a:
Percentage coverage of the site within the Flood Zone 3a outline.
Zone 3a - high probability.

Definition:
This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.</td><td>FZ3b :
Percentage coverage of the site within the Flood Zone 3b outline.
Zone 3b - the functional floodplain.

Definition:
This zone comprises land where water has to flow or be stored in times of flood.</td></tr>
<tr><td>Flood Warning</td><td colspan="4">Confirmation if the site is within an Environment Agency flood warning area.</td></tr>
<tr><td>Flood Defences</td><td colspan="4">A description of any defences recorded by the Environment Agency affecting the standard of protection of the site.</td></tr>
<tr><td colspan="5">Surface Water flood risk:
A description of the pluvial flood risk to the site based on the updated Flood Map for Surface Water (uFMfSW).</td></tr>
<tr><td colspan="5">Groundwater flood risk:
The Areas Susceptible to Groundwater Flooding (AStGWF) data is based upon the top two susceptibility bands of the British Geological Society (BGS) 1:50,000 Groundwater Flood Susceptibility Map. It therefore covers consolidated aquifers (chalk, sandstone etc., termed 'clearwater' in the data attributes) and superficial deposits (unconsolidated surface deposits on top of</td></tr>
</table>

bedrock geology may include stream channel and floodplain deposits, gravels, and glacial drift). It does not take account of the chance of flooding from groundwater rebound. It shows the proportion of each 1km grid square where geological and hydrogeological conditions show that groundwater might emerge.
The susceptible areas are represented by one of four area categories based on the proportion of each 1 km square that is susceptible to groundwater flood emergence. The five categories are:
•N/A (no part of that square is identified as being susceptible to groundwater emergence)
•< 25%;
•>= 25% <50%;
•>= 50% <75%; and
•>= 75%.
It does not show the likelihood of groundwater flooding occurring.
The data should not be interpreted as identifying areas where groundwater is actually likely to flow or pond, thus causing flooding, but may rather to identifying where further studies may be useful. Unless an area identified as 'susceptible to groundwater flooding' is also identified as 'at risk from surface water flooding', it is unlikely that this location would actually experience groundwater flooding to any appreciable depth above ground level, and therefore it is also unlikely that the consequences of such flooding would be significant. Note that this is not necessarily the case for basement or subterranean development.

Reservoir flood risk:
Whether the site is located within the National Reservoir Inundation Mapped outline and which reservoir it is described as being at risk from.

Sewer flood risk:
Information on whether there have been any incidents of sewer flooding within the site boundary based on the Southern Water sewer flooding register.

Effects of climate change:
Information on whether the site is within the fluvial 1 in 100-year plus climate change modelled outline.

- Suitability of SuDS

Bedrock Geology		Information on the underlying bedrock geology in the site area.
Superficial Deposits		Information on the overlying superficial deposits in the site area.
SuDS Type	**Potential Suitability**	**Comments**
Source Control Infiltration Detention Filtration Conveyance	Traffic light system: Yes May be suitable Not suitable	Looking at the geology, soil and slope of the land, this section provides a high level indication as to whether certain SuDS are suitable for a particular site allocation.

- Implications for development

A summary of what needs to be considered in relation to all sources of flood risk within the site allocation. These may include the following:

• Sites greater than 1ha in Flood Zone 1 require a full FRA.
• Any site that falls within Flood Zone 2 or 3 will require an FRA in order to demonstrate how a potential development will mitigate against flood risk from all sources.
• A Flood Defence Consent is required from the Environment Agency for any development proposals within 8m of a designated Main River/Flood Defence.
• Any site affected by the uFMfSW, or with a history of surface water flooding, should undertake an FRA including a comprehensive investigation into surface water flood risk. 'More vulnerable' development should be located in the areas of least flood risk through sequential design of the site. Mitigation of any surface water risk should be detailed in a drainage strategy.
• ABC should consider requesting an FRA where a site is close to an ordinary watercourse that is not included in the Flood Zones.
• A drainage strategy should be submitted at an early stage to show how the impact of the development will be reduced through site design and SUDS techniques.
• Liaison with the appropriate SUDS Approving Body and ABC should be carried out in the early stages of the development.
• The strategy should demonstrate that surface water run off from the site shall be no greater than the rates prior to the development. Assessment for runoff should include allowance for climate change effects.
• Developers should consider the surface water catchment when looking at solutions for mitigation measures for surface water runoff from potential development. This may require developers to consider solutions outside of their site.
• For major developments, or where sewer flooding is a problem, the relevant water company should be consulted at an early stage to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

8 FRA requirements

8.1 Introduction

Planners and developers should refer to the National Planning Practice Guidance[24] and follow the Environment Agency Flood Risk Standing Advice[25] as a starting point when considering applications for new development. In addition, developers should engage with the Local Authority in the early stage of planning, as ABC has specific guidance with regards to any site >5 hectares concerning the assessment of risk from surface water.

This section will summarise guidance that can be used by ABC when preparing an appropriate planning response for development in Flood Zones 1, 2, 3a and 3b (from large strategic sites to small windfall sites) and provide guidance for developers in what should be included within an appropriate Flood Risk Assessment. It should be read with reference to Maps 1 and 2 which show the available flood mapping information for different sources of flood risk.

Table 3 of the National Planning Practice Guidance highlights the type of development considered appropriate for each Flood Zone, where development is not permitted, and where development is allowed only when the Exception Test is passed. Further detail is provided in the National Planning Practice Guidance.

Consideration should be given to the implications of how the Zones might change in future in response to climate change effects. This would be particularly relevant to proposed development which could be phased over a long time period, or where the development relies on the standard of protection afforded by flood risk management measures (such as flood banks or flood attenuation facilities).

8.2 Identifying areas at risk of flooding

When presented with a site for development, planners and developers should use the evidence and maps presented in this SFRA, along with other evidence to identify any risk of flooding (from all sources). However, they should also check to make sure that the information in the SFRA is the best available and if not use information from the most appropriate source (refer to Section 0). Table 8-1 gives some guidelines on sources of evidence and criteria for identifying a significant level of risk.

Table 8-1: Identifying areas at risk of flooding from all sources

Source of flooding	Sources of evidence	Criteria for identifying risk
Fluvial	Environment Agency Flood Zones Environment Agency Historic Flood Map ABC/KCC records Anecdotal evidence	Within Flood Zone 2 or 3.
Minor watercourses (not included in Flood Zone maps)	Detailed River Network ABC/KCC records Anecdotal evidence	Within 8m of the watercourse Local evidence of historic flooding from the watercourse.
Surface water	Environment Agency Flood Map for Surface Water ABC/KCC records Anecdotal evidence	Predicted surface water depths greater than 0.3m at the site on the Flood Map for Surface Water 200 year. Local evidence of surface water flooding in the area.
Groundwater	Environment Agency Areas Susceptible to Groundwater Flooding ABC/KCC records Anecdotal evidence	Risk in highest category on AStGWF. Local evidence of groundwater flooding problems in the area.
Sewer	Thames Water Sewer Flooding Register Map ABC/KCC records Anecdotal evidence	Local evidence of sewer flooding to existing properties on or near the site. Sewer flooding records provided by Thames Water are not detailed enough to identify site-specific risks. However, Thames Water will comment on larger planning applications, and on Local Plans.
Flooding from	Environment Agency reservoir	Within flood envelope on Environment Agency

[24] http://planningguidance.planningportal.gov.uk/

[25] **Environment Agency Flood Risk Standing Advice**

reservoirs, canals and other artificial sources	flood plans - can be viewed on the Environment Agency website under Risk of Flooding from Reservoirs	reservoir flooding maps. Within 8m of a canal or other waterbody.

8.3 Flood Zone 1

All development (essential infrastructure, highly vulnerable, more vulnerable, less vulnerable and water-compatible development) is allowed in Flood Zone 1. All development proposals should consider the following about the sites:

- Their vulnerability to flooding from other sources as well as from fluvial flooding.
- Their potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water runoff.
- Their potential impact on other sources of flood risk such as the groundwater regime (specifically underground development) and the overland flow routes for surface water.
- Their potential impact on watercourses including those not considered in the Flood Zones.
- Developments should be set back from watercourses, seeking a minimum of 8 metres wide undeveloped strip from the top of bank. A Flood Defence Consent is required from the Environment Agency for any development proposals within 8m of a designated Main River/Flood Defence.
- Their access and egress, it should be noted for sites where access and egress routes are located in Flood Zone 2 and/ or 3, the site will be considered to be in that Flood Zone.

8.4 Developments greater than one hectare 1ha in Flood Zone 1

A detailed FRA must be undertaken by a suitably qualified professional. It should:

- Assess risk from all sources of flooding (e.g. fluvial, surface water, sewer, and groundwater) for the lifetime of the development (accounting for climate change). Provide a detailed assessment of the risk using hydraulic modelling, surface water modelling or groundwater investigations as appropriate.
- Recommend mitigation measures in response to any identified flood risk:
- Sequentially design the site to locate the built element of the development away from the source of flood risk.
- Substitute less vulnerable development types for those incompatible with the degree of flood risk. Appropriate space should be allocated within the site for SuDS.
- Assess the impact of proposed development upon surface water drainage following any increase in impermeable area. This should include the potential impact upon areas and receiving watercourses downstream, and recommend the approach to control surface water discharge.
- Demonstrate that a proposed development can reduce flood risk elsewhere through the addition of SuDS, to control the potential impact new development may have on the surface water run-off regime. The following minimum drainage requirements should be adhered to:
    - Reduce surface water runoff, where this is not feasible at a minimum greenfield discharge rates should be met.[26]
    - Attenuation up to the 1% AEP event plus climate change.
    - Consideration of the existing groundwater regime and not raise the water table.

Further information on the details to be provided within the FRA can be found in the Environment Agency's FRA Guidance Note 1[27], CIRIA report C624[28], and National Planning Practice Guide[29].

[26] Note: for some sites it may not be feasible to meet this requirement in highly constrained brownfield sites. In these circumstances, early liaison with ABC and the Environment Agency should be undertaken to consider viable options for onsite drainage.

27 Environment Agency, FRA Guidance Note 1 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/311502/LIT_9193.pdf

8.5 Developments less than one hectare in Flood Zone 1

ABC should be consulted directly for developments <1ha in Flood Zone 1. The Environment Agency is only statutory consultee for sites greater than 1 ha. If a site within Flood Zone 1 has been identified by the SFRA as having a known drainage problem, or has experienced flooding from other sources, then a detailed FRA is required (as above).

For those proposed developments where there is not a known drainage issue then a detailed FRA is not required. Nevertheless, the proposed development should include the appropriate application of sustainable drainage techniques so as to maintain, or preferably reduce the existing runoff and flood risk in the area.

Developers should also be able to demonstrate through an appropriate assessment that a proposed development does not adversely impact on the local groundwater regime.

8.6 Flood Zone 2

Flood Zone 2 is considered suitable for water-compatible, less vulnerable, more vulnerable and essential infrastructure, following application of the Sequential Test. Highly vulnerable development is only allowed where the Exception Test is passed. Depending on the type of development proposed, a Flood Risk Assessment may be required, see Table 3 Flood risk vulnerability and flood zone 'compatibility' within the NPPF Planning Practice Guidance. Planners and developers are to be aware that a FRA should be appropriate to the scale and size of the development and undertaken by a suitably qualified professional. The following should be included within a FRA for developments within Flood Zone 2:

- Assess risk from all sources of flooding (e.g. fluvial, surface water, sewer, and groundwater) for the lifetime of the development (accounting for climate change. Provide a detailed assessment of the risk using hydraulic modelling, surface water modelling or groundwater investigations as appropriate.
- Recommend mitigation measures in response to any identified flood risk, such as:
    - Sequentially design the site to locate the built element of the development away from the source of flood risk.
    - Substitute less vulnerable development types for those incompatible with the degree of flood risk. Appropriate space should be allocated within the site for SuDS.
    - Floor levels should be situated above the 1% AEP (1 in 100 year) plus climate change predicted maximum fluvial level with a minimum freeboard of 300mm and the 0.5% AEP (1 in 200 year) plus climate change predicted maximum coastal level with a minimum freeboard of 300mm.
    - Demonstration that flood resilience/ resistance and emergency escape measures have been incorporated where appropriate. This includes flood defences, flood resilient and resistant design, effective flood warning and emergency planning are acceptable and can be maintained for the lifetime of the development.
- Assess the impact of proposed development upon surface water drainage following any increase in impermeable area. This should include the potential impact upon areas (including siltation) and receiving watercourses downstream, and recommend the approach to control surface water discharge.
- Demonstrate that a proposed development can reduce flood risk elsewhere through the addition of SuDS, to control the potential impact new development may have on the surface water run-off regime. The following minimum drainage requirements should be adhered to:

28 CIRIA (2004) Development and Flood Risk: Guidance for the Construction Industry. Report C624 http://www.ciria.org/service/AM/ContentManagerNet/Search/SearchRedirect.aspx?Section=Search1&content=product_excerpts&template=/contentmanagernet/contentdisplay.aspx&contentfileid=1417

29 Department of Communities and Local Government (2009) Planning Policy Statement 25: Development and Flood Risk Practice Guide.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7772/pps25guideupdate.pdf

  - Reduce surface water runoff, where this is not feasible at a minimum greenfield **discharge rates** should be met.[30]
  - **Attenuation up to the 1% AEP event plus climate change.**
  - Consideration of the existing groundwater regime and not raise the water table.
  - Consideration for existing wildlife habitats.
- Basements should not be used for habitable purposes in Flood Zone 2. Where basements are permitted for commercial use, access points should be situated 300mm above the 1% AEP (1 in 100 year) plus climate change fluvial flood level and the 0.5% AEP (1 in 200 year) plus climate change coastal flood level.
- Demonstration that residual risks of flooding (after existing and proposed flood management and mitigation measures) are taken into account. People (including those with restricted mobility) should be able to remain safe inside a new development in the 0.1% AEP (1 in 1000 year) event; and rescue and evacuation of people from a development is practicable up to a 0.1% AEP (1 in 1000 year) event.
- The proposed development should be set back from the watercourse with a minimum strip of 8m of undeveloped buffer zone to allow for maintenance. A Flood Defence Consent is required from the Environment Agency for any development proposals within 8m of a designated Main River/Flood Defence.

Any proposed development will be required to provide evidence that the Sequential Test, and if required the Exception Test, have been passed. A preliminary FRA, using data from the SFRA, PFRA and any necessary further modelling work (where detailed modelling has not already been provided as part of the SFRA), will be required to ascertain the level of flood risk for Sequential Test purposes. It is strongly recommended that the Sequential Test, and, if necessary, the Exception Test be satisfied before the FRA detailing design and mitigation measures is commenced.

Further information on the details to be provided within the FRA can be found in the Environment Agency's FRA Guidance Note 3[27], CIRIA report C624[28], and the National Planning Practice Guide.

8.7 Flood Zone 3a

Water-compatible uses and less vulnerable development are allowed in this Flood Zone, following application of the Sequential Test. Highly vulnerable development is not permitted, and essential infrastructure and more vulnerable development need to pass the Exception Test. Essential infrastructure should be designed and constructed to remain operational and safe for users in times of flood.

Where, due to wider sustainable development reasons, there are no other suitable sites available in lower risk zones then an assessment of the residual risk within Flood Zone 3 is required. For developments to proceed; it must also be shown that the development is safe and will not increase flood risk elsewhere through a loss of storage or conveyance. Flood risk must be reduced or kept at current levels.

A detailed FRA must be undertaken by a suitably qualified professional. It is required to provide evidence that the Sequential Test, and if required the Exception Test, have been passed. A preliminary FRA, using data from the SFRA, PFRA and any necessary further modelling work (where detailed modelling has not already been provided as part of the SFRA), will be required to ascertain the level of flood risk for Sequential Test purposes.

It is strongly recommended that the Sequential Test, and, if necessary, the Exception Test be satisfied before the FRA detailing design and mitigation measures is commenced. The Sequential Test will already have been applied to adopted site allocations. In the case of windfall sites, developers should speak to the local planning authority to confirm whether developer or planning authority will undertake the sequential test. However, there will be a presumption against development within Flood Zone 3a and 3b.

The following should be included within a FRA for developments within Flood Zone 3a:

[30] Note: for some sites it may not be feasible to meet this requirement in highly constrained brownfield sites. In these circumstances, early liaison with CDC and the Environment Agency should be undertaken to consider viable options for onsite drainage.

- Assess risk from all sources of flooding (e.g. fluvial, surface water, sewer, and groundwater) for the lifetime of the development (accounting for climate change. Provide a detailed assessment of the risk using hydraulic modelling, surface water modelling or groundwater investigations as appropriate.
- Proposed developments located in proximity to formal defences, water retaining structures (reservoirs or canals) will require a detailed breach and overtopping analysis to ensure that the residual risk can be managed for the lifetime of the development. The nature of the breach analysis should be discussed with the Environment Agency and ABC as required.
- Recommend mitigation measures in response to any identified flood risk, such as:
    - Floor levels should be situated above the 1% AEP (1 in 100 year) plus climate change predicted maximum fluvial level with a minimum freeboard of 300mm and above the 0.5% AEP (1 in 200 year) plus climate change predicted maximum coastal level with a minimum freeboard of 300mm.
- Any new "More Vulnerable" or "Highly Vulnerable" development, particularly involving the creation of new residential units, will require safe access and egress up to the 1% AEP (1 in 100 year) flood event, with an allowance for climate change over the lifetime of the development. The assessment should include:
    - Demonstration that flood resilience/ resistance and emergency escape measures have been incorporated where appropriate. This includes flood evidence that defences, flood resilient and resistant design, effective flood warning and emergency planning measures are acceptable and can be maintained for the lifetime of the development.
    - Sequential design of the site to locate the most vulnerable elements of the development away from the source of flood risk.
    - Substitute less vulnerable development types for those incompatible with the degree of flood risk. Appropriate space should be allocated within the site for SuDS.
- Ensure that flood risk is reduced overall, for example that:
    - Flood flow routes are preserved
    - Floodplain storage capacity is not reduced, and where necessary is compensated for on a level for level basis outside of the floodplain.
    - The proposals do not affect the integrity of any existing flood defences and preferably contribute to an increase in the standard of protection.
- Assess the impact of proposed development upon surface water drainage following any increase in impermeable area. This should include the potential impact upon areas and receiving watercourses downstream, and recommend the approach to control surface water discharge.
- Demonstrate that a proposed development can reduce flood risk elsewhere through the addition of SuDS, to control the potential impact new development may have on the surface water run-off regime see Section 8.14. The following minimum drainage requirements should be adhered to:
    - Reduce surface water runoff, where this is not feasible at a minimum greenfield discharge rates should be met.[31]
    - Attenuation up to the 1% AEP event plus climate change.
    - Consideration of the existing groundwater regime and not raise the water table.
- Basements should not be used for habitable purposes in Flood Zone 3. Where basements are permitted for commercial use, access points should be situated 300mm above the 1% AEP (1 in 100 year) plus climate change fluvial flood level and above the 0.5% AEP (1 in 200 year) plus climate change coastal flood level.
- The proposed development should be set back from the watercourse with a minimum strip of 8m of undeveloped buffer zone to allow for maintenance. A Flood Defence

[31] Note: for some sites it may not be feasible to meet this requirement in highly constrained brownfield sites. In these circumstances, early liaison with CDC and the Environment Agency should be undertaken to consider viable options for onsite drainage.

Consent is required from the Environment Agency for any development proposals within 8m of a designated Main River/Flood Defence.

Further information on the details to be provided within the FRA can be found in the Environment Agency's FRA Guidance Note 3[32] and the National Planning Practice Guidance.

8.8 Flood Zone 3b – the Functional Floodplain

The functional flood plain is defined as "land where water has to flow or be stored in times of flood." Only water-compatible uses are allowed in this Flood Zone. Essential infrastructure can be permitted after the Exceptions Test is passed. Essential Infrastructure is defined as essential transport infrastructure (including mass evacuation routes); and strategic utility infrastructure (including electricity generating power stations, grid and primary stations). However, utility infrastructure may not be appropriate if the severity of the potential consequences is remembered for historic flood events at the Mythe Treatment Works, Castlemeads electricity sub-station and the near flooding of the Waltham electricity sub-station are considered. Therefore essential infrastructure built within the functional floodplain should:

- Remain operational and safe for users in times of flood;
- Result in no net loss of floodplain storage;
- Not impede water flows; and
- Not increase flood risk elsewhere.
- Not impact upon the groundwater regime

Flood Zone 3b should be considered as the 5% and 4% AEP (1 in 20 and 25 year) flood extents where these have been modelled and mapped. Where the 5% AEP (1 in 20 year) extents have not been mapped, a precautionary approach should be followed and Flood Zone 3 should be considered as equivalent to the functional floodplain (see Map 1).

ABC should be seeking risk reduction on any sites within Flood Zone 3b. When such land comes up for redevelopment, planning applications should strive for:

- Removal of buildings and restoration of the functional floodplain, including linkage between the watercourse and floodplain.
- Changing the land use to a less vulnerable classification.
- Changing the layout and form of the development (e.g. reducing the building footprint).
- Preserving flow routes.
- Improving conveyance/storage, e.g. replacing solid building with floodable structures.
- Sequential approach to design of site (see Section 8.10)

8.9 Dry islands

Some areas fall within one Flood Zone but are surrounded by areas at a higher risk of flooding i.e. areas within Flood Zone 1 being surrounded by areas Flood Zones 2 and/or 3. In certain cases development within such `dry islands' can present particular hazards to public safety such as people being surrounded by water and needing to be rescued.

Queries regarding the necessity of undertaking a Flood Risk Assessment for sites within 'dry islands' should be taken up with the Environment Agency directly.

8.10 Sites within more than one Flood Zone

Flood risk should be considered at an early stage in deciding the layout and design of a site to provide an opportunity to reduce flood risk within the development. In particular large development proposals may include a variety of land uses of varying vulnerability to flooding.

Where a site covers more than one Flood Zone, the sequential approach should be applied within development sites to design the site layout to reduce flood risk as much as possible.

[32] Environment Agency, FRA Guidance Note 3
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/311509/LIT_9186.pdf

A sequential, risk-based approach should be applied to try to locate more vulnerable land use to higher ground, while more flood-compatible development (e.g. recreational space) can be located in more high risk areas subject to appropriate management.

Low-lying waterside areas, or areas along known surface water flow routes, can be used for recreation, amenity and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits contributing to other sustainability objectives.

Landscaping should ensure safe access to higher ground from these areas, and avoid the creation of isolated islands as water levels rise.

8.11 Planning policies for existing settlements within Flood Zones 2 and 3

Below are recommendations for specific policies within Flood Zones 2 and 3 which could be applied following a Sequential Test. There is an opportunity for ABC to incorporate these policies into the Site Allocations and Development Policies and the Local Plan respectively:

Reducing vulnerability: On change of use of sites, opportunities should be taken to reduce vulnerability to flooding, by promoting less vulnerable and water compatible land uses.

Layout and footprint: On redevelopment of a site, opportunities should be taken to reduce the building footprint, thus improving floodplain storage and flow paths. Also, opportunities should be considered for the allocation of SuDS to be included with the revised footprint[33].

Residential Infill: Residential infill (for example construction of a new property in the garden of an existing property) will be required to pass the Sequential Test within established residential areas in Flood Zones 2 and 3.

Extensions: Extensions to existing properties should not be permitted in Flood Zone 3a, unless their design is flood resilient.

Residential development above shops: Residential developments above shops in Flood Zone 3 should demonstrate that 'safe' access and egress will be maintained. Where this is not feasible, safe access should be ensured.

8.12 Emergency Services

Civil emergency infrastructure (such as hospitals, fire stations, police stations and emergency vehicle depots) needs to be operational, including access, in all circumstances. Location in even low-risk areas subject to extreme events could lead to lack of availability should such an event occur. Even if buildings are not within the flood plain, escape routes and emergency services access should be confirmed, see Section 9 for further details.

8.13 Climate Change and Adaptation and Mitigation

An important part of the SFRA analysis process is the consideration of future climate change and the increased impact that development may have as a result of that climate change. When reviewing development plans it is important to understand not only the current predicted flood risk to a site but also the flood risk for the life time of the development. For residential development the analysis is undertaken based on a development lifetime of 100 years. A number of adaptation and mitigation measure are considered within this document and should be a feature of planning applications and FRAs in support of development within Ashford on a site by site basis. The following section serves as an introduction to the assessment behind these measures and the reasoning for their importance to development. The focus has been on new development however the key features of this discussion apply equally to retro-fit of adaptation and mitigation measures to existing development.

8.13.1 Adaptation

The UK Climate Change Impacts Programme (UKCCIP) report Identification of Adaptation Options[34] presents a framework for identifying and appraising adaptation measures. It starts

[33] http://www.kent.gov.uk/waste-planning-and-land/flooding-and-drainage/sustainable-drainage-systems

[34] Identifying adaptation options -UK Climate Change Impacts Programme http://www.ukcip.org.uk/wordpress/wp-

with identifying that there may be several viable options for effective adaptation. These options are then reviewed to assess the risks of implementation in the face of associated uncertainties. As a result of this review schemes that are the most cost effective and present multiple benefits come out of the analysis above those that are cost intensive and are reliant on a substantial increase on the current level of risk to provide significant benefit.

Following review adaptation options are grouped into four categories: No-Regrets, Low Regrets, Win-Win and Flexible/Adaptive Management. The four categories are discussed as follows:

No-regrets options

No-regrets options are adaptive measures that deliver benefit whatever the extent of future climate change. No-regrets options include those justified (cost-effective) under current climate conditions and the benefits of the scheme are only further justified when consideration of projected climate change levels is taken into account. Focusing on no regrets options is particularly appropriate for the near term as they are more likely to be implemented due to their obvious and immediate benefits.

No-regrets adaptation options include actions or activities directed at building adaptive capacity as part of an overall adaptive strategy. Those relevant to the SFRA include the following examples:

- Avoiding building in high-risk areas (e.g. flood plains) when locating development (Sequential Test)
- Reducing water usage in new development
- Building/designing property and buildings to minimise over-heating in summer months though the use of green space and running water.
- Reducing the consequences of flooding (increasing resilience) through the use of water-resistant materials for floors, walls and fixtures, and the sitting of electrical controls, cables and appliances at a higher than normal level.

Such options will require investments but overall are at least cost neutral when the immediacy of the targeted risks and realised benefits are considered.

Low-regrets options

Low regrets options are adaptive measures for which the associated costs are relatively low and for which the primary benefits realised only under the projected future climate change scenario. Benefits under these scenarios may be relatively large and there may even be some current day benefits from implementing the schemes, but the present day benefits alone would not be enough to pass cost-benefit analysis by its self.

Low-regret adaptation options include actions or activities that directly target the consequences of climate change but have a low relative cost. Those relevant to the SFRA include:

- Building extra climate headroom in new developments to allow for further modifications (e.g. increased drainage and increased finished floor level)
- Restricting the type and extent of development in flood-prone areas
- Promoting the creation and preservation of space (e.g. verges, agricultural land, and green urban areas, including roofs) in support of additional temporary storage of runoff or flood water.
- Sharing in developing and operating additional water storage facilities (e.g. water groups building and operating a joint water reservoir).
- Improving the flood resilience of critical infrastructure, when it is renewed. (such as electricity sub stations).

Both no- and low-regrets options have merit in that they are directed at maximising the return on investment when certainty of the associated risk is low.

Win-Win options

content/PDFs/ID_Adapt_options.pdf

Win-win adaptation options are measures that have the desired result in terms of minimising the climate risks or exploiting potential opportunities but also have other social, environmental or economic benefits. Within the climate change context, win-win options are often associated with those measures or activities that address climate impacts but which also contribute to mitigation or other social and environmental objectives. These types of measures include those that are introduced primarily for reasons other than addressing climate risks, but also deliver the desired adaptation benefits.

- Flood management that includes creating or re-establishing flood plains which increase flood management capacity and support biodiversity and habitat conservation objectives;
- Improving preparedness and contingency planning to deal with risks (including climate);
- Green roofs and green walls which have multiple benefits in terms of reducing building temperature and rainfall runoff from buildings, and increased green spaces within urban areas, but also reduces energy use for both heating and cooling.
- Flood mitigation measures that also contribute to improved water quality within the catchment (SUDs measures that improve the quality of discharges watercourses)

Flexible or adaptive management options

Flexible or adaptive management adaptation options involve putting in place incremental adaptation options, rather than undertaking large-scale adaptation in one fell swoop. This approach reduces the risks associate with being wrong, since it allows for incremental adaptation. Measures are introduced through an assessment of what makes sense today, but are designed to allow for incremental change, including changing tack, as knowledge, experience and technology evolve.

"Delaying" introducing a specific adaptation measure (or suite of measures) can be part of a flexible or adaptation management strategy as long as that decision is accompanied by a commitment to continue building the necessary adaptive capacity while continuing to monitor and evaluate the evolving risks. A decision to delay introducing a specific action is often taken when the climate risks are below defined thresholds or when the required adaptive capacity is insufficient to warrant immediate effective action.

Examples of flexible or adaptive management adaptation options that are relevant to the SFRA include:

- Delay implementing specific adaptation measures while improving understanding of risk
- Introducing progressive withdrawal from areas at risk of flooding and creation or re-establishment of floodplains consistent with risks and development lifetimes
- Progressive development and investments in adaptation measures consistent with projected changes in climate (e.g. progressive investments in defence maintenance and level raising to maintain status quo).

Flexible or adaptive management options are perhaps the most important to plan and should be a key feature of any local flood risk management plan. They are primarily schemes that are not economically viable under the present circumstances base on the final measures whole file costing however as the local situation changes with time (e.g. change in land use and development rates) then the schemes become increasingly important. By identifying these type of measures early on it is possible to effectively plan and invest in a flexible plan of action and avoid repetition of work each time the scheme or measure is reviewed. This can be as simple as over engineering the foundations of a flood defence so that additional courses of bricks can be added over time to raise the level of the defence. Rather than having to demolish the defence and start anew each time its level is altered. It also allows for careful financial management of the funding of such measures to spread the resulting whole life cost across a number of different funding streams as they present themselves and become available without committing to the full measure today without all the funding in place.

8.13.2 Mitigation measures

The scale of redevelopment being proposed in the next 5, 10 and 15 years presets an important opportunity to 'design-in' capacity for climate change mitigation into new development. The key opportunity for development or re-development of this scale is to build in additional capacity into systems to counter the predicted effects of climate change. This form of adaptation linked to new development is particularly important in densely developed urban areas, where over

subsequent planning cycles and periods of redevelopment it is possible to gradually introduce measures that contribute to a reduction in the overall effects of climate change.

By requiring sites to mitigate today for the effects of 100 years of climate change it has the additional benefit of introducing local capacity in the present day systems. The mitigation schemes that include provision for the level of service as will be required in 100 year will currently provide an augmented level of service under present day conditions.

8.14 Surface water runoff and drainage

A FRA should consider how surface water will be managed on the development site. A preliminary drainage strategy should be fully outlined in the FRA, even at a speculative stage. Any locations where surface water or sewer flooding are an issue should consider the impact of climate change on rainfall intensity as outlined in the NPPF Technical Guidance.

Site drainage should be to SuDS infiltration systems where practicable[35]. Where it is not practicable to drain the entire site to infiltration systems, appropriate assessments should be carried out for green and brownfield developments.

Redevelopment of brownfield sites offers the opportunity to remove connectivity to foul or combined sewerage systems, with consequent benefits for reducing sewer flooding and the potential of pollution from combined sewer overflows (CSOs).

Opportunities for developing an Integrated Water Management Strategy across development site boundaries should be explored, and a catchment led approach should be adopted. An integrated approach to controlling surface water drainage can lead to a more efficient and reliable surface water management system as it enables a wider variety of potential flood mitigation options to be used. In addition to controlling flood risk, integrated management of surface water has potential benefits, including improved water quality and a reduction of water demand through rain-water recycling and reuse.

Integrated drainage systems may be considered suitable for catchments where other development is being planned or constructed, and where on-site measures are set in isolation of the systems and processes downstream.

8.14.1 Runoff rates

ABC's adopted Sustainable Drainage SPD[36] sets out the Council's requirements for developments to manage their post development runoff rates. The design philosophy for greenfield sites requires that site drainage be limited to the greenfield runoff rate, up to the 1% AEP (1 in 100 year) design event. However this is expanded upon more within the SPD. Guidance on calculating greenfield runoff rates is given in the Defra/EA guide to preliminary rainfall runoff management for developments[37].

The Environment Agency will expect, where practicable, that the developer should design drainage of a brownfield site such that there is a reduction in flows from the previous usage. For some sites it may not be feasible to meet these requirements in highly constrained brownfield sites. In these circumstances, early liaison with ABC and the Environment Agency should be undertaken to consider viable options for onsite drainage.

8.14.2 Sustainable Drainage Systems (SuDS)

Sustainable Drainage Systems (SuDS) are management practices which enable surface water to be drained in a more sustainable manner and to endeavour to mimic the local natural drainage.

There are many different SuDS techniques which can be implemented. The effectiveness of a flow management scheme within a single site is heavily limited by site constraints including (but not limited to) topography, geology (soil permeability), and available area. The design, construction and ongoing maintenance regime of such a scheme must be carefully defined, and a clear and comprehensive understanding of the catchment hydrological processes (i.e. nature

35 South East England LLFAs (2013) Water. People. Places http://www.kent.gov.uk/waste-planning-and-land/flooding-and-drainage/sustainable-drainage-systems

36Ashford Borough Council, Adopted Sustainable Drainage SPD http://www.ashford.gov.uk/sustainable-drainage-spd

37 Defra/ Environment Agency (2005) Preliminary rainfall runoff management for developments. R&D Technical Report W5-074/A/TR/1. http://archive.defra.gov.uk/environment/flooding/documents/research/sc030219.pdf

and capacity of the existing drainage system) is essential. Additionally, for infiltration SuDS it is imperative that the water table is low enough and a site specific infiltration test is undertaken. Where sites lie within or close to source protection zones further restrictions may be applicable, and guidance should be sought from the Environment Agency.

FRAs should consider the long-term maintenance and ownership of SuDS.

Kent County Council will become a SuDS Approval Body (SAB) by the commencement of Schedule 3 of the Flood and Water Management Act 2010, which will be at some time in the future (yet to be determined). This means that all new development which has surface water drainage implications will potentially require SAB approval and need to conform to National and Local Standards. KCC, along with a number of other LLFAs in South East England have produced a document "Water. People. Places - A guide for master planning sustainable drainage into developments"[38]. The guide outlines the process for integrating sustainable drainage systems (SuDS) into the master planning of large and small developments. It promotes the consideration of the movement of water and its interaction with space at the earliest stage of design, which is crucial to the success of SuDS and allows the developer to maximise wider benefits. KCC expect the guide to be used as part of the initial planning and design process for all types of residential, commercial, and industrial development within ABC.

Further guidance on SuDS can be found at the documents and websites as follows:

- Susdrain website[39] - online community for delivering sustainable drainage
- CIRIA documents - there are several CIRIA guides relating to SuDS, most notably The SuDS Manual[40], although this is currently undergoing an update. The Susdrain website is a good guide to the available documentation.
- Environment Agency SuDS guidance[41] - Environment Agency advice for developers
- Interim Code of Practice for Sustainable Drainage Systems[42]

Connection of surface water drainage to an existing surface water sewer should only be considered as a last resort. The sewerage undertaker should be consulted at an early stage to ensure that sufficient capacity is available in the existing drainage system.

8.15 Wastewater

Major developments must carry out wastewater capacity checks and should liaise with the sewerage undertaker at an early stage to prevent an increase in sewer flooding and/or spills from combined sewer overflows (CSOs) further down the wastewater system as a result of the development.

The impact of an increased volume of foul water discharge on watercourses should also be considered for large sites, or where several sites are likely to be developed in the same Sewage Treatment Works (STW) catchment, particularly where the receiving STW discharges into the same watercourse as the surface water runoff from the site.

8.16 Making development safe

8.16.1 Basements

Basement dwellings are classified as 'Highly Vulnerable' according to the National Planning Policy Framework - Technical Guide (Table 2)[43]. As such basement dwellings should not be permitted within Flood Zone 3a and must pass the Exception Test should they be proposed within Flood Zone 2. Basements dwellings should be discouraged within areas at risk of fluvial, surface water or groundwater flooding.

38 South East England LLFAs (2013) Water. People. Places http://www.kent.gov.uk/waste-planning-and-land/flooding-and-drainage/sustainable-drainage-systems

39 Susdrain website http://www.susdrain.org/

40 CIRIA (2007) The SuDS Manual (C697)

41 Environment Agency SuDS guidance http://www.rtpi.org.uk/media/12399/suds_a5_booklet_final_080408.pdf

42 National SuDS Working Group (2004) Interim Code of Practice for Sustainable Drainage Systems. http://www.environment-agency.gov.uk/static/documents/Business/icop_final_0704_872183.pdf

43 Department for Communities and Local Government (March 2012) Technical Guidance to the National Planning Policy Framework available at http://www.communities.gov.uk/documents/planningandbuilding/pdf/2115548.pdf

Where basements are permitted however, basement access points should be situated at minimum of 300 mm above the 1% AEP (1 in 100 year) plus climate change fluvial flood level and at a minimum of 300mm above the 0.5% AEP (1 in 200 year) plus climate change coastal flood level. The basement must have unimpeded access and waterproof construction to avoid seepage during flooding conditions. In addition, it is important with proposals for subterranean development that there is no adverse impact on the groundwater regime. Therefore where basement developments are proposed, an assessment of existing and potential groundwater levels at the site should be undertaken, including monitoring of groundwater levels from the conception to the completion of a proposed development. Groundwater levels should also be monitored for a year post development.

8.16.2 Flood resistance and resilience

Resistance and resilience measures are measures which reduce the impact of flooding or increase the ability of people or buildings affected to recover from flooding. These measures are particularly relevant where minor developments (such as domestic extensions) are allowed in flood risk areas. Further useful guidance is provided in the National Planning Practice Guidance (CLG, March 2014)[29], which describes the possible measures:

- Flood resistance measures are used to prevent water from entering a building, e.g. flood barriers across doorways and airbricks; non-return valves and raising flood levels.
- Flood resilience measures are used when water is designed to enter the building, but cause minimal damage and can be quickly returned to use after a flood, e.g. raising electrical sockets, tiled floors.

The measures chosen will depend on the nature of the flood risk, and obviously development vulnerable to sewer flooding will require a different approach to one, for example at risk from flooding of the River Stour.

Further guidance is available in the Department of Communities and Local Government's document, Improving the flood performance of new buildings[44].

8.16.3 Safe access and egress

Reference should be made to the NPPF Planning Practice Guidance. For development in Flood Zone 3 it is necessary to provide safe access and egress during a flood.

Within Flood Zone 3, access should remain 'safe' for 'more' and 'highly vulnerable' uses and should preferably for other uses such as 'less vulnerable' land use classifications. 'Safe' escape for residential dwellings should be up to the 1% AEP event (1 in 100 year) taking into account climate change for fluvial flood risk and up to the 0.5% AEP event (1 in 200 year) taking into account climate change for coastal flood risk.

Within Flood Zone 2, people (including those with restricted mobility) should be able to remain safe inside a new development in the 0.1% AEP event (1 in 1000 year); and rescue and evacuation of people from a development is practicable up to a 0.1% AEP event (1 in 1000 year).

The developer will be asked (if this is not already included in the FRA) to review the acceptability of the proposed access using the 'Flood Risk to People' FD2320 calculator. In this instance it needs to be demonstrated that depths and velocities of flood water will be acceptable to the 'risks to some' category of this calculator. The 'risk to some' category includes children, the elderly and the infirm.

8.17 Water quality and biodiversity

All development should assess the impact of site drainage on the Water Framework Directive (WFD) status of the waterbody the water will drain into. The assessment should consider both water quality and quantity as a change to one or both of these may have a detrimental impact on the waterbody which will need to be mitigated for. For example SuDS schemes can alter the discharge runoff rate into watercourses and consideration needs to be given to the impact of this change on the physical structure of the watercourse and its ecology.

[44] Department of Communities and Local Government (2007) Improving the Flood Performance of New Buildings: Flood Resilient Construction http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf

An impact assessment should also be carried out if the floodplain habitat currently depends on periodic inundation, for example water meadows. SuDS schemes can also be used for recreation, amenity and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits contributing to other sustainability objectives.

8.18 River restoration and enhancement

All new development close to rivers and culverts should consider the opportunity presented to improve and enhance the river environment. As a minimum, ABC and developers should aim to set back development 8m from the river, providing a buffer strip to 'make space for water' and allow additional capacity to accommodate climate change. The 8m buffer should not contain any built environment including roads, lighting and fencing.

Developments should look at opportunities for river restoration, de-culverting and river enhancement as part of the development. Restoration can take place on various scales, from small enhancement measures to full river restoration. Options include backwater creation, in-channel and bank habitat enhancement, removal of structures e.g. weirs, removal of toe-boarding, restoration of banks and reinstatement of meanders.

When designed properly, such measures can have benefits such as reducing the costs of maintaining hard engineering structures, reducing flood risk, improving water quality and increasing biodiversity. Social benefits are also gained by increasing green space and access to the river. Advice on river restoration, de-culverting and providing other environmental enhancements on development sites is available from the Environment Agency[45]. Early consultation is recommended.

Any modifications made as part of a proposed opening up and/ or restoration of river channels and corridors should be designed by suitable professionals and a full flood risk assessment of the impact of the modifications will be required to be carried out.

8.19 Existing watercourses, defences and assets

Permanent or temporary works within or adjacent to a watercourse require a Land Drainage Consent from the Environment Agency (in the case of Main rivers) or from KCC who act on behalf of the LLFA for ordinary watercourses. The Internal Drainage Board's consent will be required for works on those watercourses within the drainage district.

Proposed developments which are adjacent to Environment Agency assets must demonstrate a minimum clearance of 8m from these assets to permit maintenance and renewal.

Developers should consult Map 1 to determine the location of defences. The FRA should consider the mechanisms of potential failure, the standard of protection, the worst case scenario breach and the residual risk. Parameters for the breach should be discussed with the Environment Agency prior to the building of a hydraulic model.

Where developers are riparian owners, they should also assess existing assets (e.g. bridges, culverts, river walls, embankments) and renew them to last the lifetime of the development. Enhancement opportunities should be sought when renewing assets, e.g. bioengineered river walls, raising bridge soffits to account for climate change.

There should be a presumption against further culverting and building over culverts. All new developments with culverts running through the site should seek to de-culvert rivers for flood risk management and conservation benefit. Wherever possible, existing watercourses and drainage channels should be retained, offering risk management authorities benefits in terms of maintenance, future upgrading, and biodiversity and pollution prevention. The CIRIA (2010) Culvert Design and Operation Guide provides guidance in this area[46].

Where a culvert is present, the FRA must consider risk from the culvert being both 0% blocked and 75% blocked.

[45] Environment Agency (2006). Building a better environment. A guide for developers http://www.environment-agency.gov.uk/static/documents/1_GETH1106BLNE-e-e(1).pdf

[46] CIRIA (2010) Culvert Design and Operation Guide. CIRIA report C689

8.20 Developer contributions to flood risk improvements

Major development offers a unique opportunity to reduce the level of flood risk, both to the development area, and also to existing communities downstream. Changes to legislation mean that it is now much easier for developers to contribute towards the cost of flood risk improvements.

Without allocated sites, location specific recommendations on developer contributions or strategic options cannot be made at this stage. In the case of ABC, the following schemes have been identified from the Environment Agency's 2014/15 Flood and Coastal Risk Programmes of Work[47]:

- Ashford conveyance improvements (reserved funding for 2014/15)
- Great and Little Stour flood alleviation scheme (reserved funding for 2014/15)
- Aylesford property level protection (indicative funding for 2015/16 onwards)
- Aylesford Stream flood alleviation scheme (indicative funding for 2015/16 onwards)
- Maytham tilting weir (indicative funding for 2015/16 onwards)
- South Ashford flood alleviation scheme (indicative funding for 2015/16 onwards)

As outlined above improvements tend to be small scale works, generally funded at the moment by FCRMGiA. Developers can be asked to make direct contributions to flood alleviation schemes affecting the communities close to developments.

[47] 2014/15 Flood and Coastal Risk Programmes of Work (2014)

9 Emergency Management

9.1 Introduction

Under the current NPPF Planning Practice Guidance all proposed developments should consult with the emergency services when considering safety and preparing an evacuation plan for the development as part of the flood risk assessment.

This section provides outline guidance on what detail should be included in a evacuation plan to be submitted in support of a site specific FRA. Developers are advised to consult with ABC Emergency Planning team and the Environment Agency in the early stages of the planning process together with representatives from the appropriate emergency service responders.

9.2 The purpose of a Flood Emergency Plan

A Flood Emergency Plan records contingency measures that have been drawn up to address the safety of persons during a major flood event including an evacuation plan. The Flood Emergency Plan should be disseminated to the ABC Emergency Planning team to make responding agencies aware of the evacuation measures and to promote measures that enables:

- Residents to be evacuated from a proposed development upon receipt of an Environment Agency flood warning;
- the promotion of safety by raising awareness of the flood risk;
- the definition and clarifications of areas of responsibility for those participating in the Emergency Plan;
- the establishment of procedures for implementing the Emergency Plan;
- the reduction of risk to life.

9.3 The content of an Emergency Plan

An Emergency Plan should be appropriate for the size and scale of the development. It should contain

1. A location plan - detailing the site and its proposed access and egress points
2. Details of the flood risk to the site from all sources.
3. Provide details of the Environment Agency flood warning and alert service the proposed development will be registered to.
4. The Emergency Plan should identify appropriate flood evacuation procedures.
5. Identify a safe evacuation route from the proposed development away from the areas of flood risk. The Emergency Plan should be mindful of the depth and velocity of flood flows and consider flood risk to people. [48]

9.4 Environment Agency Flood Warnings

9.4.1 Flood Warning Service

In England and Wales the Environment Agency operates a Flood Warning service in areas at risk of flooding from rivers or the sea. Using the latest available technology, Environment Agency staff monitor rainfall, river levels and sea conditions 24 hours a day and use this information to forecast the possibility of flooding. If flooding is forecast, warnings are issued using a set of four easily recognisable codes.

Many parts of the country are covered by the Environment Agency's full four stage Flood Warning Service.

[48] **Defra /Environment Agency (2006) Flood and Coastal Defence R&D Programme Flood Risks to People Phase 2 FD2321/TR2 Guidance Document**

Table 9-1: Environment Agency Flood Warning Codes

Flood Warning Code	What it Means	What To Do
	Flooding is possible. Be prepared.	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.
	Flooding is expected. Immediate action required.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.
	Severe flooding. Danger to life.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.
Warnings no longer in force	No further flooding is currently expected in your area.	Be careful. Flood water may still be around for several days. If you've been flooded, ring your insurance company as soon as possible.

9.4.2 Floodline Warnings Direct (FWD)

Table 9-2 describes those areas within Ashford Borough Council that are covered by the Environment Agency's Flood Warning and Alert Service. Floodline Warnings Direct (FWD) is a free service that provides Flood Warnings and Flood Alerts via telephone, SMS, fax and email to those registered with the service.

Developers should also refer to the Environment Agency's website, specifically "What's in your backyard?" where the locations of the Flood Warning and Alert areas are displayed on interactive maps.[49]

Table 9-2: Environment Agency Flood Warning and Alert Areas in Ashford Borough Council

Flood Alert		Flood Warnings	
Target Area Code	**Target Area Name**	**Target Area Code**	**Target Area Name**
073WAC305	The Coast from Sandgate to Dungeness	073FWC8A	Coast from Folkestone to St Mary's Bay
		073FWC8B	Coast from Littlestone Golf Course to Dungeness
073WAF327	The River Beult Area	073FWF8A9	River Beult from Pluckley and Bethersden to Hampstead Lock
073WAF341	The Upper River Stour Area	073FWF6A1	Whitewater and Ruckinge Dykes
		073FWF6A2	Aylesford Stream between Hinxhill and Ashford
		073FWF6A3	Great Stour between Lenham and Ashford
		073FWF6A5	River East Stour
073WAF342	The Lower River Stour Area	073FWF6A4	Great Stour between Ashford and Fordwich
073WAF351	The River Rother Area	Not Registered	
		Not Registered	
F361	The Hamstreet Arm Area	073FWF5B1	Speringbrook Sewer (Hamstreet Arm)
Not registered		073FWF6A3	Great Stour between Lenham

[49] Environment Agency What's in your backyard?

Flood Alert		Flood Warnings	
Target Area Code	**Target Area Name**	**Target Area Code**	**Target Area Name**
			and Ashford
Not registered		073FWF6A5	River East Stour

9.4.3 How to Register

Residents can register to receive flood warnings via FWD by the following means:

Internet

Using the Environment Agency's website https://fwd.environment-agency.gov.uk/app/olr/home

Telephone

By telephone using the Environment Agency's Floodline: **0345 988 1188**

Flood Warning Lead Time

Flood Warning Lead Time is the time between a flood warning being issued and the onset of flooding. The greater the lead time the more time there will be to prepare and evacuate. The Environment Agency's Target Lead Time is 2 hours (Environment Agency's Corporate Strategy Target).

9.5 Preparation of an Emergency Plan

Figure 9-1: describes the process developers should consider when completing an Emergency Plan. In addition, the Environment Agency website provides guidance relating to preparing plans for a business, community or a home.

The following contacts should be included within the plan.

Organisations Involved in a Flood Response

Kent Police - **01622 690690 (24hrs)**

Kent Fire and Rescue Service - **01622 692121 (24hrs)**

Ashford Borough Council (General) - **01233 330389 or 07824 623392 and 01233 330337 (Emergency Centre)**

Environment Agency (General) - **08708 506506**

Environment Agency Floodline - **0345 988 1188**

Environment Agency Incident Hotline (Report flooding / pollution) - **0800 807060**

In an emergency only call 999

Useful Websites

Kent County Council

http://www.kent.gov.uk/environment_and_planning/flood_risk_management.aspx

Ashford Borough Council

http://www.ashford.gov.uk/flooding

Environment Agency:-

What's in your backyard?

http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

Flood preparation guide for your business

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292937/LIT_5284_ab06c2.pdf

Make a personal flood plan

http://apps.environment-agency.gov.uk/flood/151256.aspx

Flood Warnings

http://apps.environment-agency.gov.uk/flood/31618.aspx

National Flood Forum:-

http://www.floodforum.org.uk

Figure 9-1: Emergency Plan Process Diagram

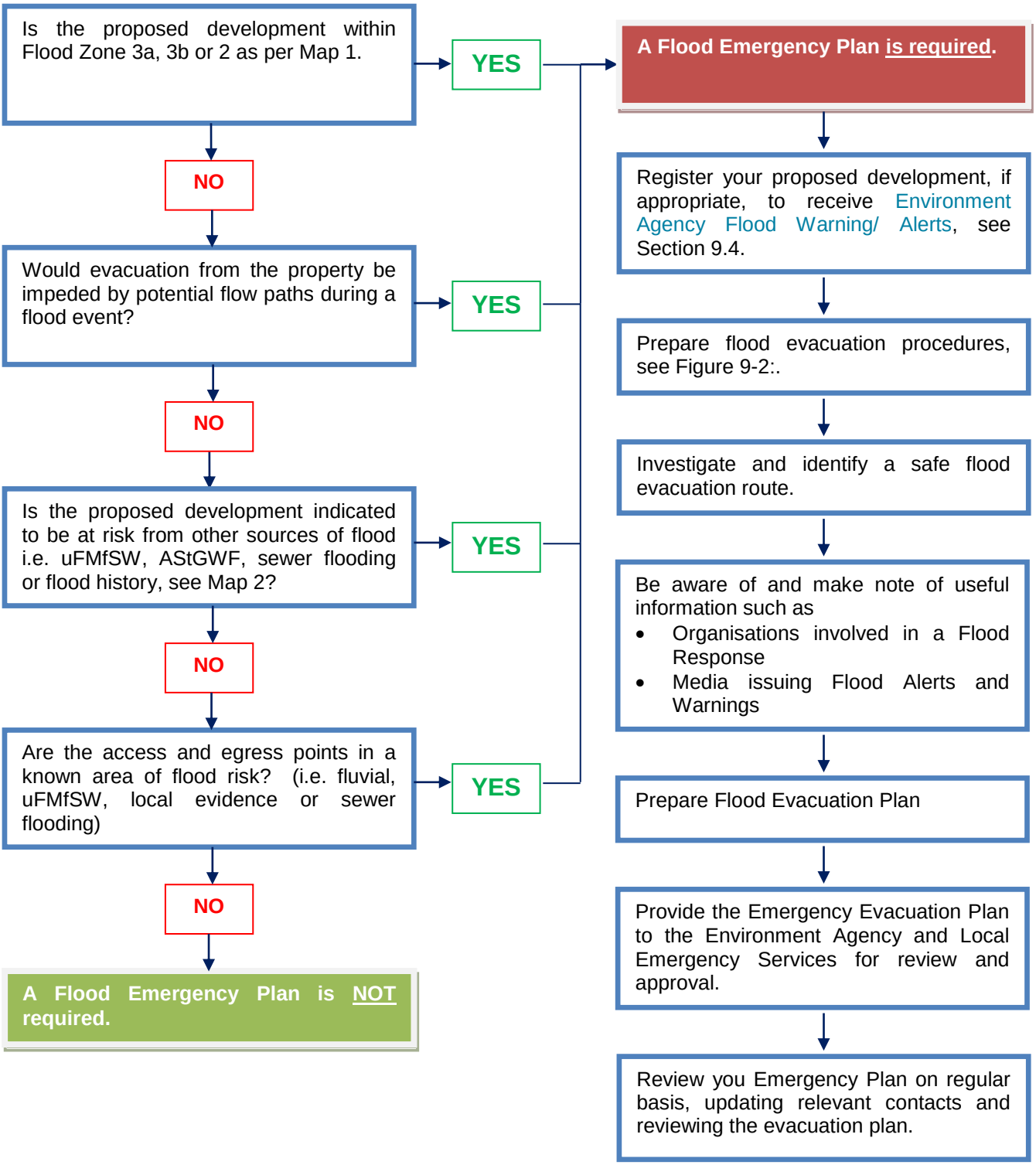
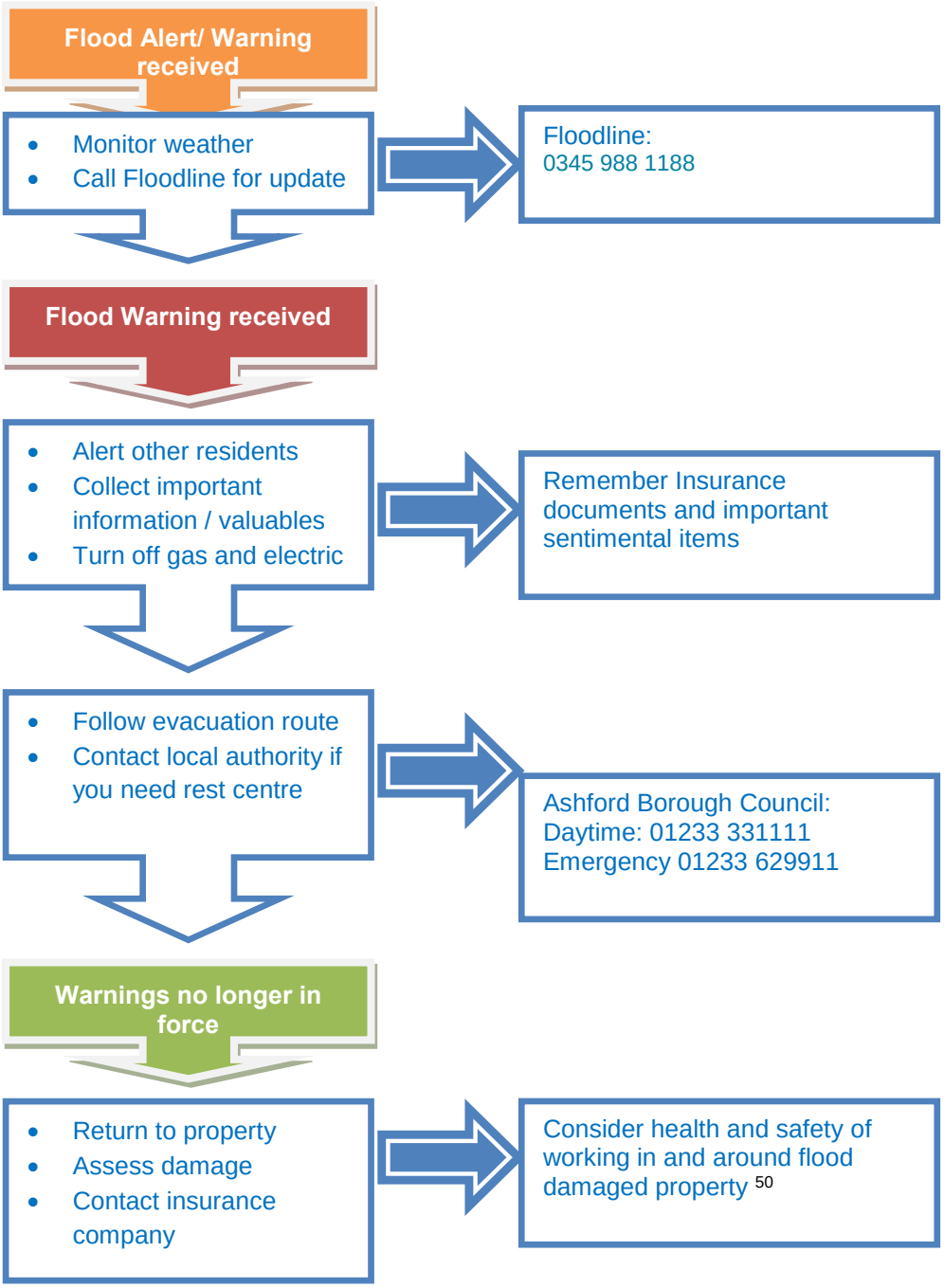


Figure 9-2: Sample Emergency Evacuation Procedures



[50] Health Protection Agency - Health Advice, General Information following floods

10 Outcomes

The scope of this version of the Ashford Borough SFRA has been increased to reflect changes in policy and legislation, to bring the planning context and flood risk information up to date and to aid the development of the Local Plan.

The SFRA provides general advice for planners and developers on:

- Sources of flood risk mapping and other evidence to inform the Sequential Test
- Summarises flood risk from each source of flooding in the Districts
- What is required from a Flood Risk Assessment
- Other issues that need to be considered when carrying out development close to watercourses.

It also provides more specific flood risk information and advice for each of the strategic sites and key settlements under consideration by the Council as potential development areas at the time of writing.

It is important to remember that information on flood risk is being updated continuously. This is particularly true now that the Council have taken responsibility for carrying out and recording flood investigations under the FWMA. The Environment Agency has a rolling programme of flood modelling and mapping studies, and updates to the Flood Map are made quarterly. Where new mapping studies have been carried out, this will also affect the definition of the functional floodplain (Flood Zone 3b) and the climate change outline.

As ABC move forward with their emerging Local Plan which includes site submissions they should use the most up to date information in the Sequential Test and developers should be aware of the latest information for use in Flood Risk Assessments.

The Flood and Water Management Act (2010), the Localism Act (2011) and the National Planning Policy Framework (2012) all offer opportunities for a more integrated approach to flood risk management and development. As they are in the relatively early stages of the site allocation process, ABC have a real opportunities to make sure development provides improvements to flood risk overall and enhancements to the river environment.

Appendices

A 'Watercourses' of Ashford Borough

Table A1: 'Watercourses' of Ashford Borough (Refer to Section 3.2)

Watercourse	Type	Location	Responsible Party
Aylesford Stream	Main River	From Beeches Wood to the east of Ashford through Aylesford and South Willesborough to its confluence with the East Stour.	Environment Agency
Blackmans Arm	Main River	North East of Appledore	Environment Agency
Bournewood	Main River	Flows under Bourne Lane, Hamstreet where it joins the Speringbrook Sewer	Environment Agency
Brattle - Woodchurch	Main River	Flows west underneath Front Road, Woodchurch where it joins the Cradlebridge Sewer	Environment Agency
Brook Stream	Main River	It flows to the north west of Brook where it joins the Great Stour upstream of Browning Bridge	Environment Agency
Cradlebridge Sewer (M2)	Main River	From Woodchurch it flows south through Shirley Moor to the Reading Sewer	Environment Agency
East Stour	Main River	From Barrowhill, parallel to Channel Tunnel Rail Link, through The Forstal, A2070, A2042, crosses under railway station through Ashford Town to its confluence with Great Stour under A292.	Environment Agency
Engine Sewer (M55)	Main River	East of Appledore	Environment Agency
Fifth Government Drain (M7)	Main River	South East of Appledore Heath parallel to the Royal Military Canal (north)	Environment Agency
First Government Drain (M3)	Main River	South East of Bilsington, parallel to the Royal Military Canal (north)	Environment Agency
First Marshland Sewer (M11)	Main River	South of the Royal Military Canal,	Environment Agency
First Speringbrook Sewer (M25)	Main River	South East of Kenardington, north of the Royal Military Canal running parallel (east) to the Horsemarsh Sewer (Drain)	Environment Agency
Five Watering Sewer	Main River	Walland Marsh, to East of Rother Levels	Environment Agency
Fourth Government Drain (M6)	Main River	South East of Warehorne crosses A2070, parallel to Royal Military Canal (north).	Environment Agency
Great Stour	Main River	From Stonebridge Green, through Little Chart, Godinton Park, A28, Victoria Park, under railway station through Ashford Town, A292, Gore hill, M20, A2070, to the West of Wye, crosses A28 South of Godmersham, then returns across A28 East of Chilham to North of Shalmsford Street.	Environment Agency
Highknock Channel	Main River	East of Military Road, South of Appledore, through Walland Marsh.	Environment Agency
Horsemarsh Sewer (M28)	Main River	South East of Kenardington, running parallel (west) to the First Speringbrook Sewer (M25)	Environment Agency
Kennington Stream	Main River	South East of Bybrook flowing south east into the Great Stour	Environment Agency
Newknock Channel	Main River	South of Appledore, parallel to Royal Military Canal.	Environment Agency
Newmill Channel (M10)	Main River	From West of Tenterden, flowing south, crossing A28 (adjacent to Rolvenden Station), to where it joins the Reading Sewer (M14), North of Potman's Heath.	Environment Agency
Reading Sewer (M14)	Main River	North East from Potman's Heath, passing south of Small Hythe, North of Isle of Oxney, North East of Chapel Bank to where it joins Newknock Channel and Highknock Channel.	Environment Agency
River Beult	Main River	The river flows south of Bethersden by A2; in Bethersden; and west of Chambers' Green. These two branches merge West of Bethersden, in Birch Wood. This then merges with the reach of the River Beult south west of Smarden, before passing to the South of Smarden.	Environment Agency

Watercourse	Type	Location	Responsible Party
River Rother (M16)	Main River	North of Newenden and East of A28, it crosses Kent and East Sussex Railway line, passes South of Potman's Heath and through Rother Levels.	Environment Agency
Royal Military Canal	Main River	The canal that runs north from Appledore to east of Bilsington. Crosses A2070 South East of Warehorne.	Environment Agency
Ruckinge Dyke	Main River	From Birchett Wood (South of Bromley Green), crosses A2070, A2042 to its confluence with East Stour, South of South Willesborough.	Environment Agency
Second Government Drain (M4)	Main River	South of Bilsington, parallel to Royal Military Road.	Environment Agency
Second Marshland Sewer (M12)	Main River	South East of Bilsington	Environment Agency
Second New Sewer (M15)	Main River	Parallel to B2080 in Snargate.	Environment Agency
Sedbrook Sewer (M22)	Main River	Located in Romney Marsh IDB, crosses A2070.	Environment Agency
Speringbrook Sewer	Main River	From Bourne Lane through Hamstreet (under the Street) flowing south towards the Royal Military Canal.	Environment Agency
Tenterden Sewer (M18)	Main River	Flows North - South, to the East of Shirley Moor, in Romney Marsh IDB.	Environment Agency
Third Government Drain (M5)	Main River	Along Royal Military Road, South of Ruckinge.	Environment Agency
Union Channel (M46)	Main River	South of Walland Marsh	Environment Agency
White Kemp Sewer (M5)	Main River	Located in Romney Marsh IDB, West of New Buildings Farm.	Environment Agency
Whitewater Dyke	Main River	Flowing North East from Shadoxhurst to its confluence with East Stour, East of Beaver.	Environment Agency
Abbatridge	Ordinary Watercourse	North East of Snargate	Local Authority, Riparian Owner
Abbatridge Sewer	Ordinary Watercourse	East of Snargate	Local Authority, Riparian Owner
Appledore	Ordinary Watercourse	South East of Appledore	Local Authority, Riparian Owner
Appledore Sewer	Ordinary Watercourse	East of Appledore	Local Authority, Riparian Owner
Bate's	Ordinary Watercourse	West of Wittersham	Local Authority, Riparian Owner
Bate's Gill	Ordinary Watercourse	South West of Wittersham	Local Authority, Riparian Owner
Becket Sewer	Ordinary Watercourse	South West of Walland Marsh	Local Authority, Riparian Owner
Beckley	Ordinary Watercourse	North East of Knelle Wood	Local Authority, Riparian Owner
Beckley Sewer	Ordinary Watercourse	North of Knelle Wood	Local Authority, Riparian Owner
Bent Hope Sewer	Ordinary Watercourse	South of Walland Marsh	Local Authority, Riparian Owner
Bentley	Ordinary Watercourse	South West of Walland Marsh	Local Authority, Riparian Owner
Bentley Sewer	Ordinary Watercourse	East of Walland Marsh	Local Authority, Riparian Owner
Bilsington Sewer	Ordinary Watercourse	North West of Newchurch	Local Authority, Riparian Owner
Bourne	Ordinary Watercourse	North of Hinxhill	Local Authority, Riparian Owner
Bourne Dyke	Ordinary Watercourse	North East of Blackwell Farm	Local Authority, Riparian Owner
Bower Road Stream	Ordinary Watercourse	South East of Mersham	Local Authority, Riparian Owner
Brenzett Sewer	Ordinary Watercourse	North, and West, of Lodgeland Farm	Local Authority, Riparian Owner
Claybridge Stream	Ordinary Watercourse	East of Hareplain	Local Authority, Riparian Owner
Cradlebridge Sewer	Ordinary Watercourse	West of Appledore Heath	Local Authority, Riparian Owner
Crane	Ordinary Watercourse	North East of Golford	Local Authority, Riparian Owner

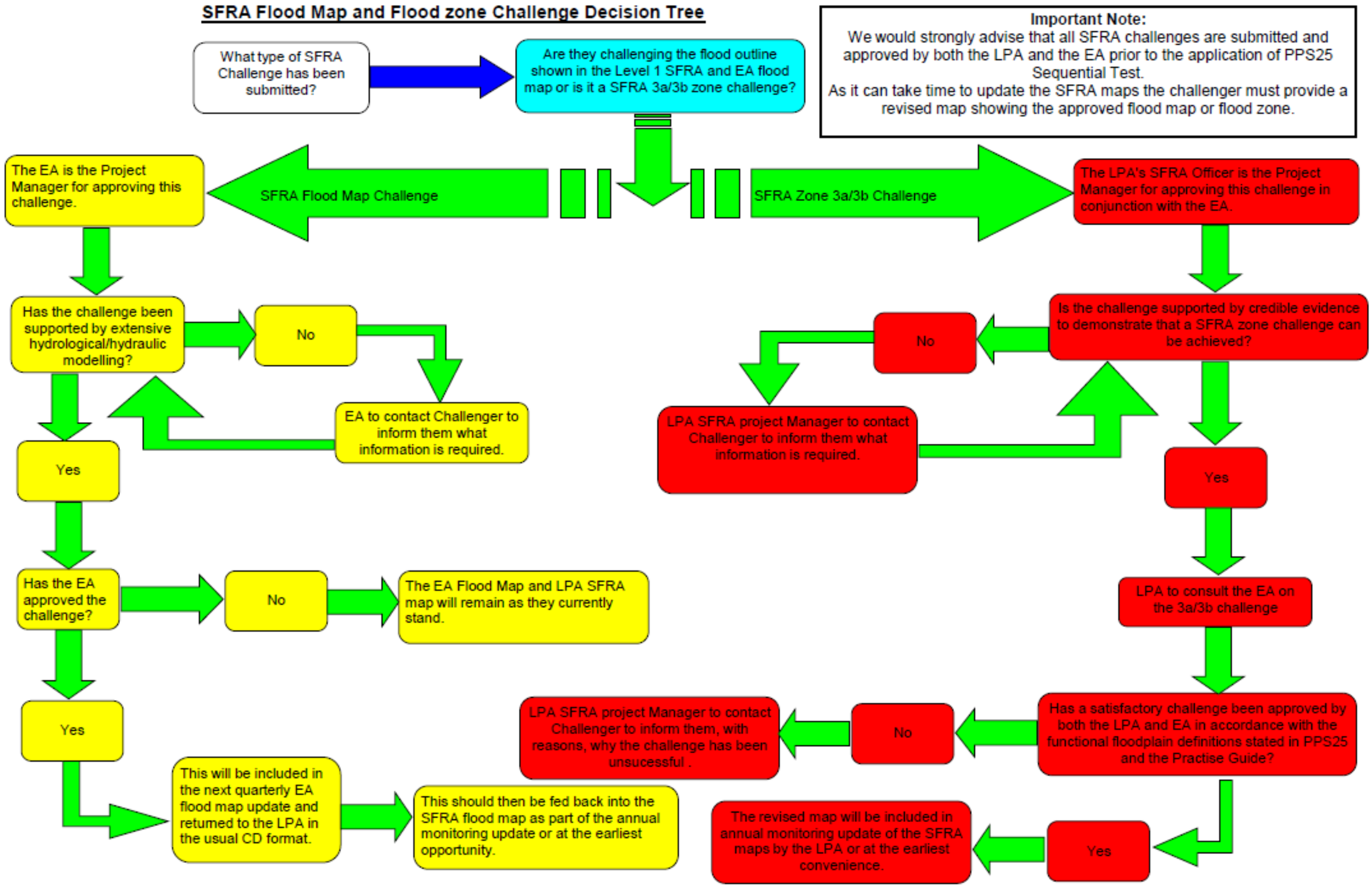
Watercourse	Type	Location	Responsible Party
Daniel's Water	Ordinary Watercourse	South of Daniel's Water	Local Authority, Riparian Owner
Decoypond Ditch	Ordinary Watercourse	West of Summerhill	Local Authority, Riparian Owner
Duke's Spring	Ordinary Watercourse	South East of Eastwell Lake	Local Authority, Riparian Owner
Eastbridge Sewer	Ordinary Watercourse	North East of New Church	Local Authority, Riparian Owner
Hammer Stream	Ordinary Watercourse	North West of Biddenden	Local Authority, Riparian Owner
Heron Pond	Ordinary Watercourse	West of Brabourne Lees	Local Authority, Riparian Owner
Hexden Channel	Ordinary Watercourse	North of Newenden	Local Authority, Riparian Owner
Hoorne's	Ordinary Watercourse	North West of Burmarsh	Local Authority, Riparian Owner
Hoorne's Sewer	Ordinary Watercourse	North West of Burmarsh	Local Authority, Riparian Owner
Hurst Sewer	Ordinary Watercourse	North East of Hurst Farm	Local Authority, Riparian Owner
Lady's Well	Ordinary Watercourse	South East of Hothfield	Local Authority, Riparian Owner
Marshland Sewer	Ordinary Watercourse	South East of Bilsington	Local Authority, Riparian Owner
Maytham Sewer	Ordinary Watercourse	South West of Potman's Heath	Local Authority, Riparian Owner
Mill Dam	Ordinary Watercourse	North of Stonestreet Green	Local Authority, Riparian Owner
Puddledock Sewer	Ordinary Watercourse	East, and South, of Becket's Court	Local Authority, Riparian Owner
Pump Sewer	Ordinary Watercourse	South East of Swallowstail	Local Authority, Riparian Owner
Reading Sewer	Ordinary Watercourse	North of Isle of Oxney, West of Reading Street	Local Authority, Riparian Owner
River Stour (Kent) IDB Drains	Ordinary Watercourse	see Figure 3.1Figure 3-1	River Stour (Kent) Internal Drainage Board
Romney Marsh IDB Drains	Ordinary Watercourse	see Figure 3.1Figure 3-1	Romney Marsh Internal Drainage Board
Sedbrook Sewer	Ordinary Watercourse	South of Ruckinge	Local Authority, Riparian Owner
Sheaty Sewer	Ordinary Watercourse	West of Newchurch	Local Authority, Riparian Owner
Sherway	Ordinary Watercourse	North, and West, of Swift's Green	Local Authority, Riparian Owner
Snargate Sewer	Ordinary Watercourse	North East of Swallowstail	Local Authority, Riparian Owner
Sparkes Gill	Ordinary Watercourse	North East of Rolvenden	Local Authority, Riparian Owner
Start Marsh Sewer	Ordinary Watercourse	North of Potman's Heath	Local Authority, Riparian Owner
Tilder Gill	Ordinary Watercourse	South East of Tenterden	Local Authority, Riparian Owner
Upper Medway IDB Drains	Ordinary Watercourse	see Figure 3.1 (to the west of the borough)Figure 3-1	Upper Medway Internal Drainage Board
Wallsfoot Sewer	Ordinary Watercourse	Between Newchurch and Bilsington	Local Authority, Riparian Owner
White	Ordinary Watercourse	West of New Buildings Farm	Local Authority, Riparian Owner
Wittersham Sewer	Ordinary Watercourse	West of Ham Green	Local Authority, Riparian Owner
Woodside Stream	Ordinary Watercourse	North West of Moat Farm	Local Authority, Riparian Owner

B Site Submissions - Flood Constraint

Table B2: Site Submissions and Flood Constraints (Refer to Section 5.3)

C Site Submission Summary Sheets -

D Challenge Flood Maps and Flood Zones



E Maps

Offices at
Coleshill
Doncaster
Edinburgh
Haywards Heath
Limerick
Newcastle upon Tyne
Newport
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

Registered Office
South Barn
Broughton Hall
SKIPTON
North Yorkshire
BD23 3AE

t:+44(0)1756 799919
e:info@jbagroup.co.uk

JBA Group Limited
Registered in England
6396638

Visit our website
www.jbagroup.co.uk