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# **Sevenoaks Stage 1 Surface Water Management Plan**

**FINAL Report**

**October 2013**

**Kent County Council  
County Hall  
MAIDSTONE  
Kent  
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## Contract

This report describes work commissioned by Kent County Council, under commission reference LL049. Kent County Councils' representative for the contract was Max Tant of Kent County Council. Margaret Moran and Rachel Huitson Little of JBA Consulting carried out this work.

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## Purpose

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## Acknowledgements

We would like to acknowledge and thank Sevenoaks District Council, Upper Medway IDB, Southern Water, Thames Water, Environment Agency and Kent County Council for all their assistance during this project.

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## Abbreviations and Glossary of Terms

Term	Definition
CFMP	Catchment Flood Management Plan- A high-level planning strategy through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.
CIRIA	Construction Industry Research and Information Association
DA	Drainage Area
DEM	Digital Elevation Model
Drainage Area	Are defined for the purposes of this study using FMfSW (1 in 200 year (deep)), historic flooding records and policy areas as defined by Kent County Council
DTM	Digital Terrain Model
EA	Environment Agency
EU	European Union
Flood defence	Infrastructure used to protect an area against floods as floodwalls and embankments; they are designed to a specific standard of protection (design standard).
Flood Risk Area	An area determined as having a significant risk of flooding in accordance with guidance published by Defra and WAG (Welsh Assembly Government).
Flood Risk Regulations	Transposition of the EU Floods Directive into UK law. The EU Floods Directive is a piece of European Community (EC) legislation to specifically address flood risk by prescribing a common framework for its measurement and management.
Floods and Water Management Act	Part of the UK Government's response to Sir Michael Pitt's Report on the Summer 2007 floods, the aim of which is to clarify the legislative framework for managing surface water flood risk in England.
Fluvial Flooding	Flooding resulting from water levels exceeding the bank level of a main river
FMfSW	Flood Map for Surface Water
IDB	Internal Drainage Board
JBA	Jeremy Benn Associates
KCC	Kent County Council
LLFA	Lead Local Flood Authority - Local Authority responsible for taking the lead on local flood risk management
Main River	A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers
NPPF	National Planning Policy Framework
NRD	National Receptor Dataset – a collection of risk receptors produced by the Environment Agency
Ordinary Watercourse	All watercourses that are not designated Main River. Local Authorities or, where they exist, IDBs have similar permissive powers as the Environment Agency in relation to flood defence work. However, the riparian owner has the responsibility of maintenance.
Pathway	The mechanism or method flood waters are directed to a location/ receptor.
PFRA	Preliminary Flood Risk Assessment
Receptor	The area at risk from receiving flood water
RFCC	Regional Flood & Coastal Committees
Risk	In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring, and the consequence of the flood.
RMA	Risk Management Authorities
SAB	SuDS Approving Body - responsible for approving, adopting and maintaining drainage plans and SuDS schemes that meet the National Standards for sustainable drainage.
SDC	Sevenoaks District Council
Sewer flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.
SFRA	Strategic Flood Risk Assessment
SHLAA	Strategic Housing Land Availability Assessment - The Strategic Housing Land Availability Assessment (SHLAA) is a technical piece of evidence to support the Core Strategy and Sites & Policies Development Plan Documents (DPDs). Its purpose is to demonstrate that there is a supply of housing land in the District which is suitable and deliverable.
Source	Source of flooding i.e. heavy rainfall
Stakeholder	A person or organisation affected by the problem or solution, or interested in the

Term	Definition
	problem or solution. They can be individuals or organisations, includes the public and communities.
SuDS	Sustainable Drainage Systems - Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques
Surface water flooding	Flooding as a result of surface water runoff as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or watercourse, or cannot enter it because the network is full to capacity, thus causing what is known as pluvial flooding.
SW	Southern Water
SWMP	Surface Water Management Plan - The SWMP plan should outline the preferred surface water management strategy and identify the actions, timescales and responsibilities of each partner. It is the principal output from the SWMP study.
SDC	Sevenoaks District Council
UMIDB	Upper Medway Internal Drainage Board

# 1 Introduction

## 1.1 What is a Surface Water Management Plan

A Surface Water Management Plan (SWMP) is a study to understand the flood risks that arise 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 the Lead Local Flood Authority (Kent County Council) in partnership with other flood risk management authorities. In relation to the Stage 1 SWMP, risk management authorities include Kent County Council, Local Authority, Environment Agency, Internal Drainage Boards (IDBs), Thames Water, Southern Water 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. Although 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 reviewed periodically.

This SWMP is being undertaken by Kent County Council (KCC) to investigate the local flood risks in Sevenoaks 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. Sevenoaks District has been identified as an area potentially at risk of local flooding in the Preliminary Flood Risk Assessment<sup>1</sup>, which KCC undertook in 2011 for the whole county of Kent. This SWMP will determine whether there are any local flood risks and what further work may be needed. To find out more about KCC's role and other SWMPs they are undertaking, please visit their website:

[www.kent.gov.uk/flooding](http://www.kent.gov.uk/flooding)

## 1.2 Summary of aims and objectives

The main aims and objectives of the Sevenoaks Stage 1 SWMP are detailed below:

1. The establishment of a local partnership;
2. The collation of a comprehensive flood history for all relevant local flood risk sources;
3. The identification, collation and mapping of all available flood data and its availability for future use including an assessment of the reliability of the data;
4. The identification, where possible from the available data, of flood prone areas;
5. The identification of areas where existing data may be missing or unreliable, as a consequence of inappropriate local assumptions, additional local features or any other reason, and options to improve our understanding;
6. The identification of areas where the risks are from a combination of sources;
7. Identification of any proposed or allocated development sites and any impacts they may have on local flood risks;
8. The preparation of source pathway receptor models for all the risks and sources that are identified;
9. The identification of any easy win opportunities that are apparent without further work, which may include planning policies or simple flood defence measures; and
10. A clear plan for further work, which may include:
  - a. What needs to be achieved to reduce flood risk, including next steps;
  - b. The owner of the actions;
  - c. The timeframe for undertaking them; and
  - d. Indicative costs.

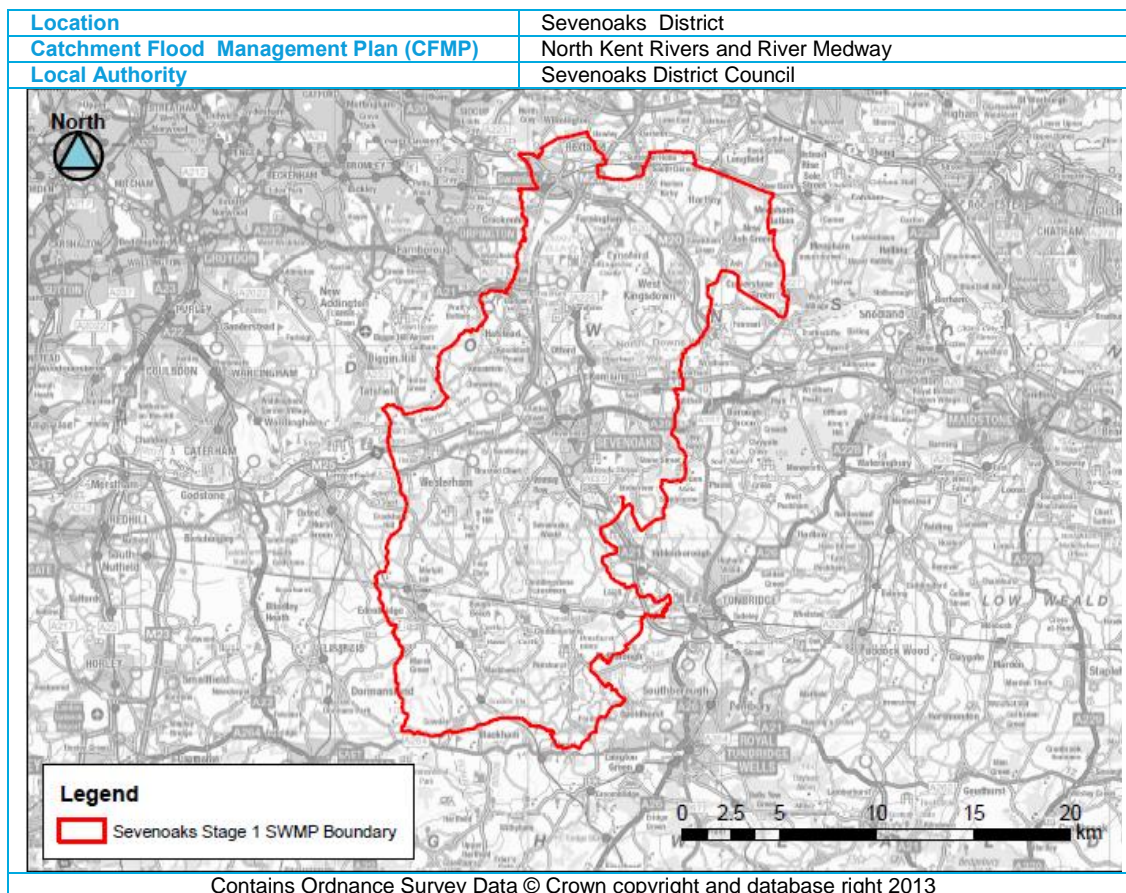
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<sup>1</sup> Kent County Council (2011) Preliminary Flood Risk Assessment available at <http://publications.environment-agency.gov.uk/PDF/FLHO1211BVSI-E-E.pdf>  
2012s6728 - Sevenoaks Stage 1 SWMP (v1.0 Oct 2013)



### 1.3 Study area

The SWMP study area includes Sevenoaks district boundary. Figure 1.1 describes the extent of the study area.



**Figure 1.1 Study Area**

#### 1.3.1 Catchment Flood Management Plan (CFMP)

Catchment Flood Management Plans give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years. They consider all types of inland flooding, and take into account the likely impacts of climate change, the effects of how land is used and managed. Their development involves wide and prolonged consultation.

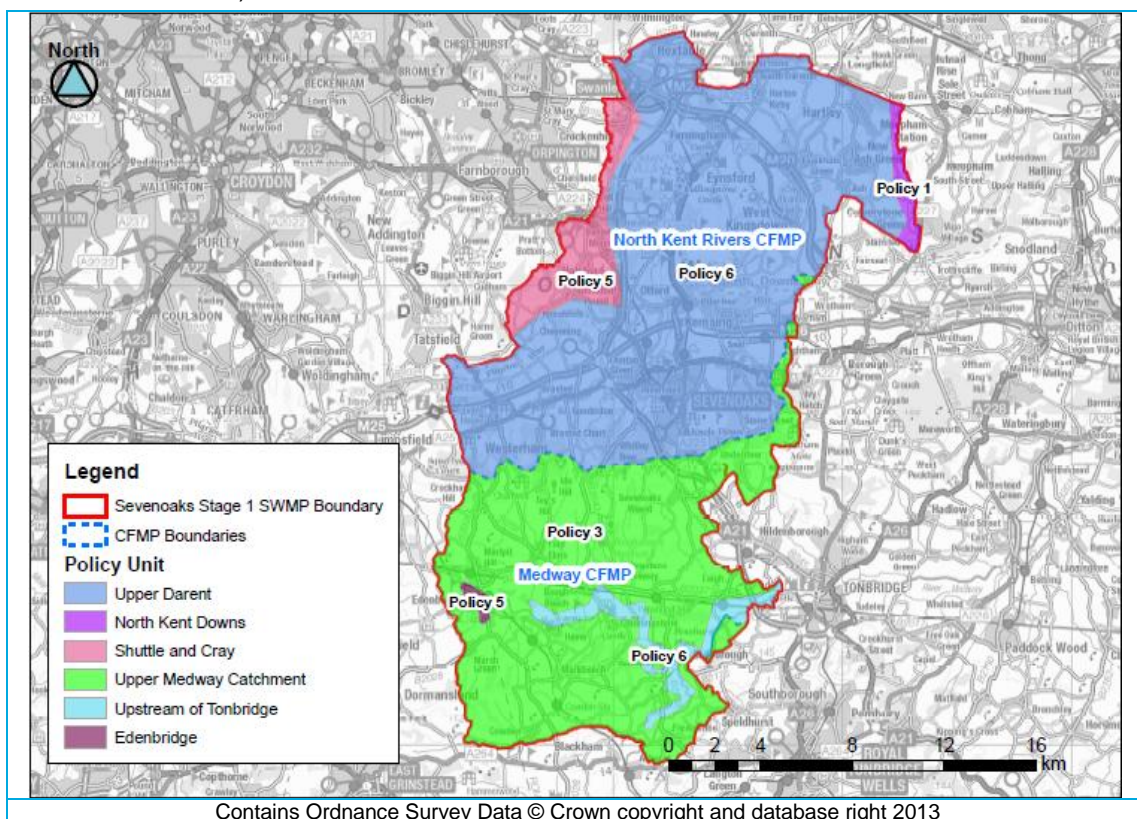
Sevenoaks district falls within two river catchments and, as such, within two CFMP's as illustrated in Figure 1.2. It is important that work undertaken within the district is mindful of the flood risk management policies set by these high level strategic plans.

1. North Kent Rivers CFMP
2. 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'. 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 1.2 illustrates which policy has been applied to each policy unit:

- Policy 1 – No active intervention (including flood warning and maintenance). Continue to monitor and advice.
- 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).



**Figure 1.2 CFMP Policy Units and Applicable Policies<sup>2</sup>**

### 1.3.2 Surface Water

Surface water presents a risk throughout Sevenoaks. When there are instances of heavy rainfall and water fails to infiltrate to the ground or enter the drainage system there is an increased risk of surface water flooding. Ponding generally occurs at low points in the topography. Historically there have been events attributed to surface water; however the likelihood of flooding is dependent on not only the rate of runoff but also the condition of the surface water drainage (surface water sewers, KCC Highways drains and gullies, open channels, ordinary watercourses and SuDS).

There are two sources of information available from the Environment Agency, relating to the identification of potential surface water flood risk in Sevenoaks. These are:

- Areas Susceptible to Surface Water Flooding (ASStWF) - Since July 2009, these maps have been available to Local Resilience Forums and Local Planning Authorities, and provided a starting point in understanding the broad areas where surface water flooding is likely to cause problems
- Flood Maps for Surface Water (FMfSW) - these followed on from the ASStWF maps and provide a more realistic representation than the ASStWF maps in many

<sup>2</sup> **Please note:** the boundaries of the CFMP Policy Units have been digitised approximately from the relevant CFMP available from <http://www.environment-agency.gov.uk/research/planning/33586.aspx>  
2012s6728 - Sevenoaks Stage 1 SWMP (v1.0 Oct 2013)

circumstances. The Environment Agency considers this to be the national source of information<sup>3</sup>.

It should be noted that the Environment Agency are currently updating national surface water mapping and will soon be releasing the Updated Flood Map for Surface Water (UFMfSW). The UFMfSW aims to provide an improvement on the representation of surface water flood risk across England and Wales. The UFMfSW are due to be released by the end of 2013. Therefore, for the purposes of this report the FMfSW datasets have been used.

### 1.3.3 Watercourses

#### Main Rivers

'Main River' is a legal term used to classify watercourses that have the potential to cause significant flooding. The Environment Agency has permissive powers to carry out maintenance and improvement works on these rivers. The Stage 1 SWMP makes reference to Main Rivers throughout the report. However, it is important to note the focus of the study is local flooding issues relating to surface water and/ or a combination of flooding sources. Table 1-1 describes the list of Main Rivers, which are managed by the Environment Agency within Sevenoaks.

**Table 1-1 List of Main Rivers**

Catchment	Watercourse
Medway	Eden Brook
	Hilden Brook
	Penlee
	River Eden
	River Medway
	Skinner Stream
	St. Brelades Stream
North Kent Rivers	Honeypot Stream
	Madan Road Stream
	River Darent
	Watercress Stream
	Westerham stream

#### Ordinary Watercourse

Ordinary watercourses are watercourses that are not designated as Main Rivers, and are usually the smaller tributaries of them. KCC, Sevenoaks District Council and Internal Drainage Boards<sup>4</sup> have permissive powers to carry out works on ordinary watercourses and also have responsibilities in relation to consenting and enforcement. Figure 1.3 shows that the Upper Medway IDB (UMIDB) is the only IDB in Sevenoaks district.

The flooding mechanism for ordinary watercourses is similar to flooding from rivers. Due to the small nature of ordinary watercourses and the sometimes complex drainage mechanisms they may have (such as sluice gates, weirs and pumps), the risk can be difficult to assess. However, ordinary watercourses are generally considered to be low risk systems that do not pose a flood risk on the same scale as main rivers; however they still pose a local flood risk.

There is a high concentration of ordinary watercourses within Sevenoaks district, specifically in the mid and southern regions. Drainage is complex and one severe rainfall event can cause flooding on a number of ordinary watercourses simultaneously. A flood event can be exacerbated, especially if it is combined with high levels on Main Rivers.

#### Riparian Owners

<sup>3</sup> Environment Agency (2012) Flooding from Surface Water - available at <http://www.environment-agency.gov.uk/research/planning/109490.aspx>

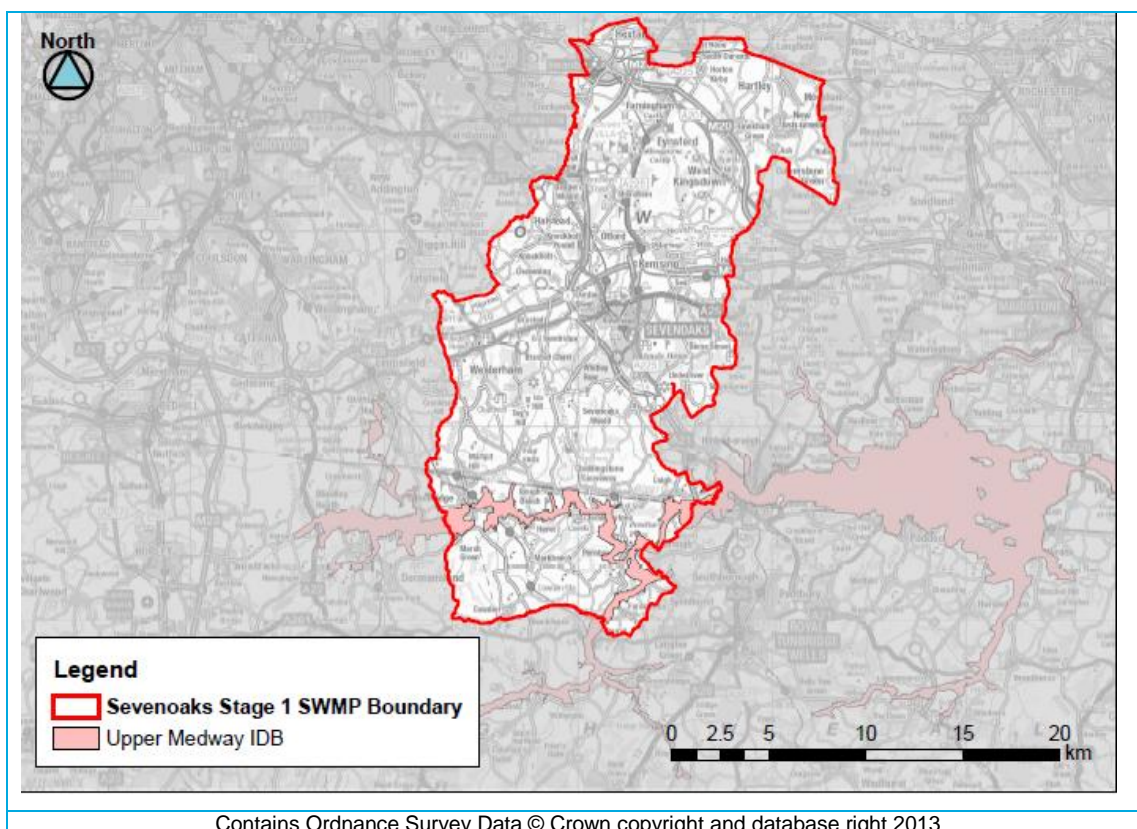
<sup>4</sup> An Internal Drainage Board's permissive powers pertain to those ordinary watercourses within their boundaries. 2012s6728 - Sevenoaks Stage 1 SWMP (v1.0 Oct 2013)



If you own land adjoining a watercourse, you have certain rights and responsibilities, and in legal terms you are a 'riparian owner'. Some of your responsibilities include:

- Maintaining river beds and banks;
- Allowing the flow of water to pass without obstruction; and
- Controlling invasive alien species such as Japanese knotweed.

Riparian owners should read the Environment Agency publication 'Living on the Edge' (2013) to find out more information about their responsibilities<sup>5</sup>.



**Figure 1.3 Location of IDBs within Sevenoaks**

### 1.3.4 Sewers

Thames Water is responsible for the sewers in the northern and mid region of Sevenoaks. Records show that the majority of sewers within the Sevenoaks study area are located in urban areas, such as Sevenoaks Town. Predominantly the sewers are classified as combined within Sevenoaks Town with some surface water. Foul sewers are located in the rural areas with some small sections of surface water located in New Ash Green.

Southern Water is responsible for the sewers in southern region of Sevenoaks and Edenbridge. Data provided shows that sewers are combined sewers, however in Edenbridge there are some surface water sewers present. In rural areas the majority of sewers are foul.

There are sewer models available from Southern Water for the southern part of Sevenoaks district. The location data was requested but it was not available at the time of writing this report. Thames Water has not confirmed the presence of sewer models for the remainder of the Sevenoaks district.

## 1.4 Using this report

Use Table 1-2 to find the information that you need.

<sup>5</sup> Environment Agency (2012) *Living on the Edge*

**Table 1-2 Report layout**

Section	Description of contents
1. Introduction	This section defines objectives of the stage 1 SWMP and describes the background of the study area.
2. Preparation	This section provides a summary of the key partners and consultation, data collected and a brief summary of the historic flooding collected. It introduces the source-pathway-receptor model and outlines how local sources of flood risk have been assessed.
3. Sustainable Drainage	Provides details on the suitability of SuDS within Sevenoaks.
4. SWMP Action Plan	Provides details of the generic and location specific Action Plan and potential funding opportunities.
Appendix A - Data Review	Provides a list of the data provided by the key partners for use in this project and its applicability to the Stage 1 SWMP.
Appendix B - Detailed Summary Sheets and Mapping	The summary sheets give a brief description of the source pathway receptor model within individual drainage areas. The mapping illustrates historical flooding
Appendix C - Flood History Table	A table recording flood history data provided by the key partners, describing : <ul style="list-style-type: none"> <li>- Receptor</li> <li>- Date (Month/ Year) - of the flood event, if provided</li> <li>- Location (Area/Road/ Street etc)</li> <li>- Source - perceived source of flooding</li> <li>- No. of properties affected</li> <li>- Source supplied data (organisation)</li> <li>- Source supplied data (report)</li> <li>- Comments - any additional comments provided within the data or through discussion at workshops.</li> </ul>
Addendum 1	KCC Highways Issues - A table of historic records highlighted during the analysis of data received from the key partners that for the most part solely related to KCC Highways. <b>This Addendum is to be included within the report at the discretion of KCC.</b>
Addendum 2	Southern Water A table of historic records that require further investigation from Southern Water. <b>This Addendum is to be included within the report at the discretion of KCC and Southern Water.</b>
Addendum 3	Thames Water - A table of issues highlighted within the analysis of historical flood information and where there may be potential for further action. <b>This Addendum is to be included at the discretion of KCC and Thames Water.</b>



## 2 Preparation

### 2.1 Partnership Approach

Local flooding cannot be managed by a single authority, organisation or partner; all the key organisations and decision-makers must work together to plan and act to manage local flooding across Sevenoaks district. Many organisations have rights and responsibilities for management of local flooding, KCC are the designated Lead Local Flood Authority (LLFA). Although Kent County Council has commissioned this project, the key partners have been consulted with at appropriate stages in the study. Working in partnership encourages co-operation between different agencies and enables all parties to make informed decisions and agree the most cost effective way of managing local flood risk across Sevenoaks district over the long term. The partnership process is also designed to encourage the development of innovative solutions and practices; and improve understanding of local flooding.

#### 2.1.1 Key Partners

Partners are defined as organisations with responsibility for the decision or actions that need to be taken to manage local flood risk. The key partners involved in this project are:

- Sevenoaks District Council
- Kent County Council
- Kent County Council - Highways
- Upper Medway IDB
- Environment Agency
- Southern Water
- Thames Water

The Stage 1 SWMP was undertaken to determine whether there are any local flood risks within Sevenoaks district that may require further work and / or investigation. In fulfilling this objective, the decision was made only to consult with the key partners noted above. Future studies that may be undertaken at a more local level will seek to widen this consultation to include parish and / or town councils, other community groups or local people. During the course of the study the key partners were involved in the following engagement events:

- Data gathering exercise and one to one meetings with each of the key partners
- Action plan workshop

### 2.2 Data Collation and Review

JBA Consulting met with each key partner, to discuss their knowledge and experience in relation to all sources of flooding across the study area. Data was collected from all key partners and the quality of the data was assessed and uncertainty or perceived weakness described and discussed with the key partners. A table summarising the data collected is located in Appendix A. A vast array of information was made available to inform the SWMP, including:

- The Environment Agency historical flood maps, FMfSW and LIDAR were used to delineate the individual drainage areas and define the receptive receptors within Sevenoaks.
- Records of historic flooding from KCC, KCC Highways, Sevenoaks District Council (SDC), UMIDB, Thames Water and Southern Water (were used to identify areas where actions are required within Sevenoaks). It should be noted that many of the historic records, specifically from KCC Highways only went back as far as 2008.
- Bedrock geology and superficial soils were informative when delineating individual drainage areas and also used to determine the applicability of SuDS type across the Sevenoaks district.
- The National Receptor Database (NRD) was used and was found to be informative when quantifying risk and prioritising potential measures and actions. The NRD was

not used to determine numbers potentially affected by flooding but rather to indicate the critical infrastructure that may be impacted by local flooding.

- Other data which was used included the Sevenoaks SFRA<sup>6</sup> and anecdotal information collected while meeting with the key partners.

## 2.3 Historical Flooding

Each Risk Management Authority (RMA) provided data on incidents of historical flooding. The records begin in 1958 to the present; there are a number of records that do not have a date specified. Historical flooding maps are displayed in Appendix B and the flood history tables are located in Appendix C. These have been compiled to provide further details on each recorded event received from all RMAs.

Historical flooding from Main Rivers has been described within the flood history table and displayed on the historical flooding maps, where key partners have provided records. It should be noted that Main River flooding has been included within this report to determine where a combination of issues (surface water, sewer, and groundwater) require an action. However, if an issue is solely related to Main River flooding, an action has not been prescribed as this is outside the remit of the Stage 1 SWMP. Actions to address flood risk from Main Rivers are considered within the Catchment Flood Management Plans (CFMPs).

A summary of historical flooding is noted below. Although the sources of flooding have been segregated into fluvial, surface water and sewers the issues highlighted within the summary may have originated from a number of sources.

### Fluvial

Within Sevenoaks, it has been highlighted through the flood history that there are issues with insufficient capacity in watercourse and their culverts. During extreme events these watercourses and their respective infrastructure (culverts) have surcharged in the past. Reported examples include events on Cray Road, Crockenhill and Bradbourne Vale. There have also been issues with unmaintained watercourses where blocked trash screens and culverts have caused problems.

Along Coppings Road there have been reports where flooding has been attributed to blocked drains and gullies and a local ordinary watercourse. Issues could be attributed to a combination of sources. This is also an example of high levels in a watercourse having a knock-on effect on highway drainage. Similar events have been described on Hartfield Road.

An ordinary watercourse north of Marlpit and south of Four Elms reportedly flooded in 1958 and 1960. There are also records from KCC highways and the Environment Agency which describe flooding on local roads from ordinary watercourses throughout Sevenoaks. Properties have been recorded as being affected in the past; examples include Hartfield Road and Kippington.

The River Darent (Main River) is recorded as affecting Eynsford, Shoreham, Chipstead, Farningham, Otford, Sundridge, Brasted and Westerham. Dated events include 1968, 1969, 1971, 1972, 1976 and in 2003. The River Medway (Main River) has affected Leigh and Penhurst. The River Eden affects Edenbridge and Penshurst. Edenbridge has regularly suffered flooding from the River Eden (Main River); key partners have explained that this may be due to the infrastructure through the town being unable to convey flows in extreme events.

### Surface Water

The historical records are dispersed throughout the district. It should be noted that records from KCC Highways are from the period of June 2008 to January 2013. There are limited records of older events from other key partners, the majority of records were provided from Kent County Council Highways. Information was also extracted from the Sevenoaks SFRA.

For the most part surface water flooding could be attributed to heavy rainfall overloading carriageways, drains/ gullies. There are a number of flood events within Sevenoaks attributed to surface water, particularly north west of Knole Park. In other instances, the cause of flooding was perceived to be from blocked drains/ gullies or due to high levels within receiving

<sup>6</sup>Sevenoaks Strategic Flood Risk Assessment (2008)

watercourses impeding free discharge from surface water drains and gullies. Examples of areas where high levels in local watercourses affecting highway drainage have been discussed above (Hartfield Road and Coppings Road).

### Sewer

Southern Water provided records of historical flooding within Sevenoaks district. 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.

Thames Water provided information of their recorded events based on postcode sectors (TN13 1), and as with Southern Water indicated whether the flooding was internal/ external. Where further information was provided upon discussion with the key partners, this was added to the comments within the Flood History Table in Appendix C. Southern Water and Thames Water have been made aware of any specific locations where historic records indicate that a combination of sources may affect sewer flooding.

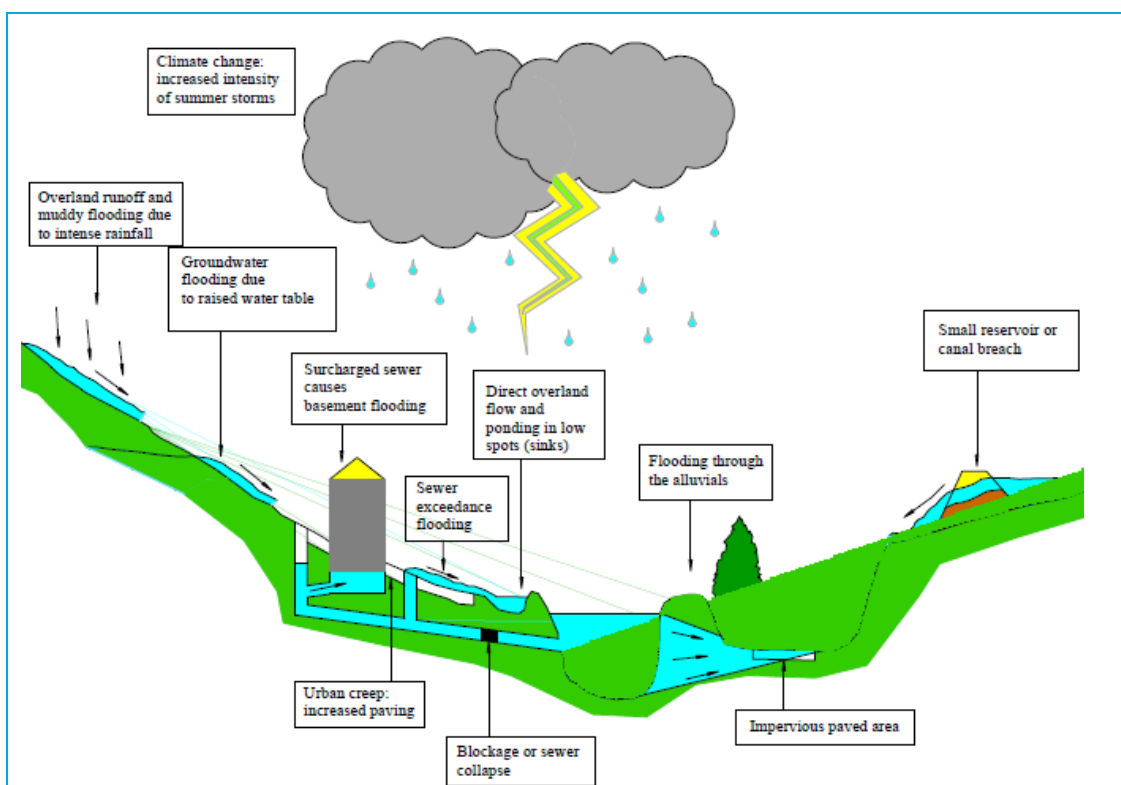
The Sevenoaks SFRA highlights there may be an issue with foul sewer flooding in Crockenhill. There are numerous incidents of sewer flooding within Sevenoaks town. There is a repeated issue of blockages caused by the disposal of Fats Oils and Grease (FOGs) within the sewer, particularly on Station Road, Sevenoaks. There were also repeated events of hydraulic overload reported on London Road, Sevenoaks.

### Other

Eynsford is reported as being prone to groundwater flooding. However, it should be noted from the data provided and following consultation with the key partners, it is difficult to ascertain if a source of flooding is from groundwater. This is because flood risk may be as a result of a combination of sources, or a culverted watercourse may have been mistaken for a spring or underground stream.

## 2.4 Source Pathway Receptor

The Source-Pathway-Receptor concept can be used to highlight the processes that influence the flood risk in a given area. A simple schematic is illustrated in Figure 2.1.



**Figure 2.1 Source-Pathway-Receptor**

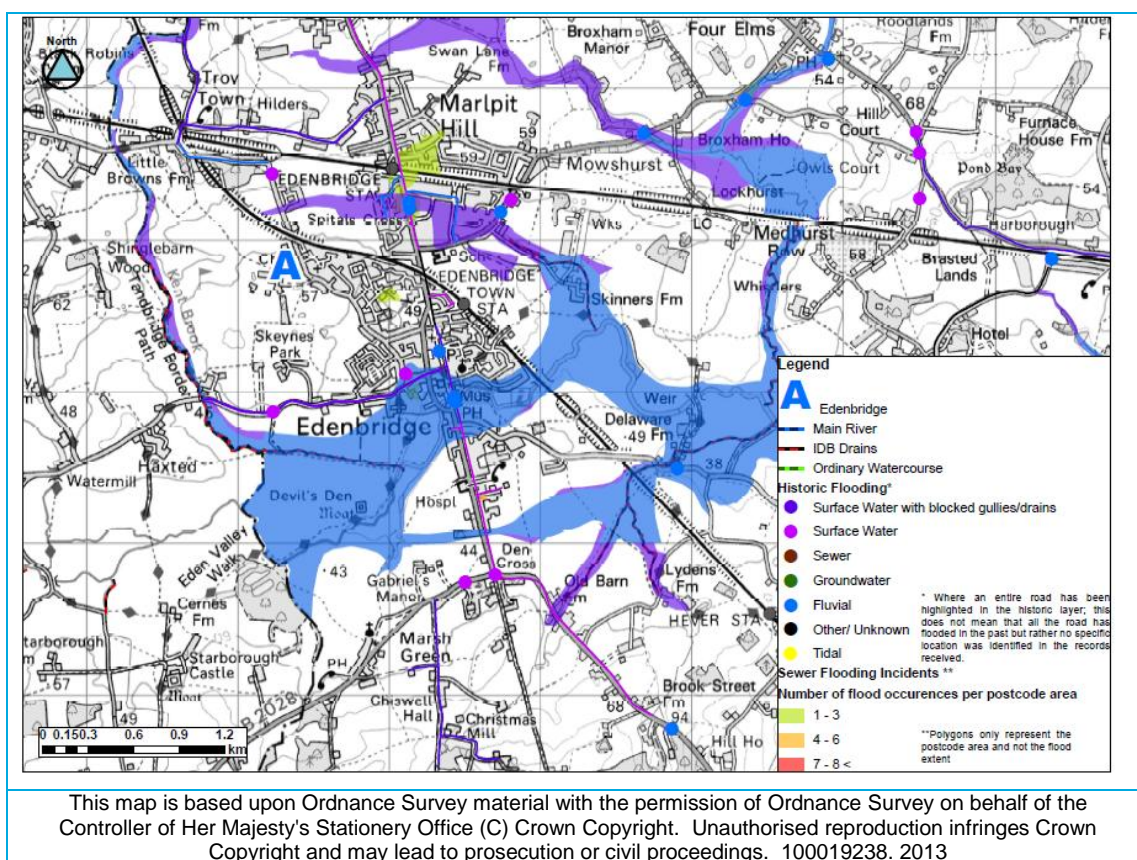
The sources of flood water in the study catchment are summarised below:

- Heavy rainfall resulting in surface water runoff and overloaded sewers
- Surface water (blocked drains / gullies)
- Rivers - overtopping of river banks
- Groundwater<sup>7</sup>

The pathways for flooding are the sewer networks, drains and gullies, highways/ roads and river networks within Sevenoaks district. Further detail on pathways is located in the summary sheets in Appendix B (see section 2.5 for discussion on summary sheets).

Receptors within the Sevenoaks study area were highlighted where supplied historic records indicate groupings of flood incidents in particular locations. In addition the FMfSW - 1 in 200 year (deep) was used to indicate where potential receptors may be located. It should be noted that the location of the receptor is not intended to specifically pinpoint an exact location (i.e. house, business or street) as a receptor. Rather, a receptor has been used to highlight an area, such as a settlement, for example, see Figure 2.2.

<sup>7</sup> It should be noted from the data provided and following consultation with the key partners, it is difficult to ascertain if a source of flooding is from groundwater. This is because flood risk may as a result of a combination of sources, or a culverted watercourse may have been mistaken for a spring or underground stream.



**Figure 2.2 Example of a Sevenoaks Stage 1 SWMP Receptor**

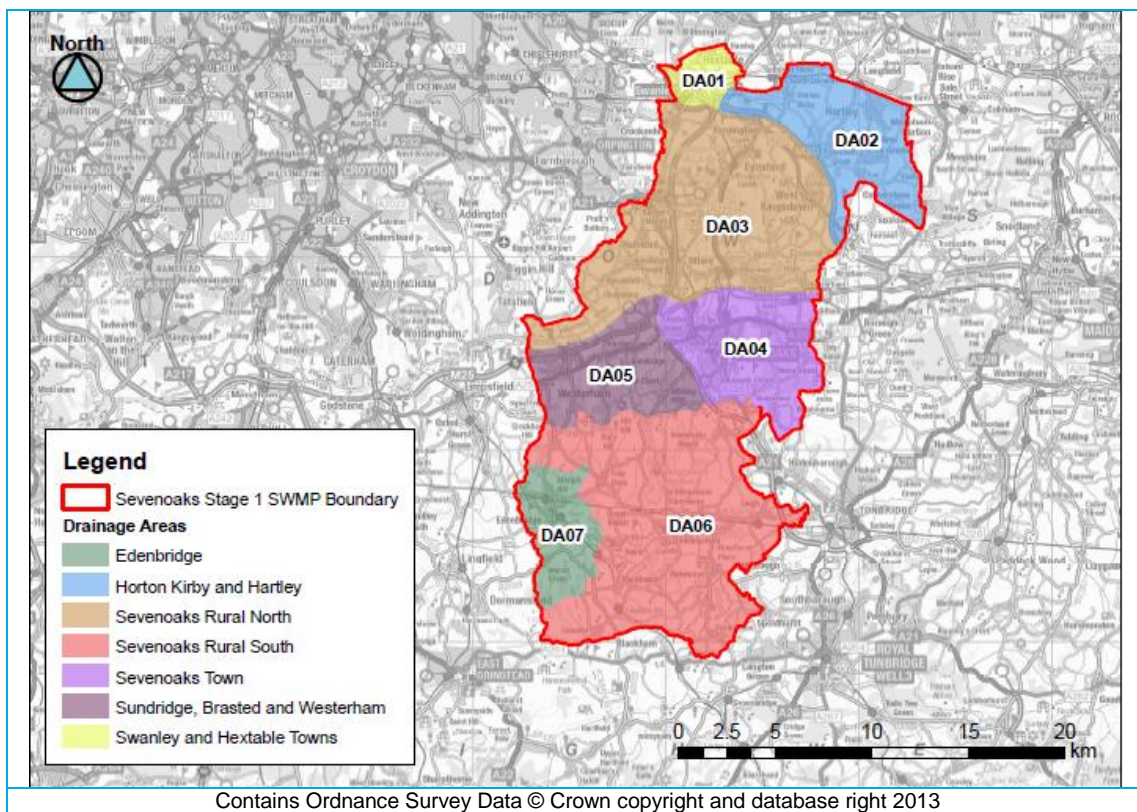
## 2.5 Communicating and mapping the risk

In order to consider the study area in more detail and enable partners and other interested parties to be able to focus in on certain areas of interest (aside from the whole SWMP area), Sevenoaks district has been split into drainage areas, see Table 2-1 and Figure 2.3. The drainage areas have been split using the topography of the landscape, historic events, mapped outlines and the Flood Maps for Surface Water (1 in 200-year, deep). In addition to historical records of flooding and the FMfSW, IDB boundaries (which are catchment based) and geological boundaries have also been used. Where appropriate these drainage areas have been used to influence KCCs Local Flood Risk Management Strategy policy units.

**Table 2-1 Sevenoaks Drainage Areas**

Drainage Area	Location
DA01	Swanley and Hextable
DA02	Horton Kirby and Hartley
DA03	Sevenoaks Rural North
DA04	Sevenoaks Town
DA05	Sundridge, Brasted and Westerham
DA06	Sevenoaks Rural South
DA07	Edenbridge





**Figure 2.3 Sevenoaks Drainage Areas**

Each drainage area has been described in detail in a corresponding summary sheet in Appendix B. Each summary sheet provides an overview of:

- the drainage area;
- its size;
- drainage assets i.e. main river, ordinary watercourse and sewer network; and
- highlights the source-pathway-receptor model within each area;

A historic flooding map is provided for each drainage area to accompany the summary sheet. This map details the location of the historic flood data as provided by the key partners and illustrates the location of the IDB Boundaries within Sevenoaks district.

In addition, each drainage area has a corresponding flood history table, which provides details of all recorded historic data, as provided by the key partners. The flood history tables are located in Appendix C, they include details on the:

- Year of the incident;
- General location;
- Perceived source as per the data provided;
- Whether property was recorded as being affected; and
- Any additional comments provided within the historic datasets.

## 2.6 Site Allocations

Sevenoaks District Council Allocations and Development Management Plan (DMD), draft for submission February 2013<sup>8</sup>, describes the policies for development areas such as Sevenoaks Town. Table 2-2 correlates the policy area, Drainage Areas and Receptors defined for Sevenoaks district.

<sup>8</sup> [Sevenoaks District Council Local Development Framework Allocations and Development Management Plan, Draft Submission February 2013](#). Please note that at the time of writing this report the Development Management Plan was at DRAFT stage.

Planners and developers should use this table to easily locate a site allocation, its relevance within the Allocations and Development Management Plan<sup>9</sup> and locate relevant data regarding local flood risk within the detailed summary sheets and mapping (Appendix B) and flood history table (Appendix C).

**Table 2-2 Policies relating to Development Areas**

Policy (February 2013)	Policy Reference (from DMD)	Drainage Area	Receptor	Receptor Name
Sustainable Communities and Development Principles	Policy SC 1	All	All	All
Environment	Policy EN1 - Policy EN4	All	All	All
Housing and Mixed Use Development	Policy H1 - Policy H4	All	All	All
The Economy and Employment	Policy EMP1 - Policy EMP5	All	All	All
Sevenoaks Town Centre	Policy TLC1	DA04	All	All
Swanley Town Centre	Policy TLC2	DA01	B, C & D	Swanley Village (B), Swanley West (C) and Swanley South (D)
Edenbridge Town Centre	Policy TLC3	DA07	A	Edenbridge
Neighbourhood and Village Centres	Policy TLC4	DA01 (A & B), DA02, DA03, DA05 and DA06	DA01 (A), DA02, DA03, DA05 and DA06 (All)	DA01 (Hexstable), DA02, DA03, DA05 and DA06 (All)

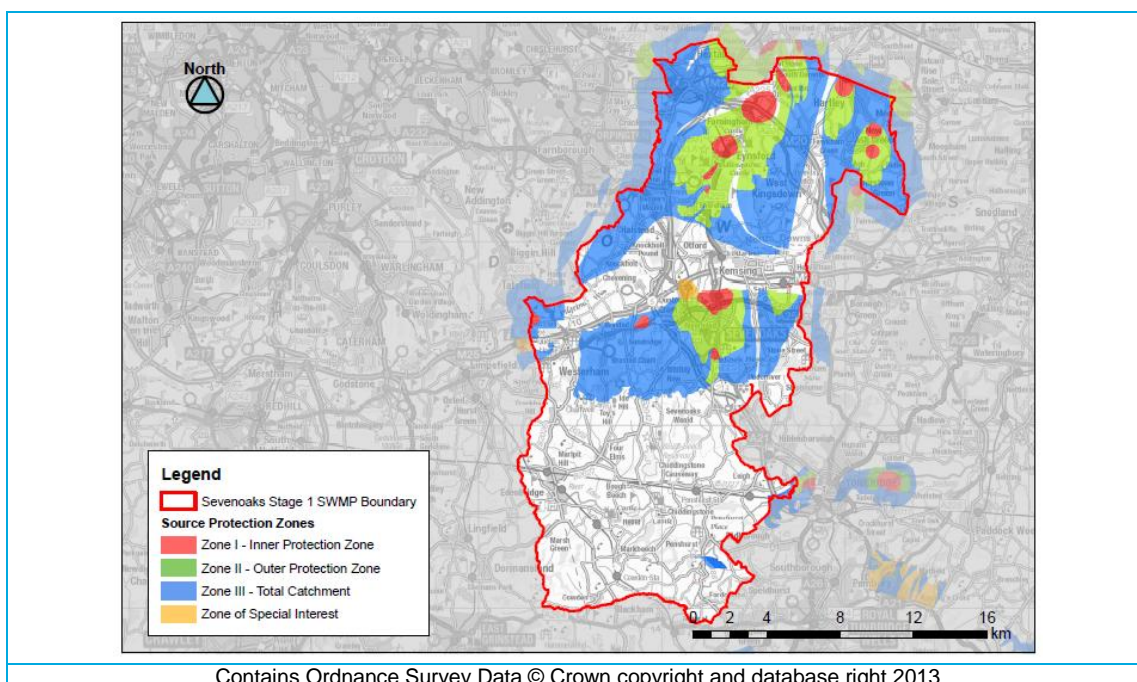
<sup>9</sup> The DRAFT Allocations and Development Management Plan should only be used in the interim period until the FINAL Allocations and Development Management Plan is adopted.  
2012s6728 - Sevenoaks Stage 1 SWMP (v1.0 Oct 2013)

## 3 Sustainable Drainage Systems

### 3.1.1 Feasibility of SuDS in Sevenoaks

The choice of SUDS technique is site-specific, depending on the nature of the proposed development and local conditions. The suitability of areas for different types of SUDS techniques is often determined by existing landuse and in the case of SUDS which involve infiltration, soil type, underlying geology and ground water conditions need also to be considered.

When considering infiltration options, groundwater source protection zones must also be considered. The Environment Agency's website provides a web based resource in order to check the Groundwater Source Protection Zone in their "What's in my backyard" section<sup>10</sup>. There are Zone I - Inner protection Zones to Zone III - Total Catchment within Sevenoaks study area, see Figure 3.1. The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk, Figure 3.1 shows three main zones (inner, outer and total catchment) and a fourth zone of special interest which may apply to a groundwater source.<sup>11</sup> If a discharge is proposed within a source protection zone then additional information may be required to demonstrate that there is not an unacceptable risk to groundwater and to the surrounding environment. Additional information and advice can be found on the website [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk) and within the document Groundwater protection: Principles and practice (GP3)<sup>12</sup>.



**Figure 3.1 Groundwater Source Protection Zone**

New development should also seek to incorporate SuDS, for example through green roofs and walls, rainwater recycling, permeable paving and soft landscaping to reduce surface water runoff where feasible and appropriate to the size and scale of the development. The hierarchy of surface water disposal is as follows

<sup>11</sup> <http://www.environment-agency.gov.uk/homeandleisure/37833.aspx> - Please note that the fourth zone SPZ4 or 'Zone of Special Interest' was previously defined for some sources. SPZ4 usually represented a surface water catchment which drains into the aquifer feeding the groundwater supply (i.e. catchment draining to a disappearing stream). In the future this zone will be incorporated into one of the other zones, SPZ 1, 2 or 3, whichever is appropriate in the particular case, or become a safeguard zone.

<sup>12</sup> [Environment Agency \(2013\) Groundwater protection: principles and practice \(GP3\)](#)  
2012s6728 - Sevenoaks Stage 1 SWMP (v1.0 Oct 2013)

1. The use of SuDS techniques, appropriate to the location, size and type of development; further details can be found in the SuDS Manual C697 (2007) published by CIRIA.
2. Discharge to watercourse.
3. Discharge to surface water sewer
4. Discharge to combined sewer.

Sevenoaks District Council has adopted policies which seek the inclusion of Sustainable Drainage either through the Code for Sustainable Homes or as a separate requirement. (see Core Strategy policy SP2)<sup>13</sup> The emerging Allocations and Development Management Plan includes policies to integrate Green Infrastructure features into all new development including sustainable drainage systems (see policies EN1 and GI1-GI2)<sup>14</sup>

Sevenoaks District Council has also produced within their Local Development Framework documents', a Green Infrastructure Report which sets out means and locations to consider implementation of green infrastructure within the borough.<sup>15</sup>

Developers should also consider and have regard for the Kent Design Guide<sup>16</sup>. This document includes a technical appendix on 'Water Efficient Homes' which refers to SuDS. Kent County Council is designated the SuDS approving body (SAB). The SAB will have responsibility under the Flood and Water Management Act 2010 for the approval of proposed sustainable drainage systems (SuDS) in new developments and redevelopments. Kent County Council is designated the SuDS approving body (SAB) for Sevenoaks District Council. It should be noted that a clear timetable for implementation of the new responsibilities for SABs is still pending<sup>17</sup>. The duties of the SAB will be to approve drainage systems for new and redeveloped sites before construction can commence. Additionally the SAB will ensure that proposed drainage systems will meet the new National Standards for design, construction, operation and maintenance. The SAB will then be responsible for approving, adopting and maintaining drainage plans and SuDS schemes that meet the National Standards.

<sup>13</sup> Sevenoaks District Council - Sevenoaks Core Strategy Document (adopted February 2011)

<sup>14</sup> Sevenoaks District Council Local Development Framework Allocations and Development Management Plan, Draft Submission February 2013. Please note that at the time of writing this report the Development Management Plan was at DRAFT stage.

<sup>15</sup> Sevenoaks District Council - LDF: Sevenoaks Green Infrastructure Report – March 2010

<sup>16</sup> <https://shareweb.kent.gov.uk/Documents/community-and-living/Regeneration/01foreword.pdf>

<sup>17</sup> **Please note** a clear timetable for implementation of the new responsibilities for SABs is still pending.



## 4 SWMP Action Plan

### 4.1 Introduction

The SWMP has identified a range of recommended actions for the reduction of flood risk across the Sevenoaks SWMP area. The Action Plan collates all information undertaken and collated as part of this SWMP study and:

- Outlines the actions required and where and how they should be undertaken;
- Sets out which partner or stakeholder is responsible for implementing the actions and who will support them;
- Provides indicative costs; and
- Identifies priorities.

### 4.2 Generic Action Plan

Table 4-1 describes the generic actions to be applied throughout all drainage areas (DA01- DA07),

**Table 4-1 Generic Action Plan**

Ref	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)*	Priority (When?)**	Indicative Relative Cost
1	All Drainage Areas	Develop and implement a targeted maintenance schedule.  KCC, Sevenoaks District Council, Upper Medway IDB and Thames Water, Southern Water should develop and implement a targeted maintenance schedule so that the highway gullies, drains and other drainage assets (including SuDS), watercourses and sewers operate effectively to their design capacity.  KCC has maintenance schedules and programmes for gullies. As a priority these should be reviewed in consultation with other partners.	1. Use the Stage 1 SWMP to identify and record where existing drainage infrastructure is, where it drains to and who owns and/or is responsible for maintaining it.  Records of assets should be available to all partners.	KCC	SDC, UMIDB, TW and SW	Quick win	High
			2. Partners to develop a coordinated risk based inspection and maintenance schedule using information in the SWMP (i.e. areas at high risk of flooding, natural flow routes, etc). It should be noted that any change in maintenance regime should be supported by evidence.	KCC	SDC, UMIDB, TW and SW	Medium Term	Medium



Ref	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)*	Priority (When?)**	Indicative Relative Cost
			3. Continue to invest in hydraulic improvements, including de-silting, root removal and minor collapse repair, to reduce the risk of property flooding.	KCC	SDC, UMIDB, TW and SW	Medium Term	Medium
			4. Communicate coordinated maintenance activities to the public to manage expectations.	KCC	SDC, UMIDB, TW and SW	Long Term	Low
2	All Drainage Areas	<p>Raise awareness within the LLFA, partner organisations, developers and the general public regarding the policies for surface water management, specifically SuDS, within existing evidence base documents<sup>18</sup>.</p> <p>Strategic Flood Risk Assessment (2009)</p> <p>Green Infrastructure Reports</p> <p>Adopted Core Strategy</p> <p>Aim to reduce surface water run off within Sevenoaks District Council, as a minimum key partners should seek to maintain the status quo</p>	<p>1. Ensure new developments incorporate SuDS in accordance with the NPPF and the requirements of the SuDS Approving Body (SAB)</p> <p>2. Liaise with key partners regarding opportunities for surface water management, i.e. green infrastructure, where feasible.</p>	KCC, EA SDC, SW, and UMIDB		Quick win	High
			<p>3. Ensure new developments do not increase the risk of surcharge of sewer network within their catchment.</p> <p>4. Stakeholder engagement to inform the public about the benefits of rainwater reuse and recycling.</p>	KCC, EA SDC, SW and TW	UMIDB	Quick win	High
3	All Drainage Areas	Raise awareness within the borough of the problems caused by inappropriate disposal of fuel oils to drains and gullies.	Reduce the inappropriate dumping of Fats Oils and Grease by developing and implementing a campaign to educate the public of the impacts on drainage. In addition, consideration, along with stakeholder engagement as to the whether a collection for of Fats Oil and Grease (FOG) within the relevant authority areas, could reduce the inappropriate disposal of	TW, SW,	EA, UMIDB, KCC & SDC <sup>19</sup>	Quick win	High

<sup>18</sup> [Sevenoaks District Council Planning policy and the Local Development Framework](#)

<sup>19</sup> Traditionally water and utility companies take the lead in providing information regarding the hazards relating to the disposal of Fats Oils and Grease, however a partnership approach should now be considered between all key partners, to enable more effective engagement with the public,

Ref	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)*	Priority (When?) **	Indicative Relative Cost
			FOGs				
4	All Drainage Areas	Raise awareness within the borough of the issue caused by inappropriate land management	Stakeholder engagement to inform the public about appropriate land management in vulnerable areas	KCC, SDC	EA, UMIDB, Parish Councils	Long Term	Low
5	All Drainage Areas	Thames Water and Southern Water should endeavour to inform key partners about their sewer models	Liaise with key partners to determine a method to disseminate information regarding sewer models completed.	TW & SW	EA, KCC & SDC	Long Term	Low
6	All Drainage areas	Regulation 17 of the water environment (Water Framework Directive) (England and Wales) Regulations 2003 requires all public bodies, when exercising their functions so far as affecting a river basin district, to have regard for that district's river basin management plan and to any supplementary plans.	All key partners are to be mindful of their obligations under the Regulation 17 of the water environment (Water Framework Directive) (England and Wales) Regulations 2003 and environmental objectives as specified in the relevant River Basin Management Plans when carrying out locations specific actions.	EA SDC, TW, SW and UMIDB		Long Term	Low

**\*Priority: Quick win = within 12 months. Short Term = up to 2 years. Medium Term = up to 5 years. Long Term = open ended/indefinite.**

### 4.3 Location Specific Action Plan

Table 4-2 describes the action plan for specific locations. Each action has been defined into its particular drainage area and receptor. Through discussion with the key partners specific actions for this stage of the Surface Water Management Plan were defined. It should be noted that a specific action has not been defined for every receptor.

It should be noted; generally where issues have been solely related to KCC Highways, Thames Water or Southern Water these have been noted in a separate record/ addendum and passed to the relevant body to investigate and follow up with an action should it be required. Where KCC Highways, Thames Water or Southern Water issues have been discussed with key partners during the Data Validation and Action Plan Workshop and an action has been decided these have been highlighted below within the Location Specific Action Plan.

**Table 4-2 Location Specific Action Plans**

*DA01 Swanley and Hextable*

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA01	Hextable (A)	Lower Road	<i>Lower Road has been highlighted by historical records as a pathway for surface water flows, the FMfSW also indicate this road as a pathway</i>						
			Consider use of green infrastructure or localised measures (fringe management, kerbing, minor bunding, signage, fringe interception etc) to improve management of surface water during intense rainfall.	Reduce the amount of runoff on carriageways	Include study within future schedule of works	KCC	SDC	Short term	Up to 50k
DA01	Swanley Village (B)	Button Street	<i>Although no property was affected according to historical records, there was severe flooding on this road. FMfSW also indicate this route is a pathway for flow. DBC identified that flooding here is a cross border issue. Much flooding on the bottom of Goss Hill and Clement Street has been noted due to an overflowing KCC Highways Lagoon. KCC Highways explained that a deep bore soakaway has been installed and the Highways Lagoon has been this financial year( 2012)</i>						
			Continue to monitor this area for further problems	Show that schemes completed in 2012 are providing improved drainage.	Include monitoring within future schedule of works	KCC	SDC	Long term	Up to 50k

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
			<i>Ongoing Problem – no properties are recorded as being affected.</i>						
		Swanley Village Road	Investigate the condition of the drains and gullies on Swanley Village Road.	Identification of problem areas	Include study within future schedule of works	KCC, TW	SDC /EA	Short Term	Up to 50k
			Consider installing SuDS or green infrastructure west of Park Lane near the Nursery (FMfSW indicate a pathway here)	Improve surface water management	Include study within future schedule of works	KCC	SDC	Long term	Up to 50k
DA01	Swanley West (C)	Ladds Way and Edward Gardens	<i>FMfSW indicate this as an area of ponding, historic evidence supports this. Options to be considered may include the following</i> Engage stakeholder's on Button Street, such as businesses on the Button Street Business Park and consider installing green infrastructure the junction between Edward Gardens, Ladds Way and Azalea Way, in order to improve management of surface water during intense rainfall.	Alleviate excess surface water on carriageway	Include study within future schedule of works	KCC	SDC	Long term	Up to 50k
DA01	Swanley South (D)	St George's Road	<i>FMfSW indicate this as an area of ponding, historic evidence supports this. Options to be considered may include the following</i> Increase frequency of maintenance of gullies and drains in the area	Improve drainage	Include study within future schedule of works	KCC	SDC	Short term	Up to 50k

DA02 - Horton Kirby and Hartley

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA02	Horton Kirby (A)	Franks Lane	<i>Records show that a 500 yard stretch of the road was closed as the water level was reported to be 2.5 ft deep</i>						
			Investigate the method of surface water drainage on this road, i.e. check records to assess where the surface water is draining to. If drainage is directed to foul sewer consider redirecting all surface water into the River Darent, with the appropriate pollution prevention measures included in the scheme.	Reduce the amount of runoff on carriageways	Include study within future schedule of works	KCC, TW	SDC /EA	Short Term	Up to 50k
DA02	Hartley (B)	Bunkers Hill	<i>Records suggest that this area is prone to flooding. A number of drains have blocked which has resulted in a 3 ft deep pool of water, 20ft long across the carriageway.</i>						
			KCC Highways have confirmed that a deep bore soakaways, additional drainage and a habitat pond are programmed in the next financial year. Once installed the situation should be monitored.	Improved surface water drainage at Bunkers Hill	Study included within 2013 schedule of works	KCC, TW	SDC /EA	Short Term	Up to 50k
		Old Downs	<i>Recurring problem with blocked drains</i>						
			A CCTV study to investigate the condition of drains and gullies.		Include study within future schedule of works	KCC	SDC	Medium term	Up to 50k
		Pease Hill	<i>Historically water levels have reached roughly 2 ft from the front door of a property which is located at the bottom of a hill. There are no drains in the area.</i>						
			Consider installing green infrastructure in partnership with the residents of Pease Hill or localised measures (kerbing, minor bunding, signage etc) to improve management of surface water during intense rainfall.		Include study within future schedule of works	KCC	SDC	Long term	Up to 50k



### DA03 - Sevenoaks Rural North

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA03	Crockenhill (A)	Eynsford Road	<p>Records show that this area floods in sustained wet weather. This location was highlighted as a drainage hotspot; KCC described this area as one that is frequently inundated by surface water flooding. In 2012, KCC was requested to provide a tanker to clear flood water at this location.</p> <p>KCC Highways are planning to install two soakaways and re-route drainage system to suit. (Date unknown)</p>		Works programmed, date unknown	KCC			
DA03	Kemsing (H)	Noahs Ark	<p>This location was highlighted as a drainage hotspot. A culvert was reportedly blocked and needed clearing as the stream was backing up and posed a safety risk to the highway and adjacent properties.</p> <p>Key partners were unaware of any recent incidents so the following action was recommended at the Data Validation and Action Plan Workshop.</p>						
			<p>Monitor the situation and address as and when flooding occurs in the future.</p>	Properties adjacent to Noah s Ark		KCC	SDC	Long Term	Up to 50k

### DA04 - Sevenoaks Town

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA04	Following a review of the historical flooding data and discussing DA02 with key partners at a Data Validation and Action Plan Workshop, there are no Location Specific Actions identified for Sevenoaks Town.								

#### DA05 - Sundridge, Brasted and Westerham

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA05	Following a review of the historical flooding data and discussing DA02 with key partners at a Data Validation and Action Plan Workshop, there are no Location Specific Actions identified for Sundridge, Brasted and Westerham.								

#### DA06 - Sevenoaks Rural South

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA06	Wickhurst (D)	Coppings Road	<p><i>This location was highlighted as a drainage hotspot. EA records describe road and cottages have been flooded; flooding from the Brook was reported to occur once every 1-2 years. After flooding, the gullies were requested to be cleaned to remove any silt/debris. In 2012, KCC was requested to remove flood water, cleanse and jet gullies in the vicinity in order to prevent further flooding.</i></p> <p><i>There is an ongoing issue at this location with poorly maintained ditches.</i></p> <p><b>KCC are currently liaising with landowners to make them aware of their obligations to maintain ditches.</b></p>			KCC Highways	KCC (FRM)		

DA07 - Edenbridge

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA07	Edenbridge (A)	Edenbridge	Edenbridge is vulnerable to flooding from different sources, the River Eden, sewers, surface water (overloaded/ blocked drains and gullies) The following action was discussed and agreed at the Data Validation and Action Plan Workshop.						
			1. Complete a site walkover of Edenbridge.		Include study within future works	KCC	SDC and Parish Council	Short term	Up to 50k
			2. Consider the completion of an Asset Management Strategy in conjunction with the key partners.		Include study within future works	KCC	SDC and Parish /Town Council	Medium term	Up to 50k

\* **Priority: Quick win = within 12 months. Short Term = up to 2 years. Medium Term = up to 5 years. Long Term = open ended/indefinite.**

\*\* **Indicative Cost: Up to 50k, 50-150k, 150-250k or 250+k**

#### 4.4 Review Timeframe and Responsibilities

The project partners have reviewed and commented upon the actions during the Action Plan workshop.

High priority actions identified in the 'Action Plan' are likely to be those addressed first. However, this report can only consider relative priorities *within* Sevenoaks. Some partner organisations, Southern Water, Thames Water, Sevenoaks District Council and Kent County Council have flood risk management responsibilities beyond the geographic scope of this study, and therefore the priority of actions within Sevenoaks will have to be assessed against actions in other areas. Kent County Council is currently embarking upon a number of more strategic-scale SWMPs in a number of other settlements across the county.

Actions leading to capital works will initially require a detailed local study that provides robust estimates of costs and justification (i.e. tangible benefits) of the scheme. If a study demonstrates that a scheme is beneficial funding will need to be obtained before it can be delivered. Applications for funding and the implementation of solutions on the ground, all of the detailed study and availability of funding have the potential to change the findings and recommendations of this report.

It is recommended that an annual review of the High and Medium Priority actions is undertaken. This will allow for forward financial planning in line with external partners and internal budget allocations. Low priority actions should be reviewed on a three-year cycle.

#### 4.5 Sources of funding

Funding for local flood risk management may come from a wide range of sources. In Sevenoaks these may include:

- Defra (Flood Defence Grant in Aid)
- Industrial estate owners and businesses
- Kent County Council (highways)
- Sevenoaks District Council
- IDBs
- Local communities
- Network Rail
- New developments (directly through the developer or through CIL)
- Southern Water
- Thames Water
- Local Levy from the southern region Regional Flood & Coastal Committees (RFCC)

It is likely that not all schemes in Sevenoaks will not have sufficiently strong cost-benefit ratios to attract 100% funding from Defra Flood Defence Grant in Aid (FDGiA), and would therefore require a portfolio of funding to be developed from various sources, including funding sources available for delivering other objectives such as improvements to highways, public open spaces and bio-diversity.

#### 4.6 Ongoing Monitoring

The partnership arrangements established as part of the SWMP process should continue beyond the completion of the SWMP in order to discuss the implementation of the proposed actions, review opportunities for operational efficiency and to review any legislative changes.

The action plan should act as a live document that is updated and amended on a regular basis, and as a minimum this should be as agreed in the Local Flood Risk Management Strategy for Kent, although individual partners may wish to review their actions more regularly.

There may be circumstances which might trigger a review and/or an update of the action plan in the interim, for example:

- Occurrence of a surface water flood event;
- Additional data or modelling becoming available, which may alter the understanding of risk within the study area;
- Outcome of investment decisions by partners is different to the preferred option, which may require a revision to the action plan, and;
- Additional (major) development or other changes in the catchment which may affect the surface water flood risk.

The action plan should act as a live document that is updated and amended on a regular basis, and as a minimum this should be as agreed in the Local Flood Risk Management Strategy for Kent, although individual partners may wish to review their actions more regularly.

## 4.7 Way Forward

Kent County Council has prepared a Local Flood Risk Management Strategy (the Local Strategy), which sets objectives and priorities for the management of local flood risks across the county. The Local Strategy includes an action plan of investigations and works to achieve the objectives and indicates which risk management authority should lead this work. The action plan is updated annually with progress on previous actions and new actions that have been identified. The action plan uses information from studies like this and other sources from across the county to prioritise where further works are needed to help achieve the objectives, this is balanced with the available sources of funding and resources to deliver these actions. The Local Strategy can be found here:

[www.kent.gov.uk/local\\_flood\\_strategy](http://www.kent.gov.uk/local_flood_strategy)

This SWMP and any new information about local flooding in Sevenoaks that comes to light will be used as part of the evidence base when setting the Local Strategy action plan annually. Any actions identified to be delivered from this SWMP will be overseen by the SWMP Partnership.



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