



Thanet Stage 1 Surface Water Management Plan

FINAL Report

May 2013

Kent County Council County Hall MAIDSTONE Kent ME14 1XQ







JBA Project Manager

Rachel Huitson-Little MSc CEnv MCIWEM C.WEM Aberdeen House South Road HAYWARDS HEATH West Sussex UNITED KINGDOM RH16 4NG

Revision History

Revision Ref / Date Issued	Amendments	Issued to
October 2012, v1		Max Tant
November 2012, v2	Generic SUDs section moved from Chapter 3 into an appendix. Recommendations for further detailed SWMPs moved from location specific action plan to generic action plan. Amend DA02 Thanet Urban to DA02 Birchington and Margate.	Max Tant

Contract

This report describes work commissioned by Kent County Council, by an email 20th January 2012. 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.

Prepared by	Margaret Moran LLM BSc Dip		
	Analyst		
Reviewed by	Rachel Huitson-Little MSc CEnv MCIWEM C.WEM		
	Principal Analyst		
	Marc Pinnell BSc MSc MCIWEM C.WEM		
	Director		

Purpose

This document has been prepared as a draft report for Kent County Council. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Kent County Council for the purposes for which it was originally commissioned and prepared.

JBA Consulting has no liability regarding the use of this report except to Kent County Council.





Acknowledgements

We would like to acknowledge and thank Thanet District Council, Southern Water, River Stour (Kent) IDB and Kent County Council for all their assistance during this project.

Copyright

© Jeremy Benn Associates Limited 2013

Carbon Footprint



A printed copy of the main text in this document will result in a carbon footprint of 206g if 100% post-consumer recycled paper is used and 262g if primary-source paper is used. These figures assume the report is printed in black and white on A4 paper and in duplex.

JBA is aiming to achieve carbon neutrality.





Contents

1	Introduction	1
1.1 1.2 1.3 1.4	What is a Surface Water Management Plan Summary of aims and objectives Study area Using this report	1 1 2 4
2	Preparation	5
2.1 2.2 2.3 2.4 2.5	Partnership Approach Data Collation and Review Historical flooding Source Pathway Receptor Communicating and mapping the risk	5 5 6 8
3	Sustainable Drainage Systems	10
3.1	Feasibility of SUDS in Thanet	10
4	SWMP Action Plan	12
4 4.1 4.2 4.3 4.4 4.5 4.6	SWMP Action Plan Introduction Generic Action Plan Location Specific Action Plan Review Timeframe and Responsibilities. Sources of funding Ongoing Monitoring	12 12 14 17 17
4 4.1 4.2 4.3 4.4 4.5 4.6 Append	SWMP Action Plan Introduction Generic Action Plan Location Specific Action Plan Review Timeframe and Responsibilities Sources of funding Ongoing Monitoring	12 12 14 17 17
4 4.1 4.2 4.3 4.4 4.5 4.6 Append A	SWMP Action Plan Introduction Generic Action Plan Location Specific Action Plan Review Timeframe and Responsibilities Sources of funding Ongoing Monitoring dices Data Review	12 12 14 17 17
4 4.1 4.2 4.3 4.4 4.5 4.6 Append A B	SWMP Action Plan Introduction Generic Action Plan Location Specific Action Plan Review Timeframe and Responsibilities. Sources of funding. Ongoing Monitoring dices Data Review. Detailed Summary Sheets and Mapping	12 12 14 17 17
4 4.1 4.2 4.3 4.4 4.5 4.6 Append A B C	SWMP Action Plan Introduction Generic Action Plan Location Specific Action Plan Review Timeframe and Responsibilities Sources of funding Ongoing Monitoring dices Data Review Detailed Summary Sheets and Mapping Flood History Table	12 12 14 17 17





List of Figures

Figure 1.1 Thanet SWMP Study Area	2
Figure 2.1 Source-Pathway-Receptor	7
Figure 2.2 Example of a Thanet SWMP Receptor	8
Figure 2.3 Thanet Drainage Areas	9
Figure 3.1 Groundwater Source Protection Zone	11

List of Tables

Table 1-1 Report layout	4
Table 2-1 Drainage Areas	8
Table 4-1 Generic Action Plan	12
Table 4-2 Location Specific Action Plan	14



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
CIRIA	management of flood risk.
	Construction industry Research and information Association
	Diainage Area
	Are defined for the purposes of this study using EMfSW (1 in 200 year (doop))
Dialitage Alea	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	Part of the UK Government's response to Sir Michael Pitt's Report on the
Management Act	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
	Flood Map for Surface Water
	Internal Drainage Board
JPY	Kent Council
	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.
PERA	The area at risk from reaciving flood water
Piek	In flood risk management, risk is defined as a product of the probability or
Nor	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
SERA	Strategic Flood Rick 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
Stakenolder	A person or organisation affected by the problem or solution, or interested in the
	and communities





Term	Definition
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.
TDC	Thanet District Council



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 a partnership of flood risk management authorities who have responsibilities for aspects of local flooding, including the County Council, Local Authority, Sewerage Undertaker and other relevant authorities.

The purpose of a SWMP is to identify what the local flood risk issues are, their effects 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 Thanet as part of their new remit for strategic oversight of local flood risk management in Kent, conferred on them by the Flood and Water Management Act 2010. Thanet 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 new role and other SWMPs they are undertaking please visits their website:

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

1.2 Summary of aims and objectives

The main aims and objectives of the Thanet 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 suitability of SUDS in the area and the techniques that are appropriate, identifying regional variations where necessary;
- 10. The identification of any easy win opportunities that are apparent without further work, which may include planning policies or simple flood defence measures; and
- 11. A plan for further work that may be necessary to manage or better understand the risks identified, including the owner of the actions, the timeframe for undertaking them and indicative costs.

¹ Kent County Council (2011) Preliminary Flood Risk Assessment available at http://publications.environment-agency.gov.uk/PDF/FLHO1211BVSI-E-E.pdf Thanet SWMP Stage 1 Report.doc





1.3 Study area

The SWMP study area, Thanet, is located in the north eastern tip of Kent and is part of the River Stour Catchment.

Figure 1.1 describes the extent of the study area. Canterbury city is to the west and Dover District is to the south. The land use in Thanet is predominantly arable land, with Margate, Broadstairs and Ramsgate being the main areas of urbanisation. It is a coastal area with the sea providing the northern and eastern boundary. The Lower Stour and River Wantsum mark the southern and western boundaries.



Figure 1.1 Thanet SWMP Study Area

1.3.1 CFMP

Thanet District falls within the Stour Catchment, and is covered by the River Stour CFMP. The CFMP describes Isle of Thanet as a Policy Option 1; an area of little or no significant fluvial flood risk which requires monitoring. Land around the Lower Stour is described as Policy Option 6 – areas of low to moderate flood risk where action may be possible to store water or manage run-off in specific locations that provide overall flood risk reduction or environmental benefits (only after detailed assessment and consultation).

1.3.2 Surface Water

Surface water presents a risk throughout Thanet District. 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 system (surface water sewer, Kent CC Highways drains and gullies, and open channels or ordinary watercourses).

There are two sources of information available from the Environment Agency, relating to the identification of potential surface water flood risk in Thanet. 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 information².

For the purposes of this report we will be using the FMfSW datasets.

1.3.3 **Watercourses**

Main River

It should be noted that there are no Main Rivers within the SWMP study boundary, aside from the Lower Stour, River Wantsum and Minster Stream. The general topography of the Lower Great Stour is low lying and generally prone to flooding.

The Environment Agency has powers to maintain and improve main rivers and powers to manage flood risk from main rivers and the sea.

Ordinary Watercourse

Ordinary watercourses are watercourses that are not main rivers. The flooding from ordinary watercourses is often smaller in nature than flooding from Main Rivers and tends to be localised. Local authorities and internal drainage boards have powers to manage flood risk from ordinary watercourses, surface water and groundwater.

The River Stour (Kent) IDB covers areas within the boundary of Thanet District. The IDB covers an area with a high concentration of ordinary watercourses where drainage is complex and one severe rainfall event can cause flooding on a number of ordinary watercourses simultaneously.

1.3.4 **Sewers**

Southern Water is responsible for the sewers in this area. Data provided shows that there are various sewer networks located in Thanet:

- Combined
- Foul
- Treated effluent •
- Surface Water

From Birchington to Margate in the east sewers are predominantly foul. Broadstairs to Ramsgate the sewers are mostly combined sewer systems.

Southern Water has also confirmed that they have network models in the following areas:

- Margate (MARG) (covers Margate and north area)
- Broadstairs (BROA) (covers Broadstairs and northeast area) •
- Weatherless (WEAT) (covers Ramsgate)
- Minster (MINS)

Margate and Broadstairs are currently separate models although the Broadstairs catchment now pumps to the terminal PS at Margate which then pumps to the Weatherlees Hill B treatment works. For any analysis of this terminal PS and overflow, then the models would need to be combined.

Weatherlees is a more detailed model than the other three models as it was re-built relatively recently, circa 2005/06, whereas the others are likely to have been built sometime in the 90's.

The models will be pre-dominantly of the foul/combined public sewerage system although may incorporate a few public surface water sewers where CSO's discharge.

² Environment Agency (2012) Flooding from Surface Water - available at http://www.environmentagency.gov.uk/research/planning/109490.aspx Thanet SWMP Stage 1 Report.doc



1.4 Using this report

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

Table 1-1 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 Thanet.
4. SWMP Action Plan	Provides details of the generic and location specific Action Plan and potential funding opportunities.



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 the Thanet district. Many organisations have rights and responsibilities for local flood risk management. 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 surface water flood risk across the Thanet 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 flooding. The key partners involved in this project are:

- Kent County Council
- Kent County Council Highways
- Thanet District Council
- Environment Agency
- Southern Water
- River Stour (Kent) Internal Drainage Board (IDB)

The Stage 1 SWMP was undertaken to determine whether there are any local flood risks within the Thanet 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:

- Inception meeting
- Data gathering exercise
- Action plan workshop

2.2 Data Collation and Review

Data has been collected from the key partners and the quality if the data has been assessed and uncertainty or perceived weakness has been 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 Thanet.
- Records of historic flooding from Thanet District Council (TDC), Southern Water and Kent County Council and Highways were used to identify areas where actions are required within TDC. It should be noted that many of the historic records, specifically from highways only went back as far as 2008.
- Groundwater vulnerability zones and groundwater source protection zones were informative when determining the applicability of SUDS within Thanet.
- National Receptor Datasets (NRD) were used and found to be informative when quantifying risk and prioritisation potential measures and actions (Section 4). The NRD was not used to determine numbers potentially affected by the floods rather to indicate the critical infrastructure that may be impacted by surface water flooding.





• Other data utilised included the Thanet SFRA³ and Environment Agency Flood Zone⁴.

2.3 Historical flooding

Each Risk Management Authority (RMA) provided data on incidents of historical flooding collected. The records begin in 1953 to the present; there are a number of records that do not have a date specified. A Flood History Table has been compiled providing further details on each recorded event received from all RMAs, and is documented within Appendix C. A short précis is noted below.

Fluvial

The Lower Stour channel capacity was exceeded and flooding occurred in 2000 and 2001.

There are issues surrounding the Tivoli Brook, and there has been evidence of flooding and water quality issues. Tivoli Brook was originally mapped as a surface water sewer. This watercourse has now been reclassified as a "watercourse of disputed responsibility". This is a long standing issue between all key partners.

Coastal

The most notable surge event to occur along the North Kent coastline happened on 31 January 1953, when a massive storm surge coincided closely with the time of a high spring tide. The result of this was one of the worst natural disasters in Northern Europe in the last two centuries, leading locally to flooding. Another notable event occurred in January 1978. Whilst this event was not too dissimilar to 1953 in terms of surge magnitude, the impact of the event was much reduced due to the construction of sea defences along the North Kent coastline following the 1953 event.

Surface Water

The historical records provided were mainly from Kent County Council Highways, anecdotal records of depths and sources of flooding on highways were described. 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.

Sewer

Southern Water provided 25 records of flooding based on postcode polygons, and within these records indication was given as to whether this flooding was internal, within the curtilage of a property or external.

Northdown Road, Margate had the most recorded incidents of flooding, six properties were recorded as being affected; four within their curtilage and with two properties internally flooding.

The sewer network within Ramsgate is predominantly directed towards Ramsgate Harbour, causing pressure on the system and has resulted incidents in the past

As mentioned above there is an issue at Ramsgate Harbour of foul sewerage surcharge.

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, focussing on receptors that are at risk and describing the source of the flooding and pathway by which it floods the receptor. A simple schematic of many of the potential sources, pathways and receptors is illustrated in Figure 2.1.

⁴ Environment Agency Flood Maps available at www.environment-agency.gov.uk/homeandleisure/37837.aspx Thanet SWMP Stage 1 Report.doc

³ Thanet District Council (2009) Thanet District Strategic Flood Risk Assessment available at

http://www.thanet.gov.uk/pdf/C016i2%20Thanet%20District%20SFRA%20Volume%201.pdf





Figure 2.1 Source-Pathway-Receptor

The main sources of flooding in the study catchment are summarised below:

- Heavy rainfall
- Rivers overtopping of river banks
- Coastal breach/ overtopping of coastal defences

The pathway of flood risk is the sewer network, drains and gullies and river networks within Thanet. 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 Thanet 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, Acol is illustrated below as receptor (A), see Figure 2.2. Please Note - The Flood Map for Surface Water provides an indicative outline of areas that may be susceptible to surface water flood risk, it does not indicate actual risk.

Figure 2.2 Example of a Thanet 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), the Thanet district has been split into four drainage areas, see Table 2-1 and Figure 2.3. The drainage areas have been split using the topography of the landscape (DTM), historic events (from RMAs), mapped outlines (Flood Zones and Flood Maps for Surface Water (1 in 200yr, deep)), and where appropriate they have been informed by KCCs Local Flood Risk Management Strategy policy units.

Drainage Area	Location
DA001	Thanet Rural
DA002	Birchington and Margate
DA003	Broadstairs
DA004	Ramsgate

Table 2-1 Drainage Areas

Figure 2.3 Thanet 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;

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 data.

Maps to accompany the summary sheets are also provided for each drainage area illustrating:

- Historic Flooding this map detail the location of the historic flood data as provided by the key partners.
- Surface Water and Critical Infrastructure this map illustrates the FMfSW and the NRD.
- Watercourses and Drainage Systems this map illustrates the rivers and sewer network within Thanet.

3 Sustainable Drainage Systems

3.1 Feasibility of SUDS in Thanet

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 land-use and in the case of SUDS which involve infiltration, soil type, underlying geology and ground water conditions need also to be considered.

The underlying geology in Thanet is mostly permeable due to the bedrock formed of Thanet and Seaford Sand Formation, Margate Chalk Member and Seaford Chalk Formation.

Groundwater from the Chalk is used to supply water for drinking water, agriculture, horticulture and industry. It also feeds the springs that emerge along the coast and near the marshes. Thanet groundwater is extremely vulnerable to contamination as substances (natural substances and man-made chemicals) are able to pass rapidly through the thin soils and the natural fissures (cracks) in the Chalk rock to the groundwater below the ground surface.

Within Thanet the vulnerability ranges soils of high leaching potential (H) and soils of low leaching potential (L), the majority being classified as (H). Soils with high leaching potential are described as soils that do not have the qualities to attenuate diffusion of source pollutants. Soils that have a high leaching potential are concentrated around the urban areas within Thanet.

Once the Chalk and groundwater is contaminated at a site by a substance it can take decades to clean-up. The Environment Agency has worked hard to prevent contamination by consistently applying groundwater protection policies to any proposed land-use change in Thanet to reduce potential future impact.

The Kent Isle of Thanet Groundwater Body is contaminated with nitrates, pesticides, solvents and hydrocarbons at levels that are of concern. To prevent further deterioration and hopefully to show some improvement in quality The Environment Agency have developed a comprehensive long-term strategy. It should be noted that the contamination levels are only in the "raw" groundwater. The water company regularly test the groundwater and treat it accordingly so that there is no risk of contaminated water being put in to supply. The water company supply good quality water in accordance with strict regulations [Drinking Water Supply Regulations].

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" section⁵. There are Zone I - Inner protection Zones and Zone II - Outer Protection Zones within the Thanet 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 show three main zones (inner, outer and total catchment) and a fourth zone of special interest which may apply to a groundwater source.⁶

To ensure protection from further deterioration of groundwater quality, there are likely to be restrictions on any proposed SuDs devices involving infiltration. The acceptability and construction details of infiltration devices is not only based on whether a site is in an SPZ but also depends on if the ground conditions are suitable (i.e. free from contamination) and if there is adequate unsaturated zone to offer attenuation of the discharge.

⁵http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

⁶ http://www.environment-agency.gov.uk/homeandleisure/37833.aspx

Thanet SWMP Stage 1 Report.doc

Figure 3.1 Groundwater Source Protection Zone

The Thanet SFRA⁷ identifies that SUDS are the preferred method of surface water management within the District. It also highlights where land take and groundwater protection allows, infiltration SUDS have a medium potential. Where infiltration is not possible, the SFRA states that preference should be given to discharge surface water into watercourses rather than into foul water drains.

Further background information with regards the use and types of SUDs is provided within Appendix D.

⁷ http://www.thanet.gov.uk/pdf/C016i2%20Thanet%20District%20SFRA%20Volume%201.pdf Thanet SWMP Stage 1 Report.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 Thanet 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), it should be noted that the first and fourth action highlighting areas that may need may need monitoring in the future.

Table 4-1 Generic Action Plan

	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, TDC, EA, IDB and SW should develop and implement a targeted maintenance schedule so that the highway gullies, drains and other drainage assets (including SUDS),1. Use the stage record where exis and who owns an maintaining it. Re available to all paintenance	1. Use the stage 1 SWMP to identify and record where existing drainage infrastructure is and who owns and/or is responsible for maintaining it. Records of assets should be available to all partners.	ксс	EA, TDC & SW, IDB	Quick win	High
		watercourse and sewers operate effectively to their design capacity. Of note, maintenance schedules of gullies should be reviewed as a high priority as currently both KCC, IDB and TDC are undertaking maintenance programmes.	2. Key Partners should develop a coordinated maintenance schedule using information in the SWMP (areas at high risk of flooding, natural flow routes).	ксс	EA, TDC, IDB	Medium Term	Medium

	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)	Priority (When?)*	Indicative Relative Cost
			3. Key Partners to continue to invest in hydraulic improvements, including de-silting, root removal and minor collapse repair, to reduce the risk of property flooding.	ксс	EA, TDC, IDB	Ongoing	Medium
			4. Key Partners to communicate coordinated maintenance activities with the public to manage expectations.	ксс	EA, TDC, IDB	Short Term	Low
0	All Drainage Areas	Raise awareness within the LLFA, Partner Organisations and the general public regarding the current policy for surface water management, specifically SUDS within the evidence base documents – Thanet District Council SFRA.	1. Ensure all new developments take into account their responsibility to incorporate SUDS into new development in accordance with : the NPPF, TDC SFRA (Section 13) and the relevant SUDS Approving Body (SAB)	IDB, TDC	EA, KCC	Ongoing	Low
2			2 Ensure new developments do not increase the risk of surcharge of sewer network within their catchment.	TDC, SW	ксс	Ongoing	Low
			3. Stakeholder engagement to inform the public about the benefits of rainwater reuse and recycling for e.g. Rainwater harvesting.	IDB, TDC, KCC, EA	SW	Ongoing	Low
0.1		Develop and implement a monitoring strategy for areas highlighted within the FMfSW deep. * It should be noted that the areas identified,	1. Use the Stage 1 SWMP to identify a list of areas highlighted within the FMfSW at risk from deep flooding.	IDB EA, KCC	TDC	Ongoing	Low
3*	All Drainage Areas	are areas that do not necessarily have a history of flooding, rather they have been indicated as areas of potential risk by the FMfSW (1 in 200yr deep)	2. Develop a monitoring schedule of these areas to check and verify the mapping during extreme events	IDB, EA, KCC	TDC	Ongoing	Low
4	All Drainage Areas	Where there is an existing known problem, KCC to consider permitting temporary routing of surface flow along roads using traffic calming and signage as required.	Develop measures to permit roads to be used for routing of excessive surface water, for e.g. shallow storage by lowering roundabouts and kerbside drainage.	ксс	TDC	Ongoing	Medium
5	All Drainage Areas	The limitations of the natural and manmade	Develop and implement a strategy for effective	KCC, IDB,	SW	Ongoing	Medium

	Applicable Drainage Areas	Action/Option (What?)	Priority Actions (How?)	Lead Action Owner	Supporting Action Owner(s)	Priority (When?)*	Indicative Relative Cost
		drainage systems and the relevant authorities need to be understood by LLFA and partners.	land and drainage management.	TDC			
6	All Drainage Areas	Raise awareness within the District regarding the problems caused by inappropriate tipping of Fats Oil and Grease (FOG) down the drains and gullies of TDC	Develop and implement a collection for of Fats Oil and Grease (FOG) within the TDC	TDC, SW, KCC	EA, IDB	Ongoing	Medium
7	DA02 & DA04	As a result of the findings of the Stage 1 SWMP certain areas have been highlighted as being at high risk. It is recommended that further detailed SWMPs are completed in Margate and Ramsgate (specifically Ramsgate Harbour)	Complete detailed SWMP of Margate and Ramsgate	KCC & TDC	EA and SW	Short Term	Medium

*Priority: Quick win = within 12 months. Short Term = up to 2 years. Medium Term = up to 5 years. Ongoing = regular monitoring.

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.

Drainage Area	Area of benefit (Receptor)	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
DA01	Flete	Flete	Anecdotal evidence suggests that there is a recurring issue with surface water runoff in this area. Solutions may include the following: Install green infrastructure or localised measures (fringe infiltration, kerbing, minor bunding, signage etc) to improve management of surface water during intense rainfall.	Improves drainage for residents of Flete	Include study within future schedule of works	ксс	TDC	Short term	Up to 50k
DA02	West Birchington	Dane Road	Anecdotal evidence from residents of Dane Road report that during periods of heavy	Identify issue with drainage					

Drainage Area	Area of benefit (Receptor)	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
			rainfall, water backs up within the drains. KCC have included within next year's capital works scheme to complete an investigation, i.e. CCTV survey of the system, to identify any problems and endeavour to improve the system.	and find a solution					
			A CCTV study to investigate the condition of drains and gullies on Dane road		Include study within future schedule of works	КСС	TDC	Medium to Ongoing	Up to 50k
			Improving conveyance through maintenance of local gullies.		Include gullies along Dane Road in maintenance schedule, ensuring frequency is adequate	КСС	TDC	Quick win	Up to 50k
DA02	South Birchington	Kings Road	Although no properties were recorded as being affected, flood water reached 2ft (anecdotal). A possible solution may include: Install green infrastructure or localised measures (sunken roundabouts, kerbing, minor bunding, cignoge etc) to improve	Improve drainage on Kings Road	Include study within future schedule of works	ксс т	TDC	Medium Term	Up to 50k
			management of surface water during intense rainfall.						
DA02	Margate South (including QEQM)	Nash Road	Highways have highlighted that Nash Road is an issue. It has been described as a combination of land management, highway drains and soakaways. It will be investigated as part of next year's capital scheme of works						
			A study to investigate the condition of drainage infrastructure on Nash road		Include study within future schedule of works	ксс	TDC	Medium to Ongoing	Up to 50k
DA02	Margate South (including QEQM)	St Peters Road QEQM, Cricket Grounds	Although there are no incidents recorded, where properties have been affected. There are repeated occurrences of flooding on the roads with reported depths of 6inches and 2 ft. The following option may be considered:						
			Consider use of green infrastructure or localised measures (kerbing, minor bunding, signage, fringe interception etc) in the upper catchment to improve management of surface water during intense rainfall.	Improved drainage	Include study within future schedule of works	ксс	TDC	Short term	Up to 50k

Drainage Area	Area of benefit (Receptor)	Location of action	Action	Benefits	Next Steps	Action Owner	Supporter	Priority *	Indicative Cost (£) **
	Margate South (including QEQM)	Tivoli Brook	Ownership of this watercourse is a long standing issue between all partners of this SWMP	All parties					
DA02			Define which partner/ group has ownership and responsibility of of the Tivoli Brook		Organise negotiations and agree between all partners and their legal teams the ownership of Tivoli Brook.	ALL	ALL	Quick win	Up to 50k
			Numerous historic incidents within this area						
DA02	Cliftonville	Northdown Road	Install green infrastructure or localised measures (sunken roundabouts, kerbing, minor bunding, signage etc) to improve management of surface water during intense rainfall.	Drainage Northdown Road	Include study within future schedule of works	ксс	TDC	Medium Term	Up to 50k
DA03	St Peter's (west)	Belgrave Road	There are repeated occurrences of flooding at this location, depths of up to 1.5ft have been recorded and properties have been affected. A new deep bore soak away was installed on the Belgrade Road.						
			Include regular maintenance of improved soakaway	Drainage on Belgrave Road	Include soakaways in maintenance schedule, ensuring frequency is adequate within future schedule of works	ксс	TDC	Short term	Up to 50k
DA03	Broadstairs	High Street	Consider use of green infrastructure or localised measures (kerbing, minor bunding, signage, fringe interception etc) in the upper catchment to improve management of surface water during intense rainfall.	High Street	Include study within future schedule of works	ксс	TDC	Short term	Up to 50k
			Anecdotal reports describe flooding of						
DA04	Ramsgate Harbour	Newington	From the maps it appears that most of the town's drains are directed to this area. Investigate opportunities for redirecting/storing surface water further out from Ramsgate Harbour, to areas like Newington. Complete detailed SWMP of Ramsgate (specifically Ramsgate Harbour)	Ramsgate Harbour	Include study within future schedule of works	ксс	TDC	Short term	Up to 50k

* Priority: Quick win = within 12 months. Short Term = up to 2 years. Medium Term = up to 5 years. Ongoing = regular monitoring. ** 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* Thanet. Some partner organisations, the Environment Agency, Southern Water and Kent County Council have flood risk management responsibilities beyond the geographic scope of this study, and therefore the priority of actions within Thanet 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.

Margate and Ramsgate were ranked 9th and 10th within the summary of settlement flood risks from 1 in 200 year greater than 0.3 m surface water event (ranked by dwellings at risk) detailed within the PFRA.

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 Thanet these may include:

- Defra (Flood Defence Grant in Aid through the Environment Agency)
- Kent County Council (highways)
- Southern Water
- River Stour (Kent) IDB
- Network Rail
- Industrial estate owners and businesses
- New developments (directly through the developer or through CIL)
- Local communities
- Thanet District Council

It is likely that schemes in Thanet 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 biodiversity.

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 SWMP Action Plan should be reviewed and updated once every six years as a minimum, but 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.

Offices at

Atherstone

Doncaster

Edinburgh

Haywards Heath

Limerick

Newcastle upon Tyne

Newport

Saltaire

Skipton

Tadcaster

Thirsk

Wallingford

Warrington

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

t:+44(0)1756 799919 e:info@jbaconsulting.com

Jeremy Benn Associates Ltd Registered in England 3246693

Visit our website www.jbaconsulting.com