

Maidstone Stage 1 Surface Water Management Plan

FINAL Report

October 2013

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Revision History

Revision Ref / Date Issued	Amendments	Issued to
Draft Report, v1 / September 2013		Max Tant (Kent County Council)
Final Report, v1 / October 2013		Max Tant (Kent County Council)

Contract

This report describes work commissioned by Kent County Council, under commission reference LL048. 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 Maidstone Borough Council, Upper Medway IDB, Southern 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
MBC	Maidstone Borough Council
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.
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 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.
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 risk 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), 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 Maidstone 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. Maidstone has been identified as an area potentially at risk of local flooding in the Preliminary Flood Risk Assessment¹, 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

1.2 Summary of aims and objectives

The main aims and objectives of the Maidstone 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 (where sites are made available)*;
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.

* Note at the time of writing the Stage 1 SWMP the allocations sites were not available².

¹ Kent County Council (2011) Preliminary Flood Risk Assessment available at <http://publications.environment-agency.gov.uk/PDF/FLHO1211BVS1-E-E.pdf>

² [Maidstone Borough Council Local Plan Progress](#)

1.3 Study area

The SWMP study area is the Maidstone borough boundary. Figure 1.1 describes the extent of the study area.

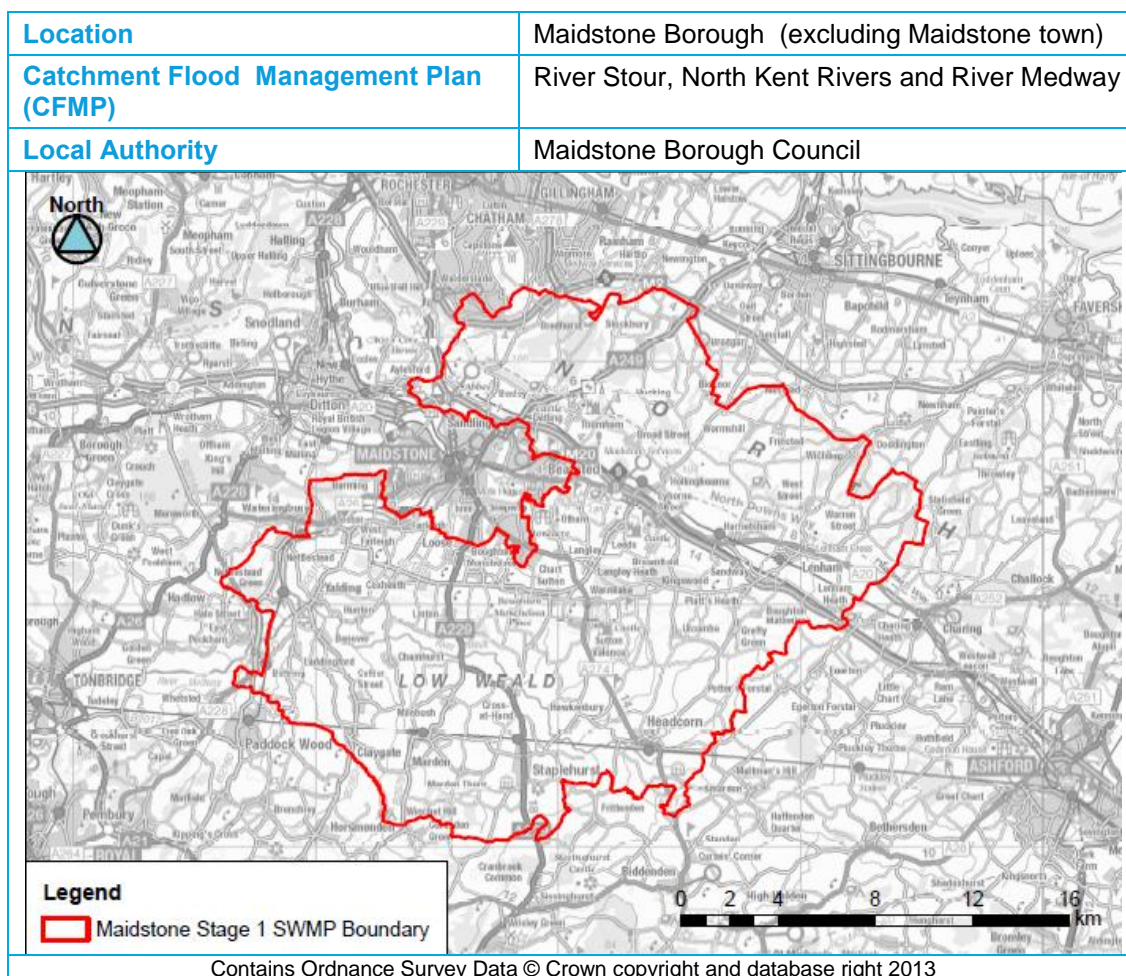


Figure 1.1 Study Area

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.

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

1. River Stour CFMP
2. North Kent Rivers 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'. 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).

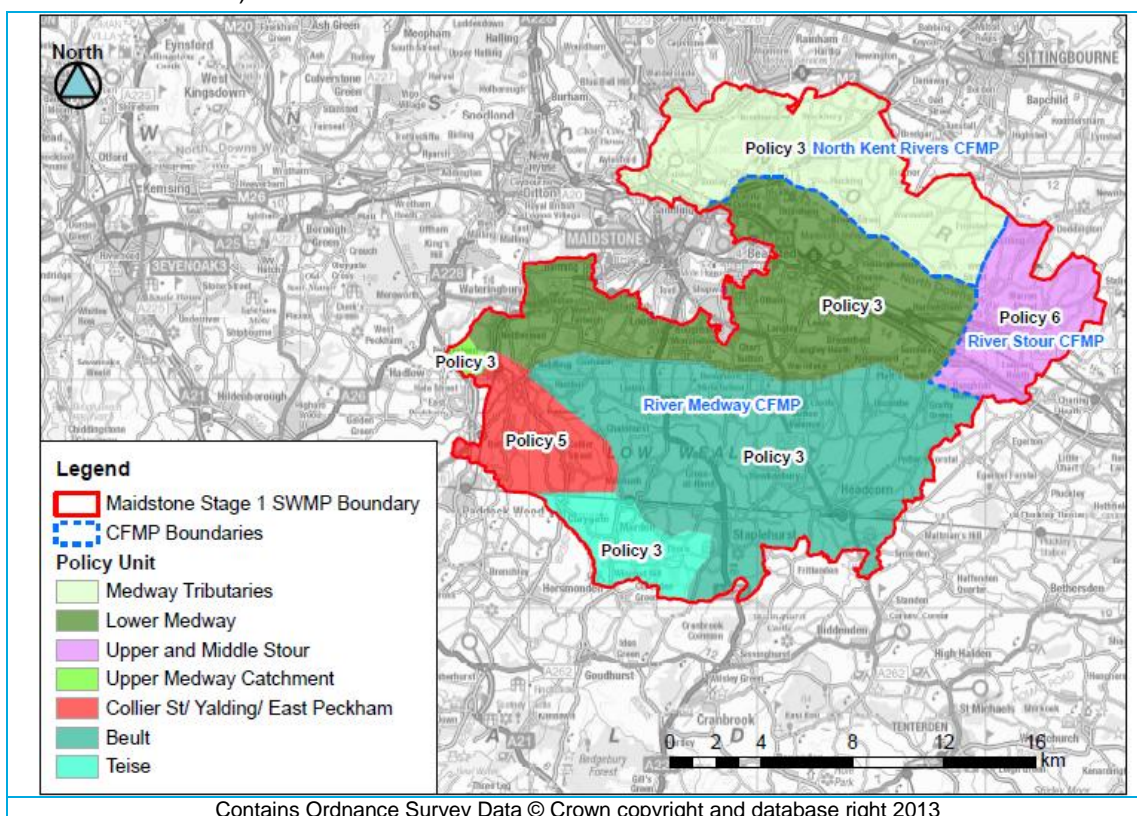


Figure 1.2 CFMP Policy Units and Applicable Policies³

1.3.2 Surface Water

Surface water presents a risk throughout Maidstone. 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 Maidstone. These are:

- Areas Susceptible to Surface Water Flooding (AStSWF) - 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 AStSWF maps and provide a more realistic representation than the AStSWF maps in many circumstances. The Environment Agency considers this to be the national source of information⁴.

³ **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>

⁴ Environment Agency (2012) Flooding from Surface Water - available at <http://www.environment-agency.gov.uk/research/planning/109490.aspx>

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 Maidstone.

Table 1-1 List of Main Rivers

Catchment	Watercourse
Medway	River Beult
	Lesser Teise
	River Medway
	Loose Stream
	River Len
	River Teise
	Coult Stream
Stour	Great Stour

Ordinary Watercourse

Ordinary watercourses are watercourses that are not designated as Main Rivers, and are usually the smaller tributaries of them. KCC, Maidstone Borough Council and Internal Drainage Boards⁵ have permissive powers to carry out works on ordinary watercourses and also have responsibilities in relation to consenting and enforcement. Figure 1.3 illustrates that there is one Internal Drainage Boards within Maidstone:

1. Upper Medway IDB (dealing with upland water and fluvial flooding in the catchment of the River Medway upstream of Allington).

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 Maidstone, specifically in the mid and southern reaches. 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

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' (2012) to find out more information about their responsibilities⁶.

⁵ An Internal Drainage Board's permissive powers pertain to those ordinary watercourses within their boundaries.

⁶ [Environment Agency \(2012\) Living on the Edge](#)

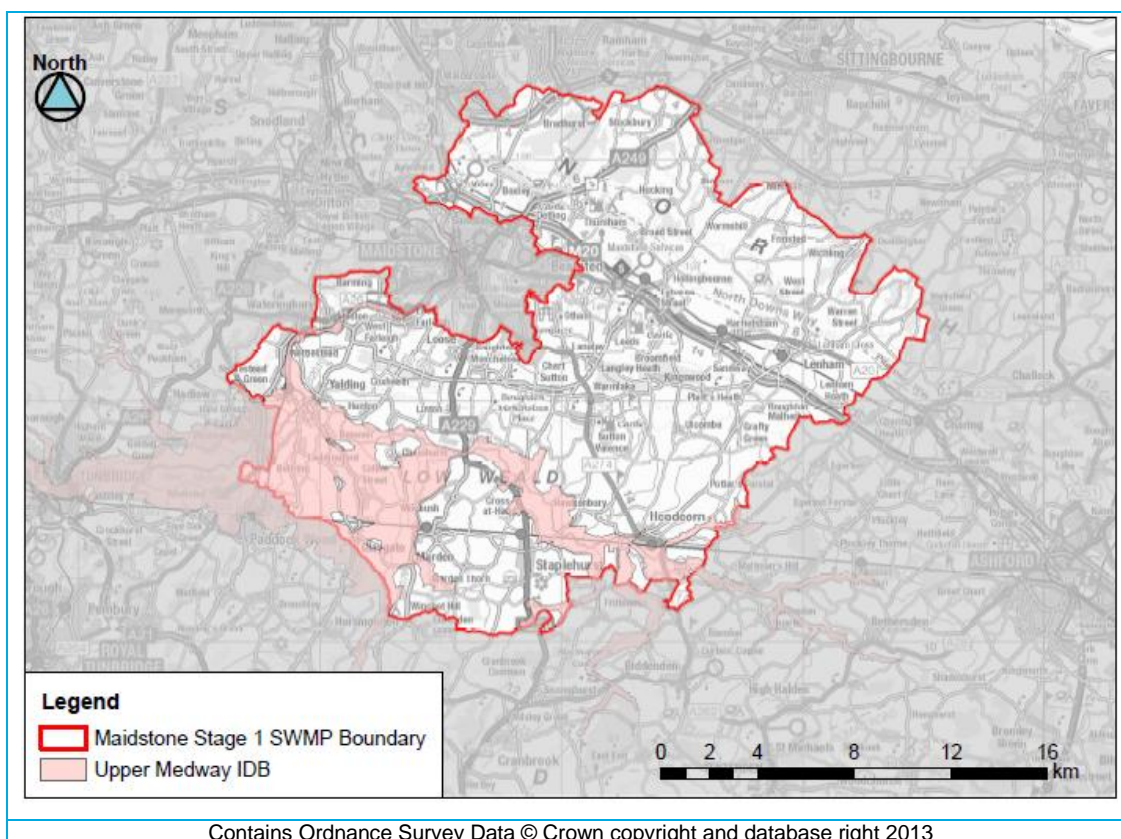


Figure 1.3 Location of IDBs within Maidstone

1.3.4 Sewers

Southern Water is responsible for the sewers in this area. Data provided shows that there are a various sewer types located within the Maidstone SWMP study area, these include:

- Foul
- Surface Water
- Treated effluent

Sewer networks are mostly located in urbanised areas such as Marden, Staplehurst and Headcorn. Foul sewers are the predominant sewer type, with some surface water sewers located in Loose, Yalding, Marden, Staplehurst and Headcorn.

There are sewer models available from Southern Water for Maidstone borough. The location data was requested but it was not available at the time of writing this report.

1.4 Using this report

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

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 Maidstone.
4. SWMP Action Plan	Provides details of the generic and location specific Action Plan and potential funding opportunities.

Section	Description of contents
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"> - Receptor - Date (Month/ Year) - of the flood event, if provided - Location (Area/Road/ Street etc) - Source - perceived source of flooding - No. of properties affected - Source supplied data (organisation) - Source supplied data (report) - Comments - any additional comments provided within the data or through discussion at workshops.
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. This Addendum is to be included within the report at the discretion of KCC.
Addendum 2	Southern Water Issues - A table of historic records that require further investigation from Southern Water. This Addendum is to be included within the report at the discretion of KCC and Southern Water.

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 Maidstone borough. 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 Maidstone borough 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:

- Maidstone Borough Council
- Kent County Council
- Kent County Council - Highways
- Upper Medway IDB
- Environment Agency
- Southern Water

The Stage 1 SWMP was undertaken to determine whether there are any local flood risks within Maidstone borough 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 Maidstone.
- Records of historic flooding from KCC, KCC Highways, MBC, IDB's and Southern Water (were used to identify areas where actions are required within Maidstone). 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 within Maidstone borough.
- 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 Maidstone Level 2 SFRA (2008)⁷, Maidstone Local Multi Agency Flood Plan 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 1927 (Tidal Medway) 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

The Environment Agency has provided data of historic events, from the Medway the Teise the Lesser Teise and the River Beult (Main Rivers). Flooding has been recorded from these rivers on a number of occasions, notably in 1927, 1960, 1963, 1968, 1969 and 2000.

Key Partners explained that Collier Street and Yalding are particularly vulnerable to flooding as they are situated at the confluence of the Medway, the River Beult, River Teise and the Lesser Teise (Main Rivers). Haviker Street, Collier Street, in particular, has been described as area prone to flooding from Main Rivers. Residents built flood walls around their properties to prevent the ingress of flood waters⁸.

Records of flooding on ordinary watercourses have been provided by KCC Highways, the Environment Agency and UMIDB. Common factors described in these records report the perceived causes of flooding to be attributed to one or all of the following:

- Poor maintenance of watercourses
- Blocked infrastructure, such as culverts
- Insufficient channel capacity
- High water levels in watercourses impeding the discharge of flows from their associated tributaries.

Headcorn is an example of an area where records describe all of the above as contributing factors to flooding in the past. It should be noted that within the data provided by key partners, possible knock on effects to sewer networks was evident. There have been reports of repeated fluvial/ sewer events at Clappers Lane, Clappers Farm. Forstal Road backs onto the River Medway (Main River), which at this point is partly tidal. The Environment Agency explained that previous events may have been exacerbated by tide locking of outfalls preventing drains and gullies from discharging to the River Medway (Main River).

Surface Water

The historical records are dispersed throughout the borough. 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. A number of surface water records were also extracted from the Maidstone SFRA, specifically for Harrietsham, Lenham, Marden, Headcorn and Staplehurst.

⁷ Maidstone Borough Council Level 2 Strategy Flood Risk Assessment (2008) available at http://www.maidstone.gov.uk/pdf/090407_Strategic%20Flood%20Risk%20Assessment%20-%20amend%20mbc%20addr.pdf.

⁸ Meeting minutes Upper Medway IDB – data gathering (22/01/2013)
2012s6729 - Maidstone Stage 1 SWMP FINAL (v1.0 October 2013).doc

For the most part surface water flooding could be 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.

Repeated incidents were highlighted within Harrietsham on Ashford Road, KCC Highways report shows that the gullies here need regular cleansing; otherwise, the whole carriageway floods.

Reports describe Marden as experiencing flooding in the past. The perceived causes recorded included poor drainage, blocked drains and local topography. Staplehurst and Headcorn have regular incidents of flooding due to inefficient drainage systems during heavy rainfall or as a result of blockages in the drainage system. The main receptors are described in the MBC SFRA as being residential areas and highways.

Sewer

Southern Water provided records of historical flooding within Maidstone Borough from 2008 - 2012. 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. Sewer flooding records were also extracted from the Maidstone SFRA.

In general, records highlighted that in locations where there were fluvial events, these also have coincides with hydraulic overload. In 2009, sewer flooding at Clapper Lane and Clappers Farm coincided with a fluvial event. The curtilage of three properties was affected.

Maidstone SFRA describes sewer flooding events in Lenham, Marden, Headcorn and Staplehurst; property was recorded as being affected.

Southern Water recorded recent events in 2012, on Moat Road, Headcorn, where the curtilage of five properties was described as flooded, internal flooding was not reported. This is potentially where a combination of sources may exacerbate sewer flooding.

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 has been made aware of any specific locations where historic records indicate that a combination of sources may affect sewer flooding.

Other

KCC Highways records describe that Water Lane, Harrietsham, was affected by a local spring. 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.

There was also a record of burst water mains causing issues in Harrietsham and on King's Road, Headcorn.

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.

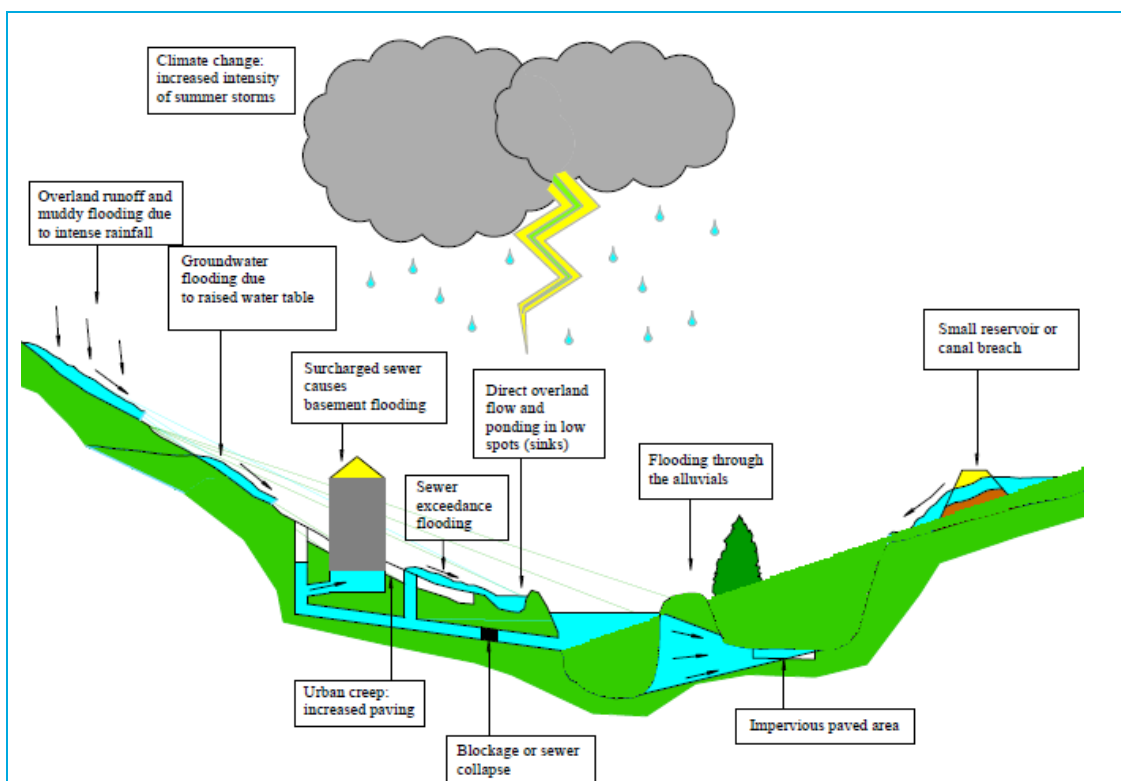


Figure 2.1 Source-Pathway-Receptor

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
- Groundwater⁹

The pathways for flooding are the sewer networks, drains and gullies, highways/ roads and river networks within Maidstone borough. 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 Maidstone 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.

⁹ 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.

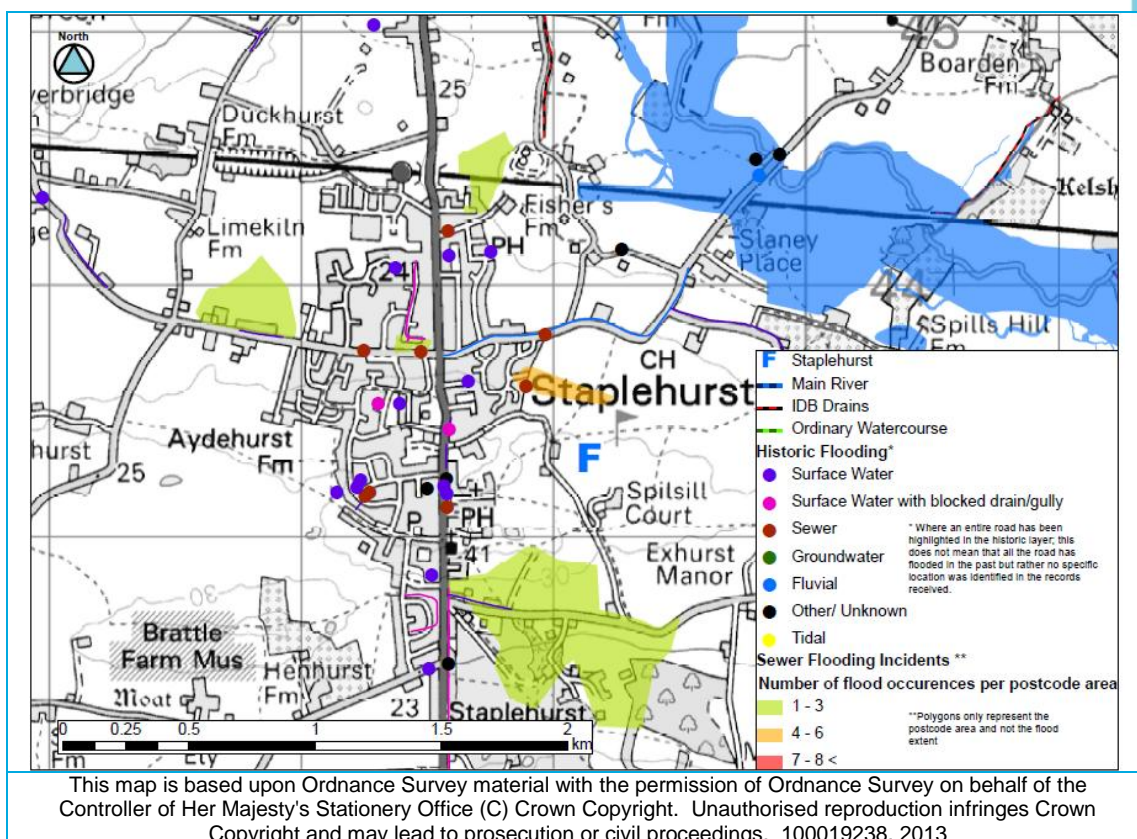


Figure 2.2 Example of a Maidstone SWMP Receptor

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), Maidstone borough 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 Maidstone Drainage Areas

Drainage Area	Location
DA01	Maidstone Rural North
DA02	Maidstone Rural Mid
DA03	Maidstone Rural West
DA04	Maidstone Rural East

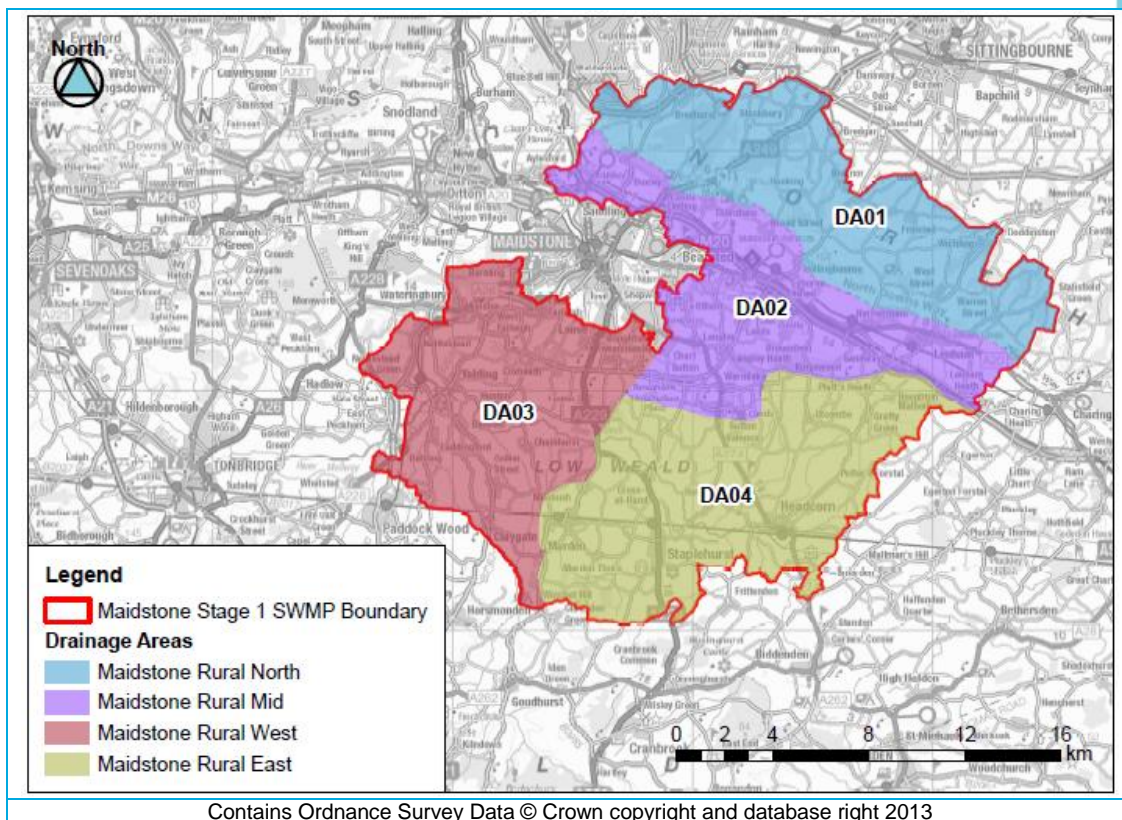


Figure 2.3 Maidstone Drainage Areas

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 Maidstone borough.

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
- Any additional comments provided within the historic datasets.

3 Sustainable Drainage Systems

3.1.1 Feasibility of SuDS in Maidstone

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" section¹⁰. Zone I - Inner protection Zones, Zone II - Outer Protection Zones and Zone III Total Catchment are within the Maidstone 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).¹¹ 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 and within the document Groundwater protection: Principles and practice (GP3)¹².

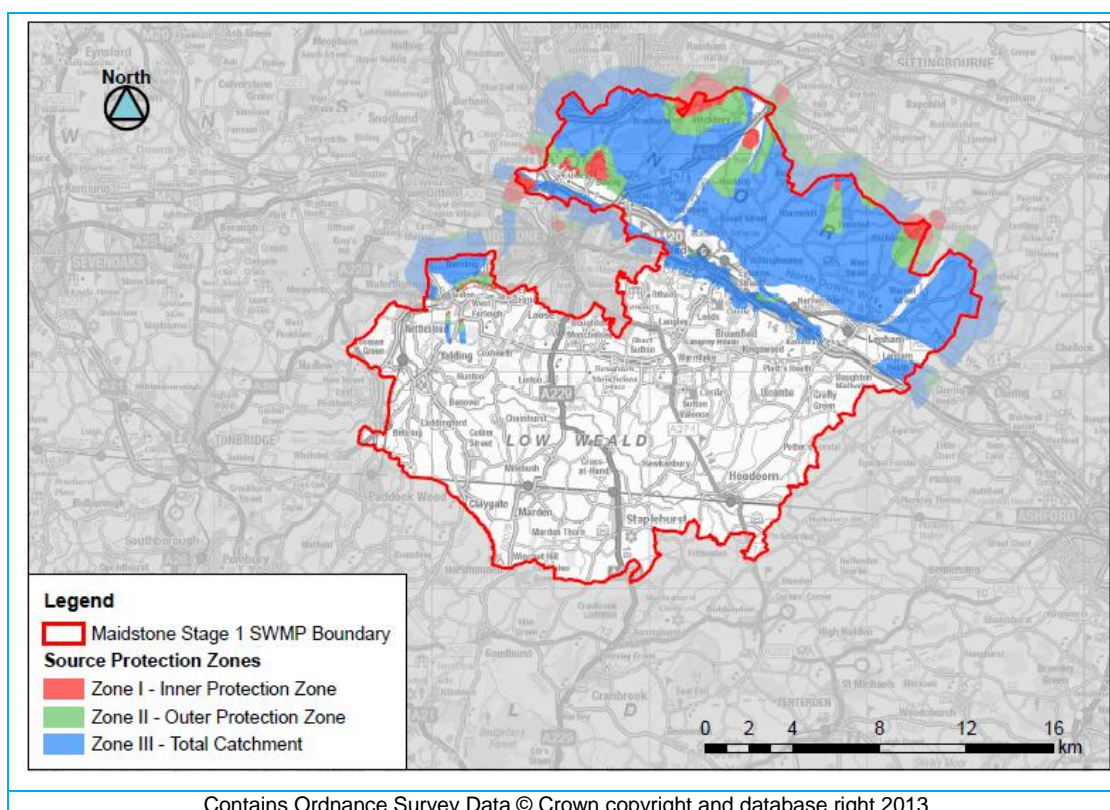


Figure 3.1 Groundwater Source Protection Zone

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

¹¹ <http://www.environment-agency.gov.uk/homeandleisure/37833.aspx>

¹² Environment Agency (2013) Groundwater protection: principles and practice (GP3)
2012s6729 - Maidstone Stage 1 SWMP FINAL (v1.0 October 2013).doc

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.

SuDS Developers should consider and have regard for the Kent Design Guide¹³. This document includes a technical appendix on 'Water Efficient Homes' which refers to SuDS. The establishment of a SuDS Approving Body (SAB) is to be set up in county, borough or unitary local authorities. Kent County Council is designated the SuDS approving body (SAB) for Maidstone Borough Council. It should be noted that a clear timetable for implementation of the new responsibilities for SABs is still pending¹⁴. 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.

¹³ [The Kent Design Guide](#)

¹⁴ **Please note** a clear timetable for implementation of the new responsibilities for SABs is still pending.
<https://www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-change>
2012s6729 - Maidstone Stage 1 SWMP FINAL (v1.0 October 2013).doc

4 SWMP Action Plan

4.1 Introduction

The SWMP has identified a range of recommended actions for the reduction of flood risk across the Maidstone 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- DA04).

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.	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	EA MBC, SW and UMIDB	Quick win	High
		KCC, MBC, EA, Upper Medway IDB and 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.	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	EA MBC, SW and UMIDB	Medium Term	Medium
		KCC has maintenance schedules and programmes for gullies. As a priority these should be reviewed in consultation with other partners.	3. Continue to invest in hydraulic improvements, including de-silting, root removal and minor collapse repair, to reduce the risk of property flooding.	KCC	EA MBC, SW and UMIDB	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
			4. Communicate coordinated maintenance activities to the public to manage expectations.	KCC	EA MBC, SW and UMIDB	Medium Term	Low
2	All Drainage Areas	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 ¹⁵ . Maidstone Level 2 SFRA (2008) Maidstone Borough - Local Plan and supporting documents ¹⁶ Environment Agency Flood Risk Standing Advice ¹⁷	1. Key partners to ensure new developments incorporate SuDS in accordance with the NPPF and the requirements of the SuDS Approving Body (SAB) 2. Key partners to liaise with one another regarding opportunities for surface water management, i.e. green infrastructure, where feasible.	EA MBC, SW and UMIDB		Quick win	High
			3. Key partners who play a part in the planning process for Maidstone Borough Council are to ensure new developments do not increase the risk surcharging of sewer networks within their catchment. 4. Key partners should consider stakeholder engagement to inform the public about the benefits of rainwater and recycling and the consequences of connecting illegally to sewer networks.	EA MBC SW and UMIDB		Quick win	High
3.	All Drainage Areas	Improve the understanding within Maidstone Borough and key partners of the natural and manmade drainage systems.	Develop and implement a strategy for effective land and drainage management in co-operation with key partners, for example, where IDBs can help/ co- ordinate management of watercourses/ drains with the EA/ KCC Highways.	KCC, EA, UMIDB &	MBC	Long Term	Medium
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, MBC EA	, UMIDB, Parish Councils	Long Term	High

¹⁵ [Maidstone Borough Council Local Plan](#)

¹⁶ <http://www.maidstone.gov.uk/residents/planning/local-plan>

¹⁷ <http://www.environment-agency.gov.uk/research/planning/93498.aspx>

Ref	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)*	Priority (When?)**	Indicative Relative Cost
5.	All Drainage Areas	Raise awareness within Maidstone Borough of the rights and responsibilities of a 'riparian owner'.	Stakeholder engagement to inform the public about 'riparian owner' rights and responsibilities.	KCC, MBC EA, UMIDB	, Parish Councils	Long Term	High
6.	All Drainage Areas	Consider Critical Ordinary Watercourse that may benefit from demaining and / or assigning responsibility to the IDBs.	Liaise with key partners to consider which watercourse would benefit from IDB maintenance. It should be noted that any change in maintenance regime should be supported by evidence.	EA, UMIDB,	KCC, MBC	Medium Term	Medium
7.	All Drainage Areas	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.	SW, KCC	EA	Long Term	Low
8.	All Drainage Areas	Raise awareness within the borough regarding catchment sensitive farming and its benefits to minimise soil erosion and diffuse pollution.	Liaise with all key partners about best methods to share information regarding sensitive farming and its benefits.	KCC, EA	UMIDB, MBC	Long Term	Low
9	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 to 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 MBC 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 either KCC Highways 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 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 Maidstone Rural North

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA01	Waterditch Lane	Waterditch Lane	<i>This location was highlighted as a drainage hotspot, KCC are aware of the flooding issues at this location; however, at this stage they are not sure as to what type of scheme is to be implemented.</i> A scheme is planned for 2013/2014.		Work has been included into schedule for 2013/2014	KCC			

DA02 Maidstone Rural Mid

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
		Forstal Road	<i>In 2009 (February and November), Forstal Road was flooded. In November 2009, records describe the perceived cause was a blocked culvert of an ordinary watercourse. EA records also suggest commercial properties have been flooded in the past.</i>						
			Monitor the situation and should future flooding occur action should be taken.		Include study within future schedule of works	KCC, SW, MBC	EA	Long Term	Up to £50k
DA02	Detling (B)	Water Lane	<i>In 2012, KCC Highways were asked to provide a combo to remove flood water and cleanse gullies. Anecdotal evidence suggests that recent resurfacing works covered and damaged the drainage system. KCC Highways are aware of issues here but are unsure what the scheme may be, however, work has been programmed in for 2013-2014.</i>						
			Undertake study / investigation to resolve recurring flooding issues.	Improve conditions along Water Lane	Work programmed for 2013-2014	KCC	n/a	Short term	Up to £50k

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA02	Eythorne Street and Hollingbourne (C)	Eythorne Street, Hollingbourne	<i>MBC explained that there is a small ditch that flows through Eythorne Street which has caused issues in the past, especially to the highway. In 2008, flooding was recorded at this location. The EA explained that the channels here are spring fed and are prone to blockage and require maintenance.</i>						
			Communicate with the landowners and inform them of their riparian duties.		Include study within future schedule of works	KCC, and MBC	SW, EA	Long Term	Up to £50k
			Monitor the situation and should future flooding occur; action/ enforcement should be taken.		Include study within future schedule of works	KCC, SW, EA, MBC		Long Term	Up to £50k
DA02	Harrietsham (D)	Harrietsham	<i>The EA described watercourses are being spring fed and easily blocked (undersized culverts). A number of events were reported in the historical flood data relating to the following areas of Harrietsham;</i> <ul style="list-style-type: none"> - Church Road - East Street - Rectory Lane - Fairbourne Lane - Goddington Lane - Holm Mill Lane - Lakelands 						
			Complete an integrated asset management survey of the culverts, bridges and soakaways in Harrietsham to determine the condition of the infrastructure in the area.	Identify the origin/s of the issues	Engage with relevant key partners to organise date and include within future schedule of works	KCC, MBC,	SW, Parish Council, EA	Medium Term	Up to £50k

DA03 Maidstone Rural West

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA03	Nettlestead Green (D)	Hampstead Lane	<i>Repeated records of localised flooding at this location. The EA suggested at the Data and Validation workshop that a flap valve be fitted where the drain meets the River Medway to help to alleviate localised flooding</i>						
			Complete an investigation to consider this measure and its potential benefits		Include study within future schedule of works	KCC,	SW, MBC EA	Long Term	Up to £50k

DA04 Maidstone Rural East

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA04	Marden (D)	Marden	<i>Numerous issues identified within Marden from varying sources</i>						
			Consider completing a integrated catchment model for Marden		Include study within future schedule of works	KCC	EA, SW, MBC	Short Term	Up to £50k
DA04	Marden (D)	Pattenden	<i>This location was highlighted as a drainage hotspot. Sewer flooding was recorded in 2008. EA described this road suffers from surface water flooding due to surface water being unable to discharge to the watercourse and the presence of hard standing. EA described traffic on the road can create a bow wave during an event which increases flood risk to properties.</i>						
			<i>In 2012, KCC were requested to clear flood water and cleanse and jet gullies to prevent further flooding.</i> Investigate the methods of surface water drainage and consider routing drainage into existing watercourse in the future		Include study within future schedule of works	KCC	, SW, MBC	Long Term	Up to £50k

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA04	Clapper Farm (E)	Clapper Lane	<i>Records of flooding from numerous sources, Sewer flooding in 2009 affecting the curtilage of three properties. Fluvial flooding from an unnamed drain and an IDB Drain.</i> <i>MBC included this area within their "Planned Maintenance Schedule"</i>						
			Consider completing an investigation in collaboration with key partners into the methods of drainage at Clappers Lane.		Include study within future works	KCC, UMIDB, MBC, , SW		Short Term	Up to £50k
DA04	Staplehurst (F)	Staplehurst	<i>Numerous issues identified within Staplehurst from varying sources</i>						
			Consider completing an integrated catchment model for Staplehurst.		Include study within future schedule of works	KCC	EA, SW, UMIDB, MBC	Short Term	Up to £50k
			Consider a partnership approach with EA and IDB to continue to maintain watercourse and assets in the area. It should be noted that any change in maintenance regime should be supported by evidence.			EA UMIDB	KCC, SW	Medium Term	Up to £50k
DA04	Headcorn (G)	Headcorn	<i>Key partners have identified that there are issues as a result of unmaintained drains and channels with insufficient capacity. There have also been repeated incidents of sewer flooding. There are a number of records of surface water flooding from overloaded drains and gullies and from blockages. Therefore the following action should be considered.</i>						

DA	Area of benefit	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
			Consider completing an integrated catchment model for Headcorn.		Include study within future schedule of works	KCC,	EA, SW, UMIDB, MBC	Short 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* Maidstone. Some partner organisations, Southern Water, Environment Agency and Kent County Council have flood risk management responsibilities beyond the geographic scope of this study, and therefore the priority of actions within Maidstone 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 Maidstone these may include:

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

It is likely that not all schemes in Maidstone 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

This SWMP and any new information about local flooding in Maidstone borough 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.