KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 20th July, 2015

2.00 pm

Council Chamber, Sessions House, County Hall, Maidstone

Kent County Council
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AGENDA

KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 20th July, 2015, at 2.00 pm Ask for: **Andrew Tait**

Council Chamber, Sessions House, County Hall, Maidstone Telephone **03000 416749**

Tea/Coffee will be available 15 before the start of the meeting in the meeting room

Membership

Conservative (4):	Mr M J Harrison (Chairman), Mr A H T Bowles, Mr L B Ridings, MBE and Mrs P A V Stockell
UKIP (1):	Mr J Elenor
Labour (1)	Dr M R Eddy
Liberal Democrat (1)	Mr M J Vye

UNRESTRICTED ITEMS

(During these items the meeting is likely to be open to the public)

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1. Membership. To note that Mr J Elenor has replaced Mr D Baker as a Member of the Committee

2. Substitutes

3. Declarations of Members' Interest relating to items on today's agenda

4. Minutes of the meeting on 10 March 2015 (Pages 5 - 14)

5. Presentation by Mr Paul Cobbing - Chief Executive of the National Flood Forum

6. Flood Risk to Communities (Pages 15 - 86)

7. Environment Agency and Met Office Warnings and Alerts since the last meeting (Pages 87 - 90)

8. Other items which the Chairman decides are Urgent

EXEMPT ITEMS

(At the time of preparing the agenda there were no exempt items. During any such items which may arise the meeting is likely NOT to be open to the public)

Peter Sass
Head of Democratic Services
03000 416647

Friday, 10 July 2015

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KENT COUNTY COUNCIL

KENT FLOOD RISK MANAGEMENT COMMITTEE

MINUTES of a meeting of the Kent Flood Risk Management Committee held in the Council Chamber, Sessions House, County Hall, Maidstone on Tuesday, 10 March 2015.

PRESENT: Mr M J Harrison (Chairman), Mr L Burgess (Substitute for Mr D Baker), Mr A H T Bowles, Dr M R Eddy, Mr L B Ridings, MBE, Mrs P A V Stockell, Mr M J Vye, Mr P Vickery-Jones (Canterbury CC), Mr L Croxton, Mr J Scholey (Sevenoaks DC), Mr A Hills (Shepway DC), Mr G Lewin (Swale BC), Mr H Rogers (Tonbridge and Malling BC), Mr D Elliott (Tunbridge Wells BC), Ms G Brown (KALC), Mr M Tapp (River Stour IDB) and Mr P Flaherty (Kent Fire and Rescue)

ALSO PRESENT: Mr M A C Balfour and Mr C Pearman

IN ATTENDANCE: Mr M Tant (Flood Risk Manager), Mr T Harwood (Resilience and Emergencies Manager) and Mr A Tait (Democratic Services Officer)

ALSO IN ATTENDANCE: Mr S Curd (Environment Agency)

UNRESTRICTED ITEMS

1. Minutes of the meeting on 17 November 2014
(Item 3)

(1) Mr Vye asked in respect of Minute 17 (23) whether a list of planned improvements by Southern Water could also be provided. Mr Tant replied that he would request this information from Southern Water. He asked the Committee to bear in mind that the water companies were just starting their new five year improvement programmes and that OFWAT had become less prescriptive about the order in which they needed to be undertaken and that the information provided might, in consequence, be less comprehensive than Members would wish.

(2) RESOLVED that the Minutes of the meeting held on 17 November 2014 are correctly recorded and that they be signed by the Chairman.

2. Kent Resilience Forum Pan-Kent Flood Group
(Item 4)

(1) Mr Harwood said that the Kent Resilience Forum had been set up in response to the Civil Contingencies Act 2004 which required Local resilience Forums to be established for key emergency planning partners and stakeholders to enhance planning and response for major emergencies within their operational areas.

(2) Mr Harwood continued that the Kent Resilience Forum had recently established the Pan Kent Flood Group whose role was to ensure the implementation of all the outstanding actions arising out of the 2013/14 winter events and enhance local preparedness for flood emergencies.

(3) A key piece of work for the Group would be around coastal flooding planning and response. Kent had some 350 miles of coastline, and the South East was actually gradually sinking as a result of sea level rise linked to a warming planet and the geological phenomenon of glacio hydro-isostatic rebound. Part of the value of the Pan Kent Flood Group would be to act as a catalyst and advocate for the flooding agenda across the other groups which made up the Kent Resilience Forum.

(4) The Chairman referred to a letter from Dan Rogerson MP, the Parliamentary Under Secretary of State for Water, Forestry, Rural Affairs and Resource Management which advised local authorities to put their draft flood risk management strategies out for public consultation by the end of March 2015. He noted that a number of Lead Local Flood Authorities had yet to publish their strategies and stressed the role of elected Members in ensuring that this happened in their authorities.

(5) Mr Harwood responded to a question from Dr Eddy by saying that the Pan Kent Flood Group was currently meeting monthly because of the significant workload and that an update report would be presented to future meetings of the Committee as a standing item.

(6) RESOLVED that the establishment of the Kent Resilience Forum Pan Kent Flood Group be noted and that progress reports be tabled at future meetings of the Committee.

3. Drainage Consultee Role
(Item 5)

(1) Mr Tant introduced the report by saying that the Flood and Water Management Act contained a Schedule which proposed to make KCC a drainage approval body, having the role of approving and potentially adopting drainage schemes from new developments. This role would have sat alongside the planning application process.

(2) Mr Tant went on to say that Defra had found it very challenging to bring about full implementation of this role due to concerns over how the adoption role would sit alongside planning and how long-term maintenance would be funded.

(3) In consequence, Defra had decided to consider different options to resolve the SuDS issue.In October 2014, Defra and DCLG had issued a consultation on an alternative approach. This involved strengthening the planning regime around SuDS in terms of maintenance and enforcement.

(4) Mr Tant referred to KCC's response document which supported the general direction of the proposal but did not consider that it would achieve any improvement to current SuDS provision, particularly in respect of maintenance. The consultation document had envisaged that maintenance of SuDS would be a planning condition subject to perpetual enforcement (which would be at odds with the existing enforcement regime).

(5) DCLG had followed this with another consultation in December 2014. This had included making Lead Local Flood Authorities statutory consultees within the

planning regime for surface water on major developments. This proposal was supported by KCC even though it was still considered that the proposal itself would not improve the type of SuDS or their long term maintenance.

(6) Mr Tant then said that KCC also had significant reservations about the New Burdens Assessment which set out what DCLG believed it would cost to implement and the revenue it would give to support it. It was considered that the amount of time needed to fulfil this role was being significantly underestimated and also because there was no assessment in the document of the additional burden that would be placed on planning authorities. One issue that had not been considered was that drainage details would often not be part of the original submission for a major planning application but would be submitted later as details in respect of a planning condition. The time required to undertake the enforcement role had also not been included.

(7) Mr Tant added that the DCLG consultation period had now closed. To date there had been no update from DCLG (even though it had been hoped that this would be published in time for oral communication to the Committee). It was now expected on 20 March.

(8) The Chairman commented that it had taken at least six years to reach this point and that maintenance remained a major issue. He referred to the visit to the SuDS scheme at Singleton Hill in Ashford that the Committee had undertaken in March 2014, where the scheme itself had been excellent but had clearly suffered as a consequence of multiple bodies having responsibility for different parts of it.

(9) Mr Rogers said that he had received a copy of a letter written by the LGA to Liz Truss, Secretary of State for Environment, Food and Rural Affairs. He read out one of the recommendations which was:-

"In the longer term our view is that the responsibility for approval, adoption and maintenance of SuDS should sit with water and sewerage companies within their existing regulatory regime. It is also our view that the cost of processing applications should be fully funded by the planning application scheme."

(10) Mr Tant that KCC would have some misgivings about water companies adopting them, because a number of water companies were not interested in sustainable drainage, preferring more traditional methods. The concern was that this approach would not necessarily lead to the best sustainable drainage systems. Nevertheless, KCC was not completely at odds with the LGA's views because it did recognise the need for an adopting authority.

(11) Mr Scholey said that DCLG seemed to believe that the SuDS issues could be resolved through planning conditions. In his experience, planning conditions were effective up to the point where a property was transferred from the developer to the resident. He asked how a planning condition could be enforced after the developer had left the site.

(12) Mr Tant replied that he was not sure what mechanism the DCLG had in mind. There would, he thought, be a charge for the wider use of the drainage system. He agreed that KCC considered the point Mr Scholey had made to be one of the grounds for its misgivings about the proposal.

(13) Mr Harwood suggested that it could work if there was a legal agreement for long term maintenance signed by the developer at the time.

(14) Mr Vickery-Jones said that developers were often close to dismissive of what planners required of them. There had been many instances in Canterbury where the planning authority had been completely overruled by the Inspector at the planning appeal stage. It was vital for the Districts that the strategic overview role (usually played by KCC) was clarified.

(15) Mr Bowles said that the seriousness of the matter in hand contrasted with the delays in implementation which were occurring because of the lack of clear direction at the national level. He did not believe that there was no solution to be found. A full, focussed discussion involving all interested parties would be able to put an end to the cycle of consultation documents, which simply led to yet another round of consultation. Meanwhile, sustainable drainage was being installed but not inspected or maintained. He suggested that the Chairman and Cabinet Member should write to the Secretary of State stressing the urgent need for a solution that worked.

(16) Mr Balfour said that KCC had written to the Secretary of State on a number of occasions over the previous six years whenever this topic had arisen. He was willing to do so again in his role as the new Cabinet Member for Environment and Transport.

(17) Mr Balfour went on to say that he was aware that it was perfectly simple to design a really good urban scheme with a SuDS element that was attractive and which could be maintained as it was part and parcel of the development. He agreed that responsibility was currently being passed from one body to the next and that it was not clear who was going to pay for it. He was also concerned over the practical problem of providing the designers of the schemes and the technical expertise within the planning authorities to analyse them.

(18) At the invitation of the Chairman, Mr Harwood described the new retail development on Bearsted Road near Junction 7 of the M20. Ever since the retail scheme had gone in, the long-established local highway flooding had disappeared as a result of reductions in run-off achieved by the SuDS approach utilised within the site. The drainage scheme utilised a void with stepped rock-filled gabions beneath the store which effectively reversed the flow of surface water within the site to facilitate more effective infiltration to groundwater. This demonstrated that SuDS did not necessarily have to be a visible feature within a development and that it could work in higher density urban situations.

(19) Mrs Stockell said that it was likely that many developments in Kent would be completed before any SuDS work was actually undertaken. She then said that the Water and Wastewater in Ashford Select Committee had met in 2000 and had recommended SuDS due to the high amount of concrete in Ashford which made effective water run-off difficult to achieve. She noted that KCC was already providing three half-day workshops and asked whether there had been any feedback from them.

(20) Mr Tant confirmed that KCC had undertaken training for the Districts in respect of the role that KCC had been expecting to fill. This would continue into 2015/2016.

(21) Mr Tant continued by saying that it was expected that the LLF Authorities would become statutory consultees for drainage schemes in new major developments. This role would probably commence in April 2015. There would also be consequential amendments to the NPPF in respect of sustainable development and its drainage.

(22) Mr Tant replied to a question from Mrs Stockell by saying that work had been undertaken with internal KCC functions such as Property and Infrastructure Support in respect of school buildings. It was very important that KCC was seen as setting a good example in drainage matters. He added that a SuDS scheme was currently being developed for an extension to a school and that it was hoped that this would lead to further similar projects.

(23) Dr Eddy said he was concerned about the number of substantial developments that were going through the planning process on the edge of Flood Plains or which were pumping water into systems that were already at full capacity. He identified three areas which he suggested the Cabinet member should take up with the Minister. These were: Training, particularly for those involved in the planning process who might well be inexperienced in this particular area of work; Burdens, as much of the work was not being funded; and Maintenance of the long term sustainability of the SuDS. He then said that he was interested in the relationship in thinking between that of KCC and that of the LGA and asked whether these two organisations were likely to be able to reach the point where they were a combined voice for Local Government. He believed this to be essential if the issues he had raised were to be addressed.

(24) Mr Tant replied that the only area of disagreement between KCC and the LGA was over whether the water companies were best placed to take responsibility. This was, however, not a fundamental difference. The LGA had been negotiating on behalf of the local authorities with the DCLG over the new Burdens Assessment. There were some differences as might be expected given the large number and diversity of local authorities involved. Nevertheless, KCC and the LGA were very much of one mind in respect of the current consultation.

(25) Mr Bowles said that Swale BC was desperately trying to recruit Planners. The training that was likely to be required for them would be at the expense of their ability to swiftly deal with issues that arose, causing delays in process and implementation, and potentially leading to decisions on applications being taken by planning inspectors instead of local authorities. He believed that there were a sufficient number of Kentish representatives on the LGA who were in a position to influence that organisation's approach. He would be discussing with the Leader of the Council the most effective way of doing so.

(26) The Chairman suggested that someone in a position of authority within the LGA could be invited to speak to the next meeting of the Committee. Mr Bowles undertook as a member of the LGA to invite someone on the Committee's behalf.

(27) Mr Tapp commented on the proposed exemption of minor developments from the revisions to the planning policy and guidance. He said that in some areas this could lead to 150 houses being built in batches of ten, effectively leaving a large development which was exempt from policy and guidance on local drainage systems.

He suggested that if there was to be an exemption the bar should be set at one or two rather than ten.

(28) Mr Tapp then said that in respect of major developments which needed long term maintenance, the specifications in Ashford and Canterbury were extremely good. He then asked whether there would be provision for KCC to request that charges be built into the registry deeds of people who bought the properties. He would be quite happy for this to be done through the rates but was not sure whether differential rates would be legal.

(29) Mr Bowles said that differential rates could not be applied by a billing authority. The IDBs were not answerable to a local authority and were entitled to put up their precept as they considered appropriate. In his view, the IDB precept should be included as a headline in the Council tax bill as this would enable them to be accountable for (and therefore able to explain) every increase.

(30) Mr Balfour said that it was theoretically possible to hold the owner of a property to account in perpetuity. This would, though, be a very complicated process, involving high legal fees.

(31) Mr Rogers commented on the minor exemptions provisions in the consultation document by saying that at District level, planning authorities made numerous efforts to encourage SuDS by, for example, conditioning permeable surfacing. He then said that a significant recent change in the planning process enabled pre-application consultation with the developers so that planning authorities could advise developers on a chargeable basis. He considered that this principle could be extended to Lead Flood Authorities to enable them to advise on SuDS at the pre-application stage.

(32) The Committee expressed its concern over the lengthy and time-consuming consultation process which was delaying effective SuDS implementation and also confirmed that it wished to invite a representative from the LGA to speak at its next meeting.

(33) RESOLVED that, subject to (32) above, the report be noted.

4. Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since the last meeting.
(Item 6)

(1) Mr Harwood drew the Committee's attention to the variance between the Alerts and Warnings recorded in the past few months and those received during the corresponding period in the previous year. In 2013/14 (November to March) there had been 41 warnings and 5 severe warnings whereas this year there had been 9 warnings and no severe warnings. The comparison was even greater when the figures for Met Office Severe Weather Flood Alerts and Warnings were set against one another. There had been just 10 since the last meeting compared to 87 in 2013/14. The Thames Barrier had been closed on 4 occasions since the last meeting as opposed to 49 times in the corresponding period in 2013/14. A total of 11 significant flooding related emergencies had been reported to the 24/7 KCC Emergency Planning Duty Officer since the last meeting. The figure for 2013/14 had been 66.

(2) Mr Flaherty said that Kent Fire and Rescue had invested a considerable amount of time and work in communities, resilience and equipment and this had resulted in improved response to those events that had occurred. He confirmed that his service had also seen a far lower level of flood-related activity than during the previous year.

(3) Mrs Brown reported that Yalding had not even had to deal with water on the road during the winter. The only issue that her parish had taken up with the Environment Agency was that warnings had been given at a very early stage. These warnings were, by their nature, not accurate enough. It would be preferable if the warnings were given once it became clear that an event was actually going to occur. She was pleased with the revisions made to the warning zones as this now meant that warnings could be given to those actually affected rather than to an entire stretch of river.

(4) Mr Curd (Environment Agency) said that there had been some difficulties with the warning system in the Medway catchment area. Owing to the size of the warning zones, a number of communities had received warnings when it had not been appropriate for them to do so. As a result (and following consultation with the communities) these warning zones had been reorganised by increasing their number and reducing their size. Work was still being undertaken on identification and confirmation of the correct trigger levels.

(5) Mr Vickery-Jones informed the Committee of Mr Ted Edwards' imminent retirement after many years as Canterbury CC's Engineering Manager. The Committee formally expressed its appreciation for his outstanding service and wished him a very happy retirement.

(6) Mr Hills said that on 30 September 2014 Kent had seen the highest tide levels in 25 years (11 tides over 8 metres). It was therefore critical (particularly in the Romney Marsh area) that the EA and IDB carried out the re-cutting to a high standard this year. It was essential to avoid complacency.

(7) RESOLVED that:-

(a) the level of alerts received since the last meeting of the Committee be noted; and

(b) Mr Ted Edwards be personally thanked for his many years of outstanding service and wished a happy retirement.

5. Oral Update by the Environment Agency on Flood Risk Mitigation in Faversham *(Item 7)*

(1) Mr Curd said that 22 properties and 2 businesses in Faversham had been badly affected by the North Sea tidal surge of December 2013. The EA had been working with KCC, Swale BC and the local residents Association to develop a scheme that would help protect these properties. He was pleased to be able to confirm that sufficient funding contributions had been secured for the scheme to be taken forward. He thanked Mr Bowles for his assistance in this matter and added that he had been informed shortly before the meeting that Faversham TC would also be making a financial contribution.

(2) Mr Curd continued that the design of the scheme had been passed to the East Kent Engineering Partnership. The detailed design and cost estimates for the works were expected by the end of March 2015 and construction was expected to commence during the summer months.

(3) Mr Bowles thanked Mr Curd and Mark Douch as well as the EA generally for the pro-active way in which they had helped bring the scheme into fruition. He also acknowledged the contribution made by Mr Balfour at the meeting where funding had been secured.

(4) RESOLVED that the report be noted.

6. CPRE Flood Conference 2015 - Oral report by Paul Flaherty (Kent Fire and Rescue)
(Item 8)

(1) Mr Flaherty informed the meeting that he had recently become the Resilience Director for the Channel Tunnel. He then reported on the recent CPRE Flood Conference. He said that it had engaged itself in issues such as Planning and building on Flood Plains and some of the measures that needed to be considered in the light of the need for housing. There had been a number of high level speakers such as Damien Green (MP for Ashford) and Helen Grant (MP for Maidstone and the Weald). The Conference had been well received and well attended but had taken place in isolation from many of the agencies that had carried out work in the County.

(2) Mr Flaherty went on to update the Committee on other significant events that had recently taken place. Exercise Wade had been held on 9 December 2014 at the Tonbridge and Malling Council Offices. This had been a Resilience Forum table top exercise to try out all the changes that had been made to the various Plans and procedures as a result of the previous winter's experience. Following this exercise, both the Pan-Kent response and the Recovery Plan were being reviewed.

(3) A joint seminar had been funded by Defra for the East Kent Flooding Groups. This involved the Resilience Forums from Kent and Essex working together to discuss East Coast flooding. The outcome of this seminar was that it would lead to closer working between the two Resilience Forums. Examples of this would be joint training, joint exercising and harmonisation of procedures.

(4) Mr Flaherty then said that the Kent resilience Team had drafted an Animal Evacuation and Shelter Plan which was currently going through the consultation stage within the Kent Resilience Forum. It was expected to be operational by the time of the next meeting of the Committee in July 2015.

(5) Mr Vickery-Jones said he had attended the South East Architects presentation. This had mainly focussed on anti-social behaviour but had also discussed designing out flooding. He added that he had attended the CPRE Conference and had been left asking the question why there was no great emphasis on designing properties to withstand flooding issues. He believed that the best solution for new development was to design it to be flood-resistant rather than by seeking to build perimeter defences that would require a long term maintenance

commitment. This was particularly important given Canterbury CC's recent experiences where Planning Inspectors had overturned the Council's refusal of developments on flood plains.

(6) Mr Pearman said that in the Kent Fire and Rescue Service had performed an absolutely invaluable task in Edenbridge during the 2013/14 flooding events. Although the river had not overflowed, the town had been flooded by standing water. This effort had been hindered because the Edenbridge Depot had undergone a staffing crisis making it impossible for anyone to be deployed from there. If there had been severe weather in 2014/15, the Edenbridge Unit would not have been operational. He said that no one should underestimate the reassurance to the community that uniformed Fire and Rescue staff could provide in times of flooding. Fortunately, the Unit was expected to become operational again in April 2015 once all the volunteers had completed the necessary training. He believed that any reductions in staffing levels or redeployment needed to be communicated to the Kent Resilience Forum itself.

(7) Mr Harwood said that a key issue was the need to avoid complacency. Resilience and preparedness needed to be increased year-on-year by refining emergency planning and response, improving engineering solutions and enhancing spatial and planning management and practice. He then informed the Committee of a multi-agency off-site emergency planning exercise that was taking place for the Dungeness B Nuclear Power Station. The scenario would be a focused around severe weather/tidal flooding event, and would involve some 200 participants.

(8) Mr Flaherty said that it was not the case that the appliance at Edenbridge was not operationally available. Most of the pumps in Kent were crewed by on-call staff and were utilised when needed on the basis of risk data. Staffing issues at some stations were being addressed. Kent Fire and Rescue's stations were strategically located around the County and were not for the exclusive use of the village in which they were based. He said that the Committee could be re-assured that the Service would always be able to meet the need to place sufficient staff in any location where they were needed. Kent Fire and Rescue also had arrangements with each of its neighbouring counties to provide or receive cross-border support. All the appliances that the Service needed were available for deployment whenever the need arose.

(9) Mrs Brown underlined Mr Harwood's point about the need to avoid complacency. Whist she had nothing but the highest praise for the work of the EA and Kent Fire and Rescue, there was a limited number of staff to carry out all the necessary tasks. Each community needed to avoid the pitfall of over-reliance on these Services. They needed to ensure that the necessary plans and individual property plans were in place, and that seemingly insignificant issues such as the availability of operational mobile phones and chargers were addressed.

(10) RESOLVED that the report be noted.

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To: Kent Flood Risk Management Committee

From: Michael Harrison, Chairman of the Kent Flood Risk Management Committee

Subject: Flood Risk to Communities

Classification: Unrestricted

Summary:

The Kent Flood Risk Management Team has produced a document that provides an overview of all forms of flood risk for the districts of Kent, the bodies responsible for managing the flooding and what plans there are for managing flooding in that area.

These documents are intended to provide a simple overview of flood risk and provide signposts to more detailed information.

Recommendation:

That Members:

- Note the draft Flood Risk to Communities: Canterbury, and
- Provide comments on the document and how it can be improved.

1 Introduction

1.1 The Flood Risk Management Team has prepared some draft documents that set out the flood risk to the boroughs and districts in county, which are have called Flood Risk to Communities.

1.2 The purpose of these documents is to provide a simple document that gives and overview of all forms of flooding in an area, rather than just the flood risk that a particular risk management authority may be responsible for. The documents also give an overview of who is responsible for managing flood risk and flooding emergencies. They contain links to the various strategies, plans and policies that provide more information on specific flooding issues or how they are planned to be managed.

1.3 The Flood Risk to Communities documents contain appendices that break the district into the county electoral wards and provide a more detailed picture of flood risk in that ward. They also include any proposed works that are planned by the risk management authorities in that area.

1.4 The purpose of these documents is not to provide a detailed account of flooding in an area, but to give a basic one-stop overview of flooding and act as a reference guide if the reader would like more information.

1.5 It is intended that these documents will remain live and be updated when significant new information is published.

2 Background

2.1 The purpose of the documents is to address a number of issues that have arisen since KCC became the Lead Local Flood Authority. As Lead Local Flood Authority, KCC has a duty to publish a Local Flood Risk Management Strategy, which sets out how we will manage local flood risk in the county. This is understandably misinterpreted by some readers as that will detail flood risk management in their local area. Unfortunately the Local Flood Risk Management Strategy only provides some of this function.

2.2 During the flooding of winter 2013/14 KCC was contacted by a number of local representatives, including local councillors, who wanted to know who was responsible for what in their area and what plans they may have.

2.3 As there are many risk management authorities with various powers and duties there is no single document that gives an overview of all flood risks and how they are managed.

2.4 The Flood Risk to Communities documents are intended to fill these gaps.

3 Document development

3.1 To date the Flood Risk Management Team has prepared three draft versions of the Flood Risk to Communities documents, for the districts of Canterbury, Maidstone and Tonbridge and Malling. The Flood risk to Communities: Canterbury is attached.

3.2 These have been consulted on with our professional partners, including the Environment Agency, the district councils concerned, the internal drainage boards and Southern Water. To date only comments for the Canterbury document have been received from all partners. They hope to receive further comments soon that will enable them to publish the other two documents.

3.3 Public consultation has not yet been undertaken on these documents. A small public consultation will be commencing shortly. If this consultation demonstrates that there is a need for these documents and that they adequately fill it the Flood Risk Management Team will begin to prepare drafts for the other districts in Kent.

4 Recommendations

That Members:

- Note the draft Flood Risk to Communities: Canterbury, and
- Provide comments on the document and how it can be improved.

Michael Harrison, Chairman of the Kent Flood Risk Management Committee

Contact Officer: Max Tant, Flood Risk Manager 03000 413466 max.tant@kent.gov.uk

Kent County Council

Flood Risk to Communities Canterbury

July 2015

www.kent.gov.uk

In partnership with:

Environment Agency

CANTERBURY CITY COUNCIL

This document has been prepared by Kent County Council, with the assistance of:

- The Environment Agency
- Canterbury City Council
- The River Stour (Kent) Internal Drainage Board
- Southern Water

For further information or to provide comments, please contact us at flood@kent.gov.uk

Introduction to Flood Risk to Communities

This document has been prepared for the residents and businesses of the Canterbury City Council area. It provides information on the nature and magnitude of the flood risk across the district, and outlines the existing and proposed approaches to manage the risk identified.

It has been developed with the help and support of the other Risk Management Authorities (RMAs) that operate in Canterbury. These include the Environment Agency, Kent County Council, Canterbury City Council, Southern Water, and the River Stour (Kent) Internal Drainage Board.

This document aims to provide a summary of:

- the main flood risks to the area,
- the key flood risk management assets/structures,
- any flood risk management plans or strategies that are in place and,
- where to find further information.

All links to plans, strategies and other pertinent information have been shortened to facilitate the use of non-electronic versions of this document.

This is a living document and will be periodically reviewed and revised as any relevant new information or plans become available.

CANTERBURY OVERVIEW

The administrative boundaries of Canterbury City Council are shown in Figure 1 below.

The district covers an area of 310sqkm and has 21.7 km of coastline. 16.9km of the coastline is managed by Canterbury City Council, with the remainder being looked after by the Environment Agency. In total, 15% of the district lies within Flood Zone 3 and is considered to be at high risk from flooding from the sea or rivers.

The Canterbury area is drained by numerous main rivers, smaller ordinary watercourses and ditches. In combination with rainfall runoff and groundwater emergence, these features give rise to differing levels and mechanisms of flood risk throughout the area. For example, some areas will be at risk from only tidal, fluvial, groundwater or surface water flooding, whilst other areas can be at a combined risk from more than one source.

Managing the flood risk throughout the district can therefore be a complex and challenging task.

Flooding from the sea was experienced along the northern coast in 1953 and 1978. These flood events caused significant damage and disruption to the area, and resulted in substantial investment to improve the standard of the sea defences protecting the area. These improved flood defences successfully prevented further large-scale inundation from the significant storm-surge events experienced in November 2007 and December 2013.

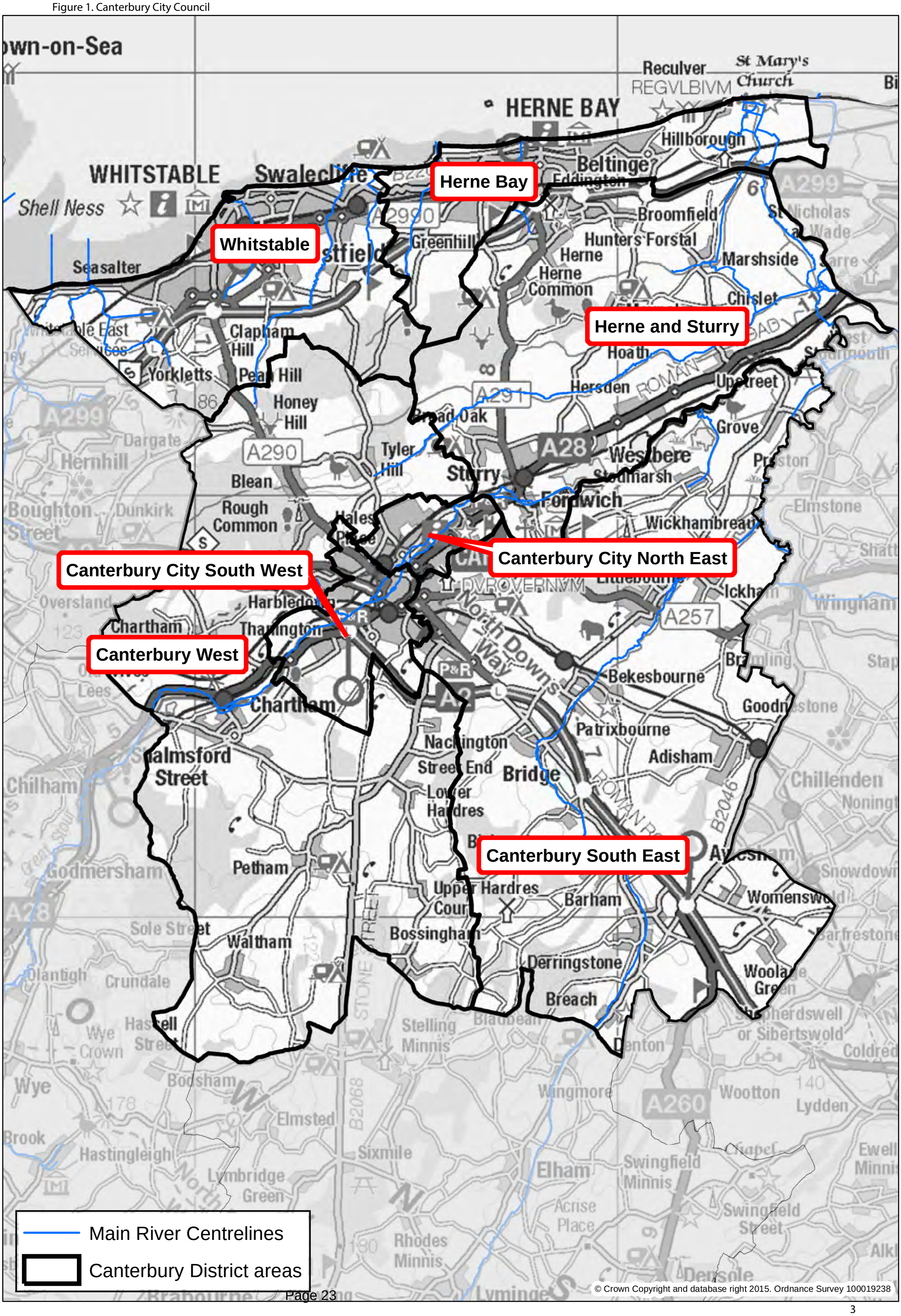
Fluvial Flooding occurred in autumn 1987, April 2000, Winter 2000/1 and Winter 2013/14 when the banks of the Great Stour and/or several of the smaller rivers and watercourses in the district were overwhelmed.

The Nailbourne and Little Stour are designated Main Rivers and are predominantly groundwater fed. The Nailbourne is an ephemeral stream, which anecdotally flows for a period of around six months every seven years. The occurrences of flow in the Nailbourne have been more frequent in recent years, with events recorded in 2000/1, 2003, 2010, 2012/13, 2013/14 and 2014/15. A number of improvements have been made to these watercourses and the improved management of flooding in the adjacent villages (Littlebourne, Bridge, Bishopsbourne, Patrixbourne and Barham) has reduced the risk to an estimated 1% - 2% AEP.

Flooding from the sea is managed by Canterbury City Council under the supervision of the Environment Agency. Flooding from main rivers (Great Stour, Little Stour and Nailbourne) continues to be managed by the Environment Agency, who are also responsible for defining the extent of the tidal/fluvial flood zones (usually derived from detailed computer models).

Flooding from surface water, groundwater and ordinary watercourses is recorded and overseen by Kent County Council in its role as Lead Local Flood Authority (with assistance from Canterbury City Council). These watercourses include the upper reaches of the Sarre Penn and the ephemeral Petham Bourne.

Figure 1. Canterbury City Council



ROLES AND FUNCTIONS IN THE MANAGEMENT OF FLOOD RISK

This section sets out the roles, responsibilities and functions of the main bodies that have a part to play in managing flood risk. Further information on the nature of these Risk Management Authorities (RMAs) is set out in Section 3.1 and Annex A of Kent County Council's Local Flood Risk Management Strategy.

The Local Flood Risk Management Strategy can be found at http://goo.gl/hpw021

THE ENVIRONMENT AGENCY

The Environment Agency (https://goo.gl/ohv7Jv) is a non-departmental public body, responsible to the Secretary of State for Environment, Food and Rural Affairs.

They are responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes, for example, setting the direction for managing the risks through strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery. The Agency also has operational responsibility for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea, as well as being a coastal erosion risk management authority. As part of its strategic overview role, the Environment Agency is producing with partner Risk Management Authorities (RMAs) Flood Risk Management Plans Flood Risk Management Plans (FRMPs) which will highlight the hazards and risks of flooding from rivers, the sea, surface water, groundwater and reservoirs, and set out how RMAs work together with communities to manage flood risk.

They have prepared the National Strategy for Flood and Coastal Erosion Risk Management to clarify their role and outline the principles that guide flood risk management in the UK (please see the following Plans and Strategies section for further information).

Their legal powers relating to FCRM are *permissive* and are largely set out in the Water Resources Act 1991 and the Flood and Water Management Act 2010. The term *permissive* means that they have the power to undertake flood and coastal risk management works but are not legally obliged to undertake such activity. The maintenance of a main river channel and its banks is ultimately the responsibility of the riparian landowner. The Environment Agency has powers of enforcement to ensure that riparian landowners keep any main rivers flowing through their land clear of obstruction.

As with any RMA, when they use their permissive powers they must comply with European legislation (particularly the Habitats and Birds Directives, the Floods Directive and the Water Framework Directive) and any other legal requirements.

They prioritise their investment in flood and coastal risk management works according to Government policy (and in line with Treasury guidance on economic appraisal). They implement Government policy such that public money is:

- spent on the works that provide the greatest benefits to society,
- is spent efficiently and effectively, and
- reflects a partnership approach.

They assess the costs, economic benefits, environmental impact and flood risk to set their spending priorities.

The Environment Agency also have a regulatory role to consent works carried out by others in, under, over or within eight metres of a main river or any associated flood defence (unless a watercourse is tidally influenced, in which case their permission must be sought for all works within 15 metres). The Environment Agency has statutory byelaws specifying the range of operations that are either precluded from occurring, or that require the Environment Agency's formal consent, within this area.

Their formal permission is required to ensure that those works do not adversely affect the operation of the drainage system or cause unnecessary environmental damage.

The local Environment Agency office should be contacted in advance of any planned works taking place. For further information on any of the above, please contact KSLE@environment-agency.gov.uk

Maintenance Protocol (2013)

Maintaining some assets that have been maintained in the past may no longer be economically justifiable or the work may not have a high enough priority for central government FCRM funding over the longer term. In these circumstances, they might decide not to maintain them in the future.

The River Stour and its tributaries are split by communities according to the risk of flooding and its economic impact, these are known as asset systems. Each system has a System Asset Management Plan (SAMP); this is a long-term plan covering a collection of assets. The SAMP includes information on the costs for maintaining and replacing assets over their life as well as details of the economic benefits within the system. The available maintenance budget is then directed to areas with the greatest need.

Kent County Council

Kent County Council has two main functions that affect flood risk management. They are both the **Lead Local Flood Authority** and the County's **Highway Authority**.

Additionally, and as with any riparian land owner, they are responsible for any land they own, and should maintain all ordinary watercourses and assets in their ownership.

The functions and associated responsibilities of the Lead Local Flood Authority and the Highway Authority are explained below:

Lead Local Flood Authority

Kent County Council (KCC) was made the Lead Local Flood Authority for Kent by the Flood & Water Management Act 2010; this means Kent County Council has a strategic overview role for **local** flooding (which is defined as flooding from surface water, groundwater and ordinary watercourses). As part of its role as Lead Local Flood Authority, KCC has produced a Local Flood Risk Management Strategy (please see the following Plans and strategies Section).

Kent County Council also has a duty to:

- Maintain a register and record of structures and features
- Undertake flood investigations
- Regulate proposals which affect ordinary watercourses
- Provide advice and guidance on the provision of Sustainable Drainage within new development as a statutory consultee within the planning process.

As Lead Local Flood Authority, Kent County Council is required to oversee the management of local flood risk; this includes the management of risk of flooding from ordinary watercourses. As such, Kent County Council's formal written Consent is required prior to undertaking any works which may obstruct the passage of water within an ordinary watercourse. Such works can include culverting, diversion and the construction of new dams/weirs, etc. They have powers of enforcement over any works which have been undertaken without consent and should be contacted in advance of the commencement of any proposed works. They can be contacted at flood@kent.gov.uk.

Highways Authority

Under the Highways Act 1980, Kent County Council has a duty to maintain the highways in Kent (apart from those managed by the Highways Agency). One of their responsibilities is to ensure that the highways are appropriately drained.

The Kent County Council Highways and Transportation department maintains the roadside surface water drains (also known as gullies) which allow rain water to run away freely from roads, pavements and cycleways. Table 1 shows the frequency of gully cleansing, according to the type of road.

Table 1. Highways drainage maintenance schedule.

Type of road	Description	Frequency
Flood routes	Roads known to flood frequently	Every 6 months
High speed roads	Roads with a speed limit of 70mph	Every 12 months
Strategic routes	Roads that are the main connection between towns and villages	Every 12 months
Urban and rural routes	All other roads	Targeted maintenance

The map in Appendix 1 shows the major and strategic routes across the Canterbury City Council area, along with the highways which receive more frequent maintenance owing to known drainage problems. Any road not depicted in red or green should be assumed to be a normal road that receives targeted maintenance, as required (as outlined in Table 1).

Other forms of drainage (catchpits, soakaways, pipes, highway ditches etc.) are checked and cleaned or repaired when required, or when a problems are reported to us.

Highways drainage problems should be reported at http://goo.gl/9qgjEe or by phone on **03000 41 81 81.**

CANTERBURY CITY COUNCIL

Canterbury City Council is a coastal district authority; as such it has powers to undertake works to prevent coastal erosion and flooding. Canterbury City Council is responsible for the management of all of the coastal defences along the frontages in Herne Bay and Whitstable. In the event of any works being planned which may potentially affect the defences or are within 15m of their landward toe, Canterbury City Council should be contacted to discuss their requirements. They can be contacted at flooding@canterbury.gov.uk.

Canterbury City Council has powers under the Land Drainage Act 1991 to carry out flood risk management work on ordinary watercourses. They also have the responsibilities of a riparian owner for any land they own and should maintain all ordinary watercourses and assets in their ownership.

Canterbury City Council also have a general responsibility to oversee all matters relating to drainage within the district and to provide information and advice to the public, including specific advice on land drainage. They should be contacted about watercourse alterations, disputes and maintenance of land drainage within council-owned land, and about emergency works elsewhere.

They are a key partner in planning local flood risk management works, and are able to carry out flood risk management works on minor watercourses within their district.

They also work with Kent County Council and the other Risk management Authorities to ensure that the risks to/from any new development are effectively managed through making decisions on planning applications. They are ultimately responsible for ensuring that any new development does not exacerbate the flood risk to the area in which it is proposed.

THE RIVER STOUR (KENT) INTERNAL DRAINAGE BOARD

The River Stour (Kent) Internal Drainage Board is the operating drainage authority within their designated drainage district; please see Appendix 2 for a map of this area. They manage and directly maintain approximately 175km of watercourses throughout this area.

Internal Drainage Boards use their powers to maintain watercourses within their district for land drainage, flood risk management, environmental protection/enhancement and water level management purposes.

In-channel weed cutting is currently carried out annually on all River Stour (Kent) Internal Drainage Board designated watercourses, where necessary, in order to maintain conveyance capacities to allow drainage, manage local flood risk and to control water levels.

Approximately 10% of the River Stour (Kent) Internal Drainage Board watercourses are de-silted each year (carried out on a 10 year rolling programme). Tree and shrub maintenance is carried out to allow free-flow and to maintain adequate access for routine channel maintenance. In-channel obstructions are cleared prior to and during periods of heavy

rainfall (mainly from bridges, culverts and other in-channel structures). Routine activities also include the operation and maintenance of approximately 140 water level control structures (feeds and stopboard weirs).

Whilst they undertake routine maintenance of adopted ordinary watercourses, pumping stations, and other critical water control infrastructure under permissive powers, the overall responsibility for maintenance still lies with the riparian owner.

They also have a general supervisory duty over all drainage matters within their districts and have consenting and enforcement powers for works carried out by others in or adjacent to ordinary watercourses within their operational district.

This is done by reasonable application of the board's byelaws and the Land Drainage Act 1991, to ensure that any development has regard to secure the efficient working of the drainage system now and in the future and does not cause unnecessary adverse environmental impact as a consequence, including increased risk of flooding.

If you are planning to undertake works on an ordinary watercourse within their district, please phone **01227 462377** or email enquiries@riverstouridb.org.uk.

The map at Appendix 2 shows the extent of the IDB areas within Canterbury District and shows the watercourses for which they are responsible.

SOUTHERN WATER

Southern Water is responsible for the maintenance of public sewers. These are usually in roads or public open spaces, but may run through private gardens. They have a right of access to these sewers for maintenance. If they wish to carry out work on sewers on your land they must follow a code of practice; this is available from them upon request.

To report a problem or for general enquiries, please contact them here:

http://goo.gl/FrP68N

Southern Water is a risk management authority and has the following flood risk management functions:

- To respond to flooding incidents involving their assets;
- To maintain a register of properties at risk of flooding due to a hydraulic overload in the sewerage network;
- To undertake capacity improvements to alleviate sewer flooding problems;
- To provide, maintain and operate systems of public sewers and works for the purpose of effectually draining their operative area;
- To co-operate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions;
- To have a regard to national and local flood and coastal erosion risk management strategies.

PARISH COUNCILS

Parish councils are involved in managing local issues, and the management of local flooding may be one of the problems they help coordinate. They can also be a source of local information about flood risk and are likely to know which areas are prone to flooding

(particularly from local flooding incidents). They may have records of flooding, which may not be recorded by other authorities.

Parish Councils are involved in responding to emergencies and have a consultation role in local planning applications, and can influence how local developments are delivered.

LAND OWNERS

If you own land or property next to a river, stream or ditch you are a riparian owner. Under common law, riparian owners possess rights and responsibilities pertaining to any stretch of watercourse which falls within or follows the boundaries of their property. It is normally presumed that a riparian owner owns land up to the centre line of a non-tidal watercourse where the watercourse itself forms a boundary, even if this is not denoted on the Land Registry plan for the property.

Riparian owners have a duty of care towards their neighbours upstream and downstream. This means they must avoid any action likely to cause flooding of their neighbour's land or property; they are therefore responsible for accepting water from the section of watercourse owned by their upstream neighbour and then transferring this, together with drainage from their own property, to their neighbour immediately downstream.

The ultimate responsibility for the maintenance of a watercourse and its banks always lies with the riparian owner, regardless of whether such works have been carried out by any other Authority at its own expense in the past. Such maintenance works can include clearing obstructions, repairing the banks, and the management of vegetation or trees.

It is important that riparian owners preserve access to the banks of rivers and streams for maintenance and safety purposes. Access to the watercourse should therefore be considered when erecting any fencing, and undergrowth and vegetation on and around the banks should be appropriately controlled.

Further information on riparian rights and responsibilities can be found in the Environment Agency's document 'Living on the Edge' – this can be found at:

http://goo.gl/4Wta5r

If you are a riparian owner and planning works on a watercourse (or in the vicinity of flood defences) you must contact the relevant authority to discuss whether you need formal consent for your works. This is to ensure that you do not increase flood risk or damage watercourses and flood defences. The relevant consenting authority has powers to remove works that are not consented.

If you are not sure whose consent you may require, please contact the Kent County Council Flood Risk team at flood@kent.gov.uk, or phone 03000 414141.

It should be noted that the abstraction of water from (and the discharge of water to) any watercourse is also regulated by the Environment Agency. They should be contacted prior to the commencement of any such activity.

FLOOD AND COASTAL RISK MANAGEMENT INVESTMENT

The government provides an annual grant to invest in flood defence works; this is known as Flood Defence Grant in Aid. The government offers funding to projects based on the outcomes they will deliver. Whilst the number of homes protected from flooding is the primary consideration, the amount of habitat created and other economic benefits are also taken into account. Any risk management authority can apply for funds from this source.

Flood defence schemes which provide a significant reduction in risk to a large number of properties may occasionally be funded in their entirety by FDGIA; however, smaller schemes which provide a smaller benefit will usually require additional contributions from elsewhere to proceed.

Any other body, organisation or person may make a contribution to meet the shortfall. This process has been established by the government to encourage the communities that benefit from these schemes to invest directly in them. This is known as partnership funding.

Each year risk management authorities from each region are invited to submit details of any proposed flood or coastal erosion management works which will require funding over the next five years. The proposals are captured in a report known as the Medium Term Plan (MTP) by the Environment Agency. Each regional MTP is combined into one national plan to give an indication of investment needs across the entire country.

Projects on the MTP are ranked according to the benefits provided divided by the remaining cost (once partnership funding contribution have been taken into account). The highest ranked schemes receive the greatest proportion of government allocation. The lower ranked schemes typically require a greater contribution from other concerned parties.

Figure 2. shows how this mechanism of flood defence funding differs from how flood defence investment was allocated in the past.

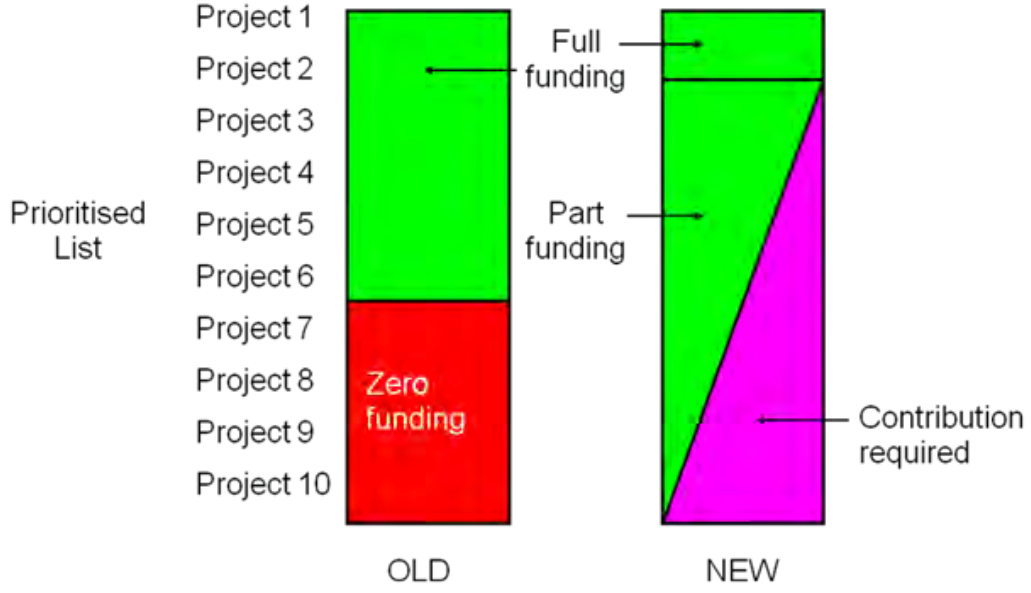


Figure 2. Flood defence investment.

FLOOD RISK MANAGEMENT PLANS AND STRATEGIES

There are a number of flood risk management plans and strategies that affect how flood risk in Canterbury is managed. More detailed information about flood risk management in Canterbury can be found in these documents.

This section aims to give you an overview of the most important of these documents and tells you where to find them.

NATIONAL FLOOD AND COASTAL EROSION RISK MANAGEMENT STRATEGY

The National Flood and Coastal Erosion Risk Management Strategy (the National Strategy) provides a national framework for managing the risk of flooding and coastal erosion in England.

It has been prepared by the Environment Agency with input from Defra, and sets out the objectives and six guiding principles on how flood risk management should be delivered by all risk management authorities in England

The National Strategy can be found here:

http://goo.gl/27nZp0

FLOOD RISK MANAGEMENT PLANS

By law the Environment Agency and Natural Resources Wales must produce flood risk management plans (FRMPs) for each River Basin District. These FRMPs must cover flooding from main rivers, the sea and reservoirs.

Lead Local Flood Authorities must also produce FRMPs for all Flood Risk Areas covering flooding from local sources (surface water, ordinary watercourses and groundwater). LLFAs may either prepare a separate FRMP or contribute to a joint partnership FRMP for the River Basin District.

Kent County Council do not have any Flood Risk Areas under their jurisdiction, but they may contribute to a joint partnership FRMP. Other RMAs can also contribute to developing the joint partnership FRMP for the River Basin District. Such contributions are carried out on a voluntary basis and will result in better co-ordinated flood management.

The preferred approach to completing a FRMP

The preferred approach to FRMPs is for Environment Agency and Natural Resources Wales to prepare joint FRMPs in partnership with others, in particular LLFAs and other RMAs. Information about all sources of flood risk is combined to form a single FRMP. This approach co-ordinates flood risk management planning with river basin management planning under the Water Framework Directive, in particular the statutory consultation on proposed updates of River Basin Management Plans (RBMPs) and draft FRMPs.

LLFAs preparing separate FRMPs must co-ordinate the activities of interested parties with those developing RBMPs in England and Wales.

What FRMPs contain

Flood Risk Management Plans must include:

- a map showing the boundaries of the Flood Risk Area
- the conclusions drawn from the flood hazard and risk maps
- objectives for the purpose of managing the flood risk
- proposed measures for achieving those objectives
- a description of the proposed timing and manner of implementing the measures including details of who is responsible for implementation
- a description of the way implementation of the measures will be monitored
- a report of the consultation
- where appropriate, information about how the implementation of measures under the FRMP and RBMP area will be co-ordinated

A map of the agreed Flood Risk Areas can be found here:

https://goo.gl/Zobkko

'Flood Risk Management Plans (FRMPs): how to prepare them' provides more guidance for RMAs.

https://goo.gl/LzkfUM

Local Flood Risk Management Strategy

Kent County Council's Local Flood Risk Management Strategy (the Local Strategy) sets out a countywide strategy for managing the risks of local flooding; this is defined as flooding from surface water, groundwater and ordinary watercourses. The Local Strategy is prepared by Kent County Council as part of its role as Lead Local Flood Authority. The aims of the local strategy are:

- To coordinate the work of the management authorities to improve the understanding of these risks
- To ensure that we work together to aim to provide effective solutions to problems
- To improve the public's understanding of the risks in Kent and how everyone can play a part in reducing them.

Part of the Local Strategy sets out how KCC prioritises the management of local flooding in the county. The county is divided into areas with similar local flooding issues. These areas are given a policy for the management of this risk according to its complexity. The local flood risk management policies are shown on the map in Appendix 3.

The Local Strategy can be found here:

http://goo.gl/hpw021

Catchment Flood Management Plans

Catchment Flood Management Plans (CFMPs) are produced by the Environment Agency; they set policies for how inland flood risk should be managed within the catchment (coastal flooding is considered in Shoreline Management Plans, see below). Catchment Flood Management Plans pre-date the Flood and Water Management Act and were not

prepared with the input of the Lead Local Flood Authorities (or with the additional data that is now available about local flooding).

Catchment flood management plans (CFMPs) consider all types of inland flooding, from rivers, groundwater, surface water and tidal flooding. Shoreline management plans consider flooding from the sea.

CFMPs also include:

- the likely impacts of climate change
- the effects of how we use and manage the land
- how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs

CFMPs help the Environment Agency and their partners to plan and agree the most effective way to manage flood risk in the future.

Canterbury is in the River Stour Catchment Flood Management Plan. The policies, along with an explanation of what each of the 6 policies mean, are shown on the map in Appendix 4. The River Stour Catchment Flood Management Plan can be found here:

http://goo.gl/JdlEN8

Shoreline Management Plans

Shoreline Management Plans (SMPs) set policies for the management coastal flooding and erosion risk for sections of the coastline. They are developed by Coastal Groups, which are groups of appropriate risk management authorities that coordinate coastal works regionally. Shoreline Management Plans identify the most sustainable approach to managing the coastal flood and erosion risks to the coastline for three epochs:

- short-term (0 to 20 years)
- medium term (20 to 50 years)
- long term (50 to 100 years)

Canterbury is in the Isle of Grain to South Foreland Shoreline Management Plan. The policies for the first epoch can also be found on the map in Appendix 4. The Isle of Grain to South Foreland Shoreline Management Plan can be found here:

http://goo.gl/QcahFH

Surface Water Management Plans

Surface Water Management Plans (SWMPs) are prepared by Kent County Council in partnership with the other Risk Management Authorities. They provide an overview of local flood risk for the study area (despite their name) and may cover the risks from other sources of flooding, including where there are combined risks of flooding..

Surface water management plans can vary in scope and detail. Some provide an overview of historic flooding and a general review of existing information. Other surface water management plans use complex rainfall modelling to determine the flood risk from a range of storm durations and intensities to quantify the risks (usually in high risk areas).

These plans identify the areas of significant local flood risk and seek to identify options to address the identified risks.

There are two surface water management plans in Canterbury district. One provides an overview of the historic local flood risk in whole district; this can be found here:

http://goo.gl/AxipCR

The results of the modelling undertaken to inform the Canterbury Surface Water Management Plan is shown in Appendix 8.

We have also undertaken a modelling exercise for the middle of Whitstable to investigate the risks to and from the Gorrell Stream, the results of which are shown in Appendix 5.

Strategic Flood Risk Assessment (SFRA)

Strategic Flood Risk Assessments (SFRAs) are prepared by Local Authorities and are primarily used to influence local planning policy decisions to ensure future development in the borough are appropriately located and sustainably constructed. They provide a general assessment of the flood risk from all sources across a borough (tidal, fluvial, surface water, groundwater, impounded water bodies and sewers) and should take full account of the likely impact of predicted climate change.

The Canterbury SFRA is available on request from Canterbury City Council. A summary can be read here:

http://goo.gl/6kKgCB

River Basin Management Plan

River Basin Management Plans are a requirement of the Water Framework Directive; they provide an overview of how water framework directive objectives (achieving the protection, improvement and sustainable use of the water environment) will be met for the water bodies in the river basin that the plan covers. They are not flood risk management documents, but they can influence how rivers and other water bodies are managed.

Canterbury is in the South East River Basin Management Plan, which can be found here:

http://goo.gl/7s6U5Q

UNDERSTANDING FLOOD RISK

There are a number of maps available that show the risk of flooding to areas from various sources. This section explains what the easily available maps are and what form of flooding they show.

FLOOD RISK MAPPING

Not all flood risk is nationally modelled and mapped. For instance, the flood risk arising from ordinary watercourses has not been specifically investigated and depicted on a national scale. It is also important to note that many types of flood map only include one type of flood risk. For example, a flood map of the River Stour in Canterbury would not include the potential for sewer flooding that might occur at the same time (although this does not mean to say that Canterbury is necessarily at risk from this combination of flooding).

Combining the different types of flooding into one model (and one map) is very difficult. The mechanisms involved in combining the different types of flooding are extremely complex and the scales are different, consequently it is not easily computable in one model. However, in some areas where a significant risk from combined sources of flooding has been identified, KCC has investigated flooding collectively and produced mapping to depict this within their Surface Water Management Plans. Unfortunately it is not yet possible to produce a map to show this risk for the whole county.

HOW FLOOD RISK IS EXPRESSED

The terms Annual Exceedance Probability (AEP) and Return Period are common ways to describe the likelihood of a flood of a certain magnitude happening in any given year.

An AEP is the *probability* of a certain size of flood occurring in any one year. A 1% AEP flood event has a 1% (or 1 in 100) chance of occurring in any one year.

A Return Period is a way of expressing how often a flood of a given magnitude might reoccur over a long period of time. For example, a flood described as having a 1 in 100 year return period is likely to occur, on average, ten times every 1000 years (or once every 100 years).

A 1 in 100 year Return Period flood and 1% AEP flood event are different terms to describe the same event.

It is important to note that while a 1% AEP flood may occur once every 100 years on average, the probability of a flood of that size occurring in any particular year does not change. If a 1% AEP flood was recorded this year, the probability of another flood of that magnitude being recorded in the following year (or any other subsequent year) would still be 1%. Accordingly, it is statistically possible to have several 1% AEP floods over a period of 100 years. Similarly, it is equally statistically possible have a period of 100 years without a single 1% AEP flood being recorded.

Table 2. Annual Exceedance Probabilities and their equivalent Return Periods.

AEP (%)	Equivalent return period (yrs)	Magnitude
0.1	1000	Less frequent/more extreme events.
1	100	
1.33	75	
2	50	
3.33	30	
5	20	
10	10	
20	5	
50	2	
100	1	More frequent/less extreme events.

FLOOD MAP FOR PLANNING

The Flood Map for Planning is the Environment Agency's original format for flood mapping and depicts the three flood zones used to define areas of risk of flooding from rivers and the sea. It is important to note that these maps show the predicted extent of flooding **if there were no defences or buildings present** to affect the flow of water into and through the natural floodplain.

The three flood zones are:

Flood Zone 3

Flood Zone 3 is the area deemed to be at the highest risk from flooding; it is sub-divided into two categories:

Flood Zone 3a - In the absence of defences, this is an area that would be considered to be at risk from:

- the sea during a flood event that has an AEP of 0.5% (i.e. a Return Period of 200 years)
- a river during a flood event that has an AEP of 1% (i.e. a Return Period of 100 years)

Flood Zone 3b – This zone is also known as the functional floodplain. The functional floodplain is defined as the area that would be susceptible to flooding from rivers or the sea during any event up to and including the 5% AEP event (the 1 in 20 yr event, or more frequently). Unlike the other Flood Zones, Zone 3b takes full account of any defences which may offer protection to the area. **The functional floodplain is the area that would flood despite the presence of defences.**

Flood Zone 2 - This shows the additional extent of an extreme flood from rivers or the sea. In the absence of defences, these outlying areas would be affected by a major flood, with an AEP of up to 0.1% (i.e. an area at risk from flooding from an event with a 1000 year Return Period). This is also known as the Extreme Flood Outline.

Flood Zone 1 – This shows all areas not covered by the other two flood zones, it is an area considered to be a negligible risk of flooding from rivers or the sea. However, areas in this flood zone may still be at risk from other forms of flooding.

The primary use of this map is for planning purposes to ensure that new developments can take account of the risk of flooding as they are being planned. It is important to understand that there remains a flood risk, even if there are defences that protect the area from flooding. Flood defences can only reduce the risk from flooding. No matter how well constructed a flood defence may be, there will always be a risk of its overtopping or failure. This residual risk must be taken into account when considering new development to ensure it is appropriately constructed, and to ensure the users, inhabitants or emergency services are not placed in unnecessary danger in the unlikely event of flooding.

The Flood Map for Planning is available on the Environment Agency's website:

http://goo.gl/8YyW8k

The Environment Agency are statutory consultees for all development at risk of flooding from rivers and the sea, defined as Flood Zones 2 and 3. They should be consulted as early in the development planning process as possible.

National Flood Risk Assessment

The Environment Agency's National Flood Risk Assessment (NaFRA) mapping provides an assessment of the likelihood of flooding from rivers and the sea during an extreme 0.1% AEP event. Unlike the Flood Map for Planning (as described above), the NaFRA mapping **takes full account of the flood defences protecting an area**. It considers the likelihood of the defences being breached or overtopped during a flood event. This likelihood depends on the type of defence, its location, its condition and the designed standard of protection.

The mapped flood risk is presented as a grid of 50 m^2 squares. The likelihood of flooding is determined for each 50m^2 within the entire area of the Extreme Flood Outline (i.e. Flood Zone 2).

Each 50m^2 area within the Extreme Flood Outline is then assigned one of four categories:

- High – At risk from an event with an AEP of 3.3% or greater (i.e. at risk from floods with a Return Period of 30 years, or more frequently)
- Medium – At risk from an event with an AEP of less than 3.33% AEP but greater than or equal to 1% (i.e. at risk from flooding events with a Return Period of between 30 years and 100 years)
- Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1% (i.e. at risk from flooding events with a Return Period of between 100 years and 1000 years)
- Very Low – At risk from events with an AEP of less than 0.1% (i.e. at risk from floods with a Return Period of 1000 years or greater).

The NaFRA mapping is generally considered to present a more accurate representation of the flood risk to an area than the Flood Map for Planning provides owing to its incorporation of existing flood defences.

PROPERTIES AT RISK

In the Canterbury district, there is a total 8322 dwellings in areas considered to be at risk from tidal or fluvial flooding (this figure is taken from the Environment Agency's NaFRA mapping, which takes the presence of flood defences into account); 5564 of these are at a medium-high risk of flooding.

Table 3 (below) outlines the level of this risk within each parish.

Table 3. Dwellings at tidal/fluvial flood risk in Canterbury.

Parish	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Adisham	0	0
Barham	90	109
Bekesbourne with Patrixbourne	51	55
Bishopsbourne	52	59
Bridge	152	171
Canterbury	670	1549
Chartham	132	244
Chestfield	137	168
Chislet	68	82
Fordwich	145	150
Hackington	0	0
Harbledown and Rough Common	0	0
Herne and Broomfield	3	4
Hoath	4	6
Ickham and Well	19	31
Kingston	8	8
Littlebourne	74	92
Lower Hardres	0	0
Petham	13	13
St Cosmus and St Damian in the Blean	15	23
Sturry	185	203
Thanington Without	36	55
Upper Hardres	0	0

Waltham	0	1
Westbere	0	0
Whitstable and Herne Bay	3594	5160
Wickhambreaux	116	133
Womenswold	0	0

Surface Water Mapping

The Environment Agency's surface water flood mapping gives a broad indication of the areas likely to be at risk from surface water flooding. These are areas where surface water would be expected to flow or pond if the capacity of the drainage networks and ground were exceeded.

The Flood and Water Management Act 2010 defines surface runoff, and the type of flooding shown by the updated Flood Map for Surface Water fits with the definition given within the Act. It shows the extent of flooding that could occur from any form of precipitation (including melted snow), which:

- Is on the surface of the ground (whether or not it is moving), and
- Has not yet entered a watercourse, drainage system or public sewer.

In 2013, the Environment Agency produced the updated Flood Map for Surface Water (uFMfSW). The aim of the uFMfSW is to provide the best single source of information on surface water flooding for England and Wales which includes local information and knowledge. It is a separate, single, mapping product that draws together:

- The Environment Agency's national scale surface water flood mapping, and
- Appropriate locally produced mapping from LLFAs.

The uFMfSW should not be used to identify the flood risk to individual properties, and should only serve to give a more general indication of an area's susceptibility to surface water flooding.

PLANNING AND SUSTAINABLE DRAINAGE (SUDS)

Planning authorities must take flood risk from all sources into consideration when they are preparing their local development plans or during their determination of planning applications. This requirement is clearly laid out in Section 10 of the National Planning Policy Framework (NPPF) and within its associated Technical Guidance.

Permission for new development or redevelopment of sites in areas at risk from flooding will not necessarily be withheld, but the planning authorities have a duty to ensure flooding is materially taken into account within any development proposal. Applications are likely to be refused if it cannot be demonstrated that the identified risks can be appropriately managed.

Sustainable drainage systems (SuDS) are an important flood risk management measure to consider when advancing development plans; they aim to manage surface water runoff from developments in a natural way by replicating natural processes and should be considered from the outset and included wherever possible.

Since 15 April 2015, the provision of sustainable drainage within new development has been a material consideration in the planning process. There is an associated requirement for Kent County Council to be consulted by each of the county's twelve Local Planning Authorities whenever they receive an application for major development within their districts.

We will also be consulted on applications for minor development in areas where there are known drainage problems.

KCC'S STATUTORY CONSULTEE ROLE

Kent County Council are required to provide technical advice and guidance on the surface water drainage strategies, designs and maintenance arrangements put forward by developers for any new major development. Existing planning policies, National Planning Practice Guidance, and the recently published national '*non-statutory technical standards for the design, maintenance, and operation of SUDS*' will provide the guidance upon which our consultation responses will be based.

As statutory consultees, we will be seeking to assist the delivery of requirements of the Government's National Planning Policy Framework (NPPF). This framework promotes sustainable development and makes specific recommendations for the incorporation of SuDS into new development.

This role fits with our existing role of Lead Local Flood Authority (LLFA) for the county, in which we develop a strategy to manage local flooding (flooding from surface water, groundwater and ordinary watercourses).

Major development

Major development is defined in planning as any development involving any one or more of the following:

a) the winning and working of minerals or the use of land for mineral-working deposits;

b) waste development;
c) the provision of dwellinghouses where -
    i. the number of dwellinghouses to be provided is ten or more; or
    ii. the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);
d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or
e) development carried out on a site having an area of one hectare or more.

(The Town and Country Planning (Development Management Procedure) (England) Order 2010).

Sustainable Drainage Systems

Kent County Council encourages the use of Sustainable Drainage Systems (SuDS) to manage surface water in a sustainable way in all development. For all new major development it should be demonstrated that:

- an appropriate SuDS system will be incorporated (unless it is clearly demonstrated and agreed that they would inappropriate),
- the minimum standards of operation proposed by the applicant are appropriate,
- that there are clear arrangements in place for the ongoing maintenance of any SuDS scheme over the lifetime of the associated development (through the use of planning conditions or planning obligations where appropriate).

Further information:

The National Planning Policy Framework can be found at:

http://goo.gl/KlbX9p

The National Planning Policy Framework Technical Guidance can be found at:

http://goo.gl/SMEiOV

The associated NPPF guidance related to surface water management can be found at:

http://goo.gl/W4ePfy

Further information on masterplanning for SuDS can be found at:

http://goo.gl/wMSLcE

The non-statutory technical standards for the design, maintenance, and operation of SUDS can be found at:

http://goo.gl/5pcA7f

EMERGENCY PLANNING

PLANNING FOR AND MANAGING FLOODING EMERGENCIES

Severe weather and any associated flooding can lead to an emergency being declared. It is important that plans are maintained to outline the actions that should be taken to both reduce the likelihood of an emergency occurring, and to reduce its impact far as possible if an emergency does occur. Regular training and exercising supports this planning. The Civil Contingencies Act 2004 designates response agencies as either Category 1 or 2 responders, and sets out their roles and responsibilities.

Category 1 responders are known as 'core responders', and they include the emergency services and local authorities. Category 2 responders are 'key co-operating responders' acting in support of Category 1 responders; they include utility companies and transport organisations.

There are a number of bodies responsible for planning for and responding to a flood emergency, their roles and responsibilities are summarised below:

CATEGORY 1 RESPONDERS

Kent County Council

- Coordinate emergency support within their own functions.
- Establish multi-agency command and control systems (County Emergency Centre).
- Coordinate emergency support from the voluntary sector.
- Mobilise and chair Severe Weather Advisory Group.
- Mobilise military aid to the civil community.
- Liaise with central and regional government departments.
- Liaise with essential service providers.
- Open and support survivor reception and rest centres.
- Manage the local transport and traffic networks.
- Mobilise social care interventions.
- Provide emergency assistance.
- Coordinate the recovery process.
- Provide advice and management of public health.
- Assist with business continuity.

Canterbury City Council

- Deal with emergencies on ‘non main rivers'.
- Establish multi-agency command and control systems (District Emergency Centre).
- Liaise with central and regional government departments.
- Co-ordinate the response to any homelessness issues which may arise.
- Deal with environmental health issues, such as contamination and pollution.
- Coordinate emergency support within their own functions.

Kent Police

- Save life.
- Establish multi-agency command and control systems.
- Coordination and communication between emergency services and organisations providing support.
- Coordinate the preparation and dissemination of public warning and informing.
- Establish and maintain a Casualty Bureau.

Kent Fire and Rescue Service

- Save life rescuing people and animals.
- Carry out other specialist work, including flood rescue services.
- Where appropriate, assist people where the use of fire service personnel and equipment is relevant.

South East Coast Ambulance Service

- Save life.
- Provide treatment, stabilisation and care at the scene.

Environment Agency

- Issue Flood Alerts and Warnings and ensure systems display current flooding information.
- Provide information to the public on what they can do before, during and after a flood event.
- Work with professional partners and stakeholders and respond to requests for flooding information and updates.
- Mobilise and chair Severe Weather Advisory Group.
- Receive and record details of flooding and related information.
- Operate water level control structures within its jurisdiction and in line with permissive powers.
- Flood event data collection.
- Arrange and take part in flood event exercises.
- Respond to pollution incidents and advise on disposal.
- Assist with the recovery process, for example, by advising on the disposal of silt, attending flood surgeries.

Category 2 Responders

Utility providers

- Attend emergencies relating to their services putting life at risk.
- Assess and manage risk of service failure.
- Assist with the recovery process, including the management of public health considerations.

KENT RESILIENCE FORUM

The Kent Resilience Forum (KRF) is one of a number of Local Resilience Forums (LRFs) that have been set up across England. The overall aim of an LRF is to ensure that the various agencies and organisations plan and subsequently work together to ensure a co-ordinated response to any emergency that could have a significant impact on any community.

LRFs are partnerships made up of a number of different organisations and agencies (although they are not legal organisations in themselves). The areas covered by a LRF align with the local police area boundaries.

The various agencies that form the KRF work together in a range of areas including:

- Assessing risks across the county and developing the Kent Community Risk Register
- Planning for emergencies
- Planning for Business Continuity Management
- Producing multi-agency plans
- Carrying out training and exercising
- Warning and informing the public - before, during and after emergencies.

Member organisations of the LRFs are the Category 1 and 2 responders (as outlined above). The KRF is required to meet at least every six months.

Further information:

The National Flood Emergency Framework for England can be found at:

http://goo.gl/vkeV3O

Kent County Council's Flood Response Plan can be found at:

http://goo.gl/y8dcci

Canterbury City Council's Major Emergency Plan can be found at:

http://goo.gl/vgEaX2

SANDBAGS

The City Council believes that everyone, both householders and people with business properties etc. should take their own precautions to protect their own property. In order to encourage this attitude a list is maintained of local suppliers where sand and sandbags can be bought in small quantities as well as a list of alternative means of flood protection such as flood boards and other proprietary systems. This information is available to the public on request, free of charge.

If homes or businesses are threatened by flooding the City Council will use its best endeavours to supply, deliver and place sandbags, but only on the understanding that the City Council can give no guarantee that any such delivery will be in sufficient time or in sufficient quantity to prevent or even to reduce damage to property. The City Council will not accept any liability, whatever the circumstances, for failure to supply sandbags or for their late delivery.

The City Council will maintain a supply of filled sandbags in readiness. These will be held at the Serco depot in Canterbury, and at Whitstable Harbour. These will be replaced if stocks become diminished during a flood event.

Some local Parishes maintain stocks of filled sandbags for rapid response to residents. These stocks have been supplied free of charge by the City Council and while it is the responsibility of the Parish Councils to maintain them in good condition the City Council will, if requested, help keep stocks up to these numbers and will supply further sandbags when these stocks are exhausted.

Sandbags are supplied and delivered free of charge to protect people's homes and they will also be supplied and delivered to protect business premises and the like but priority will always be given to domestic premises. The City Council reserves the right to charge for the supply and delivery of sandbags to business premises.

The Council will not supply sandbags to protect garages, sheds, greenhouses, outbuildings and the like nor for land generally including gardens, allotments, agricultural land, recreational land, parks, private driveways, paths etc.

Delivery will generally be direct to the address of the person asking for help, but may also be made to a central point for residents to collect and put in place themselves.

The City Council will, wherever possible, seek to prioritise delivery of sandbags by only supplying them after an assessment of the situation has been carried out by an appropriate member of the City Council's engineering staff and their authorisation has been given for distribution together with his recommendations of the most effective way of deploying limited resources. However the scale or urgency of an emergency could overwhelm the City Council's manpower resources and should that happen sandbags will be delivered to areas of known flood risk without the necessity of a prior assessment of each situation by Council engineers.

Experience has shown that most houses can be adequately protected by about 10 sandbags, and requests for greater numbers will not normally be accepted except in exceptional circumstances.

Sandbags will not be collected after the event and householders will be advised to keep them for use in future events. However if circumstances at a particular property require significantly more than the usual number of sandbags to be deployed then they will, on request, be collected up by the Council once the threat of flooding has disappeared.

Sandbags which have been placed in strategic positions and in public areas such as highways will be collected by the Council.

Sandbags will not be issued other than during an emergency. Should a request be received Council staff will advise the public about private suppliers in the area.

PERSONAL FLOOD PLANNING AND ASSISTANCE

The Government has produced a guide on what to do before, during and after a flood. It features advice such as how to check whether you are at risk of flooding, checklists to help you prepare and practical advice should flooding occur.

According to this advice, you should initially:

- Find out if you're at risk,
- Make a Flood Plan,
- Improve your property's protection,
- Get insurance,
- Get help during a flood,
- Get help after a flood.

Further guidance on each of these steps is available at:

http://goo.gl/qPRnP1

FLOOD ADVICE FOR BUSINESSES

The Government has also produced advice and guidance specifically aimed at businesses at risk from flooding. This guidance can be found at :

http://goo.gl/oyrbfA

FLOOD WARNINGS

The Environment Agency provides a free Flood Alert and Warning service in many areas at risk of flooding from rivers or the sea.

Flood warnings give advanced notice of potential flooding by phone, text, email, pager or fax.

To find out if you live within a Flood Warning area and to sign up, please visit http://goo.gl/hEXdZZ or call **0345 988 1188.**

The Environment Agency's live Flood Warning map identifies areas where Flood Alerts, Flood Warnings or Severe Flood Warnings are in force. The map is updated with information from the Flood Warning service every 15 minutes; it can be found here: http://goo.gl/hahByd

It should be noted that the Environment Agency's Floodline Warnings Direct service only pertains to flooding from rivers and the sea.

Table 4. Flood Alert and Warnings

Symbol	Status	Action
	A Flood Alert means that flooding is possible and that you need to be prepared	Residents should make some low impact preparations (e.g. move small / valuable items upstairs) check travel plans and remain vigilant.
	A Flood Warning means that flooding is expected. You should take immediate action and not wait for a severe flood warning.	Put in place home flood defences. Move valuables and people upstairs. Turn off utilities.
	A Severe Weather Warning means that there is severe flooding and danger to life.	These are issued when flooding is posing significant risk to life or disruption to communities.
There is no symbol for this stage.	Warnings no longer in force	This message will be issued when no further flooding is currently expected in your area.

KEY CONTACTS

Main sewers (foul and surface water)	
Southern Water	**0845 278 0845**
	customerservices@southernwater.co.uk
Private connections to the main sewer	
Householder's responsibility.	
Domestic drainage in Council-owned properties	
Serco	**0800 834 959**
Main rivers	
Environment Agency	**08708 506 506** (8pm to 6pm weekdays)
	0800 80 70 60 (24-hour emergency hotline)
	enquiries@environment-agency.gov.uk
Ditches, watercourses and land drainage	
Kent County Council	**03000 414141**
	flood@kent.gov.uk
Canterbury Council (Dan Simmons)	**01227 862 450**
	flooding@canterbury.gov.uk
River Stour (Kent) Internal Drainage Board	**01227 462377**
	enquiries@riverstouridb.org.uk
Highway flooding, including blocked gullies (kerbside gratings)	
Kent County Council Highways	**03000 41 81 81**
	http://goo.gl/9qgjEe
Pollution	
Canterbury City Council	**01227 862 202**
	nuisance@canterbury.gov.uk
Environment Agency	**0800 80 70 60** (24-hour emergency hotline)

WHITSTABLE

In the Whitstable area there is a total of 4438 properties at risk from rivers or the sea (taking the existing defences into account); 3337 of these are at medium to high risk.

Table 3. Number of dwellings at risk from fluvial/tidal flooding in Whitstable

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Chestfield and Swalecliffe	237	333
Gorrell	222	523
Harbour	2419	2691
Seasalter	361	769
Tankerton	98	122

Whitstable is situated on Kent's Northern coast where the mouth of the Swale meets the North Sea. The western-most extent of the town is constructed on low-lying former marshland, with the land rising towards Tankerton to the East. The entire area is underlain by impermeable London clay.

There are three main rivers that flow through the Whitstable area towards the sea. These watercourses are the Gorrell Stream, the Swalecliffe Brook and the Kite Farm Ditch; they are collectively known as the Oyster Coast Brooks (together with the Plenty Brook and the Westbrook in Herne Bay).

All of the Oyster Coast brooks have relatively small catchment areas and are flashy in nature; this means they tend to respond quickly to rainfall events as a result of the relative impermeability of the underlying clay and topography of their catchment areas.

There is a significant risk of coastal flooding in Whitstable. However, Whitstable is protected from coastal flooding by defences built to a 1 in 200 year standard. These consist of a managed beach in front of raised sea-walls with rear wave walls. They are owned and maintained by Canterbury City Council who should be contacted if further information is required (please see previous Key Contacts Section)

Owing to the substantial and well-maintained defences that protect the town from coastal flooding, Whitstable's greatest risk of flooding is considered to be from a combined high tide and extreme rainfall event. High spring tides and storm surges can prevent the three rivers from freely discharging to the sea. Any extreme rainfall event that coincides with this tide-locking would then quickly drain to the rivers, where their inability to discharge could result in combined surface water and fluvial flooding in the lowest lying parts of the town centre.

The largest risk of flooding in the Whitstable area is from the Gorrell Stream. It runs through the town via a combination of culverted and maintained open channels. The lower reaches are entirely culverted and the watercourse outfalls to the sea by gravity through Southern Water's Gorrell Tank into the harbour or is pumped out to sea when the gravity outfall is tide locked.

The detailed surface water model results and NaFRA mapping for Whitstable (which shows the areas at risk from flooding with the defences in place) are shown in Appendix 5.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012): Section 3.4
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/3OHSZn)

Planned flood defence works in the Whitstable area

A major scheme to improve the Whitstable flood defences was completed in 2006.

A further scheme to improve the protection provided by the Whitstable Harbour South Quay flood defences will commence in September 2015.

Kent County Council and the Environment Agency are investigating options to reduce the risk from flooding from the Gorrell Stream throughout Whitstable. Detailed computer modelling has been undertaken, and various options are being considered.

Herne Bay

In the Herne Bay area there is a total of 890 properties at risk from rivers or the sea (taking the existing defences into account), 394 of which are at medium to high risk.

Table 4. Number of dwellings at risk from fluvial/tidal flooding in Herne Bay

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Greenhill and Eddington	50	78
Heron	189	575
Reculver	0	8
West Bay	155	229

Herne Bay lies to the East of Whitstable on the North Kent Coast. The area is predominantly underlain by the impermeable London Clay. Further East, towards the River Wantsum, the ground becomes more permeable, but the majority of the urban area sits on clay.

There is a significant risk from tidal flooding in Herne Bay. However, there are substantial and well-maintained coastal defences along the town's entire frontage which significantly reduce the risk. In 2013 improvement works were completed to these defences to ensure that Herne Bay was protected from tidal events up to a 0.5%AEP (i.e. a 1 in 200 year standard of protection). This was achieved through the raising of the existing sea-wall, the construction of a new wall and the installation of new flood gates. Additional timber groynes were also installed to assist with the retention of beach material.

Herne Bay is also protected from significant damage by wave action by the Neptune Arm, a large rock breakwater constructed in 1992.

Following these improvements, it is now considered that greatest threat from flooding to Herne Bay arises from effects of tide locking or the failure of pumps on the surface or combined sewer network. Southern Water have made various improvements to their network to reduce the risk; these include the construction of new, larger or auxiliary sewers, and new or improved pumping stations. This has resulted in a system that should not experience flooding in anything but extreme rainfall events or pump failure.

The Plenty Brook, a predominantly rural main river, has its source near Herne, towards the south of the town. It flows in a northerly direction and passes through a culvert under the railway. After the railway the watercourse is entirely culverted through the town until it reaches its outfall to the sea. The culverted section is 2-3m^2 in cross-sectional area and is designated a Southern Water sewer.

The culverted watercourse and associated connecting sewers are of limited capacity and have historically caused serious problems in the Eddington area. After serious flooding in 2000, various storage structures and attenuation features were created up-stream of the town to alleviate the pressure on the sewer network and to generally increase the capacity of the system.

Since these improvements were completed the town has experienced both less frequent and less severe flooding. It is now considered that the town is protected from events with an AEP of approximately 4% (i.e. around a 25 year standard of protection).

The Westbrook is also largely rural in nature and poses a risk to the western end of the town, particularly when tide-locked and unable to freely discharge.

The NaFRA mapping for Herne Bay (which shows the areas at risk from flooding with the defences in place) is shown in Appendix 6.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012): Section 3.5
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/hnjtPF)

Planned flood defence works in the Herne Bay area

Further improvements to raise the rear wall sea defences just west of the Pier at Herne Bay have just been completed.

HERNE AND STURRY

In the Herne and Sturry area there is a total of 445 properties at risk from rivers (taking the existing defences into account), 405 of which are at medium to high risk.

Table 5. Number of dwellings at risk from fluvial/tidal flooding in Herne and Sturry

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Herne and Broomfield	3	4
Marshside	72	88
Sturry North	1	3
Sturry South	329	350

The ward of Herne and Sturry is situated to the south of Herne Bay and to the North East of Canterbury City. The area is predominantly underlain by impermeable London Clay, with some deposits of Head Brickearth adjacent to the Plenty Brook. Towards the east of the ward, the geology changes from London Clay to the slightly more permeable tertiary deposits of the Thanet, Oldhaven and Woolwich beds.

The Plenty Brook rises in Herne and flows north towards the sea through Herne Bay; however, it isn't considered to pose a threat to the village of Herne.

The area around Marshside and the North Stream is particularly low-lying and can be affected by both fluvial and tidal flooding. During flood events, water can come out of the streams and watercourses that drain the area and then spread slowly across the flat, low land. The area of inundation is quite large, affecting mainly agricultural land; however, during extreme flooding events, a number of residential properties are potentially susceptible to flooding.

The Sarre Penn flows through the ward, entering the channel of the River Wantsum to the east. Together with the Stour, the River Wantsum formed the Wantsum Channel, a watercourse which historically separated the Isle of Thanet from the mainland of Kent. This channel has almost completely silted up and now largely consists of an artificial drainage network and well managed farm land.

The historic town of Fordwich lies to the south of the ward and lies at the tidal limit of the River Stour. Fordwich experienced flooding from the River Stour in 2000/1, and again in early 2014.

The NaFRA mapping for Herne and Sturry (which shows the areas at risk from flooding with the defences in place) is shown in Appendix 7.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012): Section 3.5
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/3OHSZn)

Planned flood defence works in the Herne and Sturry area

An options review has been undertaken for Fordwich to identify potential flood risk reduction schemes. Enhanced pioneering work was undertaken in 2014 (a programme of

river maintenance and undergrowth/tree removal), with a programme of dredging due to begin in Oct 2015.

CANTERBURY CENTRE

In the Canterbury City area there is a total of 1603 properties at risk from rivers (taking the existing defences into account), 706 of which are at medium to high risk.

Table 6. Number of dwellings at risk from fluvial/tidal flooding in Canterbury City

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Northgate	74	375
St. Stephens	151	325
Westgate	445	847
Wincheap	36	56

The historic city of Canterbury lies in the centre of the District between the Chalk of the south and the London Clay of the north. The geology of the central region is dominated by the often clayey Thanet Sand Formation, which is overlain by superficial deposits of alluvium. Correspondingly, the Great Stour which follows the central geological band, receives much of its input in the District from small streams and groundwater.

The Great Stour runs through Canterbury and is managed to keep the risk from flooding as low as possible Canterbury City Council monitor water levels are operate sluice structures throughout the city to control water levels on the Great Stour.

Mapping identifies that a number of areas of Canterbury are at risk of deep (>0.3m) ponding of surface water. The areas which are least connected with flooding from the River Stour are St Dunstan's, St Stephen's, Hales Place, St Martin's and Martyr's Field. Please see Appendix 8 for the detailed surface water flood risk map.

The city ranks first in England in terms of the number of scheduled monuments at risk of flooding (9 monuments) and 13th in terms of the number of listed buildings at risk in a 1% AEP event (3 listed buildings).

Portions of Canterbury City are also identified as being potentially at risk from groundwater flooding, with the band of susceptibility broadly following the Great Stour river valley.

Like Whitstable and Herne Bay, Canterbury City is served by a combined sewer network. Flooding has occurred from the sewer system in the city (for example, along St Thomas Hill leading down from the north into St Dunstans).

Within Southern Water's Sewer Incident Report Forms (SIRF) database, all locations of internal property flooding from the combined sewer network are located in the city (except for one in Blean). Instances of sewer flooding further into the city have often been linked with high levels in the Great Stour.

The city of Canterbury is therefore at a relatively high risk of flooding from surface water and groundwater. Flooding from all of these sources has been recorded in the recent past (2000/1, 2002 and 2013/14). However, flooding from these sources has not occurred on

the same scale that has been experienced elsewhere in the District recently (e.g. Whitstable and Herne Bay). Instead, the flooding which has occurred is largely around the northern perimeter of the city (from Harbledown around to Broad Oak) and is connected with non-functioning land drains, poorly maintained ditches and unchecked overland flow across grass hillsides.

The under-capacity of the sewer system is understood to be a contributory factor to the problems experienced around the perimeter of the city, and linked to the very old combined system found in the oldest parts of the urban area.

However, the risk of flooding from the sewers across the city is considered to be generally low, and in 2011 Southern Water completed a £12 million project to increase the capacity of the wastewater infrastructure in Canterbury. These improvement works will help reduce the scale and impact of any existing problems and enable the city's infrastructure to be capable of accommodating the discharges from future development.

The work has included:

- The construction of an underground storm storage tank in Kingsmead Road and the construction of an above ground storm water storage tank at Canterbury Wastewater treatment Works; combined they can accommodate 3,400,000 litres of storm water during periods of intense rainfall (the equivalent capacity of 1.36 Olympic swimming pools).
- A new pumping station in Vauxhall Road and 0.65 km sewer to transfer the wastewater from the Kingsmead tank to the Canterbury Treatment Works.

Once the heavy rainfall subsides, the water from the tanks will be put back into the system for treatment at Canterbury Wastewater Treatment Works before it is eventually returned to the Great Stour.

Drainage experts at Canterbury City Council suggest that the importance of the city centre and the Cathedral mean that road gullies and drains are regularly cleared and this may alleviate a proportion of the surface runoff risk.

The detailed surface water model results and NaFRA mapping for Canterbury City (which shows the areas at risk from flooding with the defences in place) are shown in Appendix 8.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012) Section 3.7
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/3OHSZn)

Planned flood defence works in the Canterbury City area

Approximately £7million has been bid for through the Medium Term Plan process for the investigation, design and construction of a flood storage area in-between Ashford and Canterbury. This will potentially reduce the risk from fluvial flooding to the town and the surrounding area, but still requires further investigation and being granted funding.

To date, a modelling investigation has been undertaken to look at the feasibility of several options but this requires further investigation to how groundwater impacts any potential scheme in this area. Work is currently being undertaken to complete a study to determine the technical, financial and environmental viability of the scheme. This work will form the basis of a business plan.

CANTERBURY WEST

In the Canterbury West area there is a total of 281 properties at risk from rivers (taking the existing defences into account), 160 of which are at medium to high risk.

Table 7. Number of dwellings at risk from fluvial/tidal flooding in Canterbury West

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Blean Forest	15	23
Chartham and Stone Street	145	258
Harbledown	0	0

The Canterbury West ward covers a 91km^2 area, stretching from Blean in the north to Waltham in the south.

Blean has been identified as an area where drainage problems often occur. Canterbury's SFRA suggests that these problems arise from surface water being unable to naturally drain owing to a perched water table which sits on top of the underlying London Clay. The SFRA also suggests that the maintenance of the drainage infrastructure has been historically poor.

Recorded incidents of flooding are connected with the highway drainage and the combined sewer; Southern Water have undertaken some improvement works, but the management of surface water in this area remains difficult and should be a key consideration when any development proposals are being prepared.

The Petham Bourne is a groundwater fed ephemeral stream which runs in a northerly direction through the ward to Shalmsford Street where it joins the Great Stour. The Petham Bourne's channel is a poorly defined and ordinarily dry chalk valley. It flows infrequently, with the most recently observed flows being in 1930, 2000/1 and 2013/14.

The railway to the south of the Stour in Shalmsford Street was flooded by the Petham Bourne in 2000/1and again in 2013/14. Canterbury's SFRA states that properties have also been affected; this is most likely from a combination of fluvial flooding from the Great Stour and groundwater activation of the Petham Bourne and/or local springs.

The Great Stour flows east, bisecting the ward before entering the City of Canterbury. It poses a risk from fluvial flooding to the low lying areas of Shalmsford Street, Thanington and Chartham.

The NaFRA mapping for Canterbury West (which shows the areas at risk from flooding with the defences in place) is shown in Appendix 9.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012) Sections 3.2 and 3.3
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/3OHSZn)

Planned flood defence works in the Canterbury West area

Approximately £7million has been bid for through the Medium Term Plan process for the investigation, design and construction of a flood storage area in-between Ashford and Canterbury. This will potentially reduce the risk from fluvial flooding to the town and the surrounding area, but still requires further investigation and being granted funding.

To date, a modelling investigation has been undertaken to look at the feasibility of several options but this requires further investigation to how groundwater impacts any potential scheme in this area. Work is currently being undertaken to complete a study to determine the technical, financial and environmental viability of the scheme. This work will form the basis of a business plan.

CANTERBURY SOUTH EAST

In the Canterbury South East area there is a total of 658 properties at risk from rivers or the sea (taking the existing defences into account), 562 of which are at medium to high risk.

Table 8. Number of dwellings at risk from fluvial/tidal flooding in Canterbury South East

Ward	Number of dwellings at medium-high risk (up to 1% AEP)	Number of dwellings at overall risk (up to 0.1% AEP)
Barton	0	0
Barham Downs	98	117
Little Stour	209	256
North Nailbourne	255	285

South East Canterbury is dominated by gently undulating farm-land situated on shallow, lime-rich soils. The underlying chalk is generally permeable to surface water, and its valleys are interspersed with springs and groundwater fed ephemeral watercourses.

The main ephemeral watercourse running through this ward is the Nailbourne, which flows into the upper reaches of the Little Stour; this watercourse anecdotally flow for around 6 months once every seven years. Recently they have been flowing more frequently than this, with groundwater emergence activating them in 2000/1, 2003, 2010, 2012 and 2013/14.

The villages along the course of the Nailbourne and Little Stour have historically been flooded from many sources. They have been directly affected by the watercourses, from rising groundwater and the associated emergence of springs, and from surface water runoff from the surrounding hills and valleys. In combination, these sources of flooding have led to further problems caused by the surcharging and backing up of the sewers.

Following the 2000/1 flooding, many improvements to increase the capacity of the channel and various culverts were made (including the construction of a diversion channel at Littlebourne). However, the need for ongoing maintenance of the watercourse and drainage infrastructure was highlighted during the winter of 2013/14, and further improvements to these watercourses will be necessary to reduce both the risk of flooding and its impact to the affected communities.

The NaFRA mapping for Canterbury South East (which shows the areas at risk from flooding with the defences in place) is shown in Appendix 10.

Further information:

- Canterbury Surface Water Management Plan – Stage 1 (April 2012): Section 3.6
- Canterbury City Council's Strategic Flood Risk Assessment (http://goo.gl/3OHSZn)

Planned flood defence works in the Canterbury South East area

The Environment Agency received additional funding from Central Government to assist with repairing the damage sustained to the catchment over the abnormally wet winter of 2013/14.

The various Risk Management Authorities also produced a plan to outline numerous short-term schemes than were delivered before the onset of winter 2014/15. Much of this short-term work was achieved with funding already available from central Government, along with additional contributions from Canterbury City Council, Kent County Council and the local Parish Councils.

A longer-term plan of schemes that will require additional computer modelling, planning and funding has also been produced; these schemes will be progressed over the coming years, with all of the Risk Management Authorities and affected communities contributing to the development of the plans.

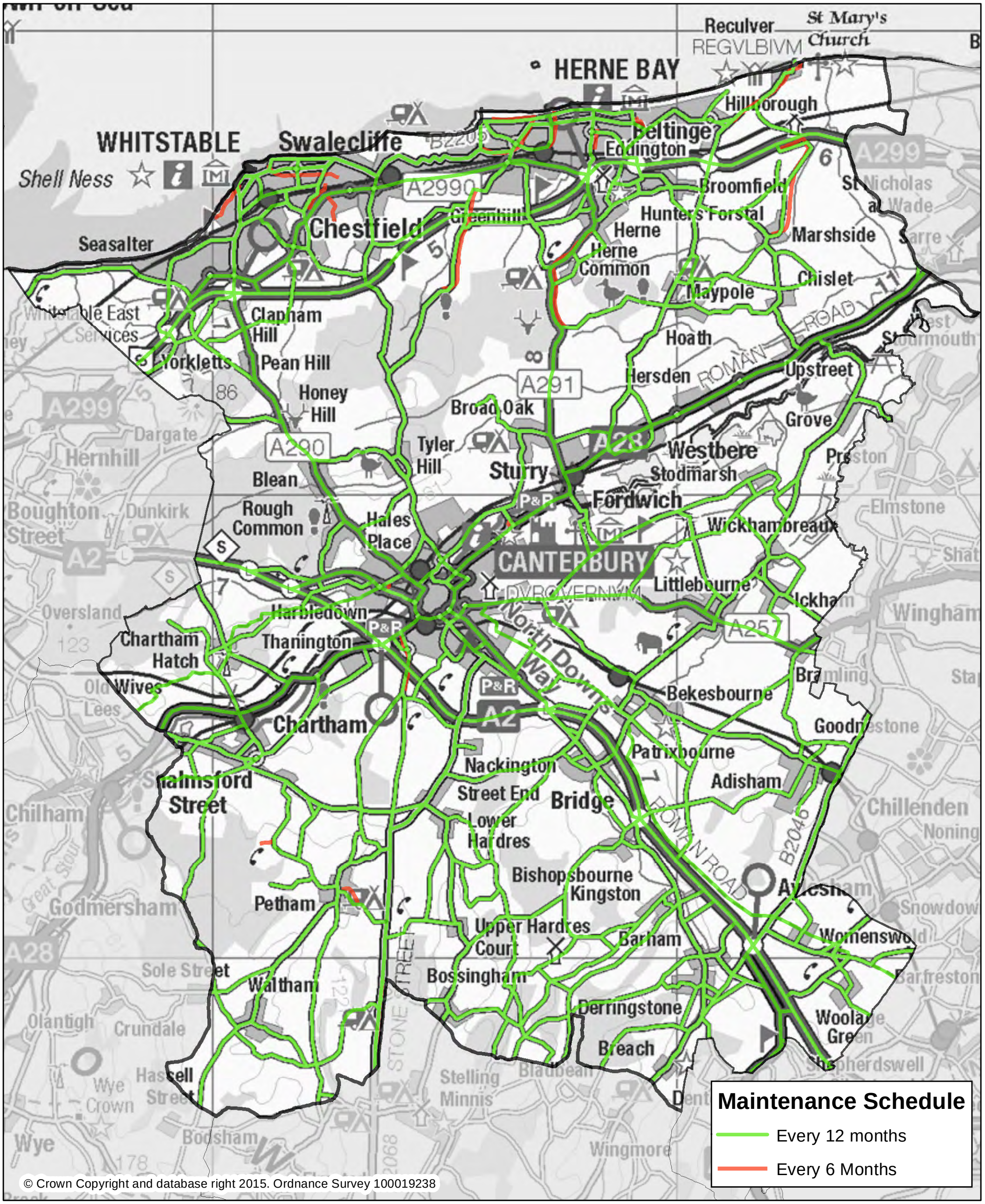
A summary of the works undertaken by the various Risk Management Authorities is available at:

https://goo.gl/yRp3qh

Kent Highways will be installing new soakaways at Dering Road, Bridge to alleviate a known flooding hotspot which affects properties, gardens and the road.

APPENDIX 1

Highways drainage maintenance schedules



KCC Highways maintenance schedule

KCC Highways are responsible for keeping water off the highway making it safe for drivers and other road users.

They look after drains, ponds and lagoons, pumping stations and soakaways.

They DO NOT look after sewers, water leaks or ditches on private land.

Roads known to flood frequently - Every 6 months

High speed roads (roads with a speed limit of 70mph) - Every 12 months

Strategic routes (roads that are the main connection between towns and villages) - Every 12 months

Urban and rural routes (all other roads) - Targeted maintenance

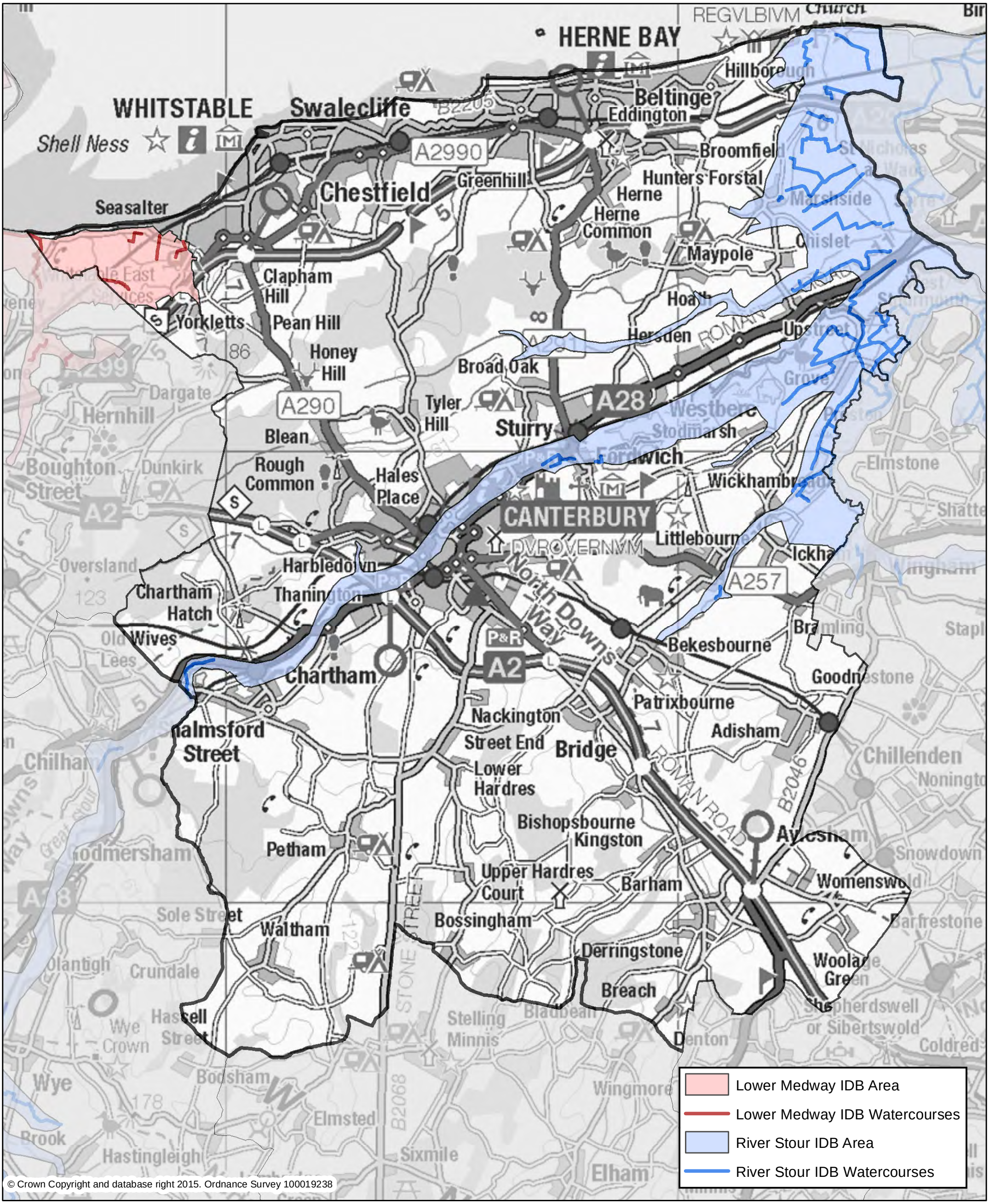
Environment Agency

Kent County Council kent.gov.uk

Canterbury City Council

APPENDIX 2

Internal Drainage Board Areas and Watercourses



Each IDB has permissive powers to undertake work to provide water level management within their Internal Drainage District (IDD), undertaking works to reduce flood risk to people and property and manage water levels for local needs. Much of their work involves the maintenance of rivers, drainage channels, outfalls and pumping stations, facilitating drainage of new developments and advising on planning applications. They also have statutory duties with regard to the environment and recreation when exercising their permissive powers.

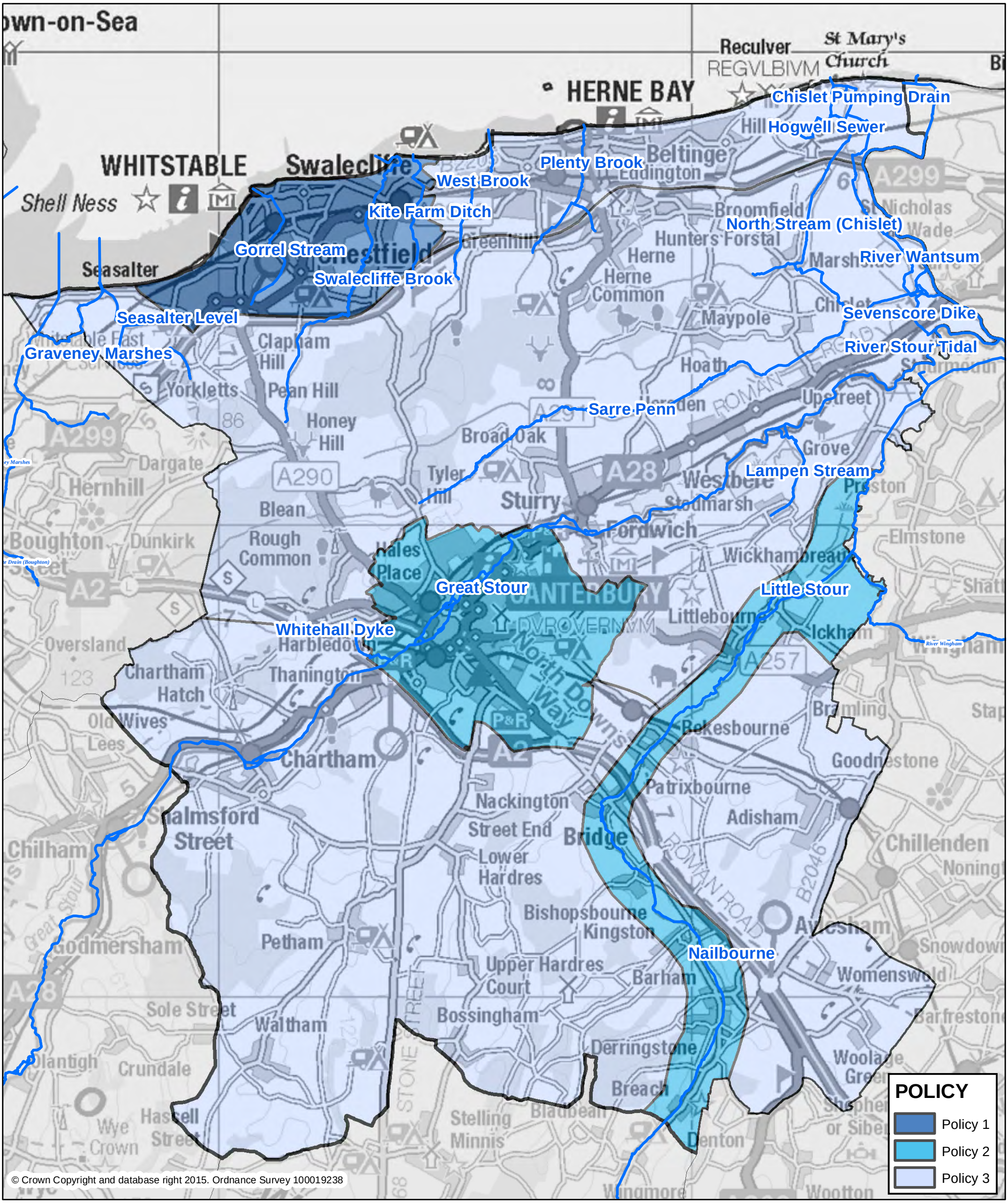
Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

APPENDIX 3

Canterbury Local Flood Risk Management Policy areas



Local Flood Risk Management Policies:

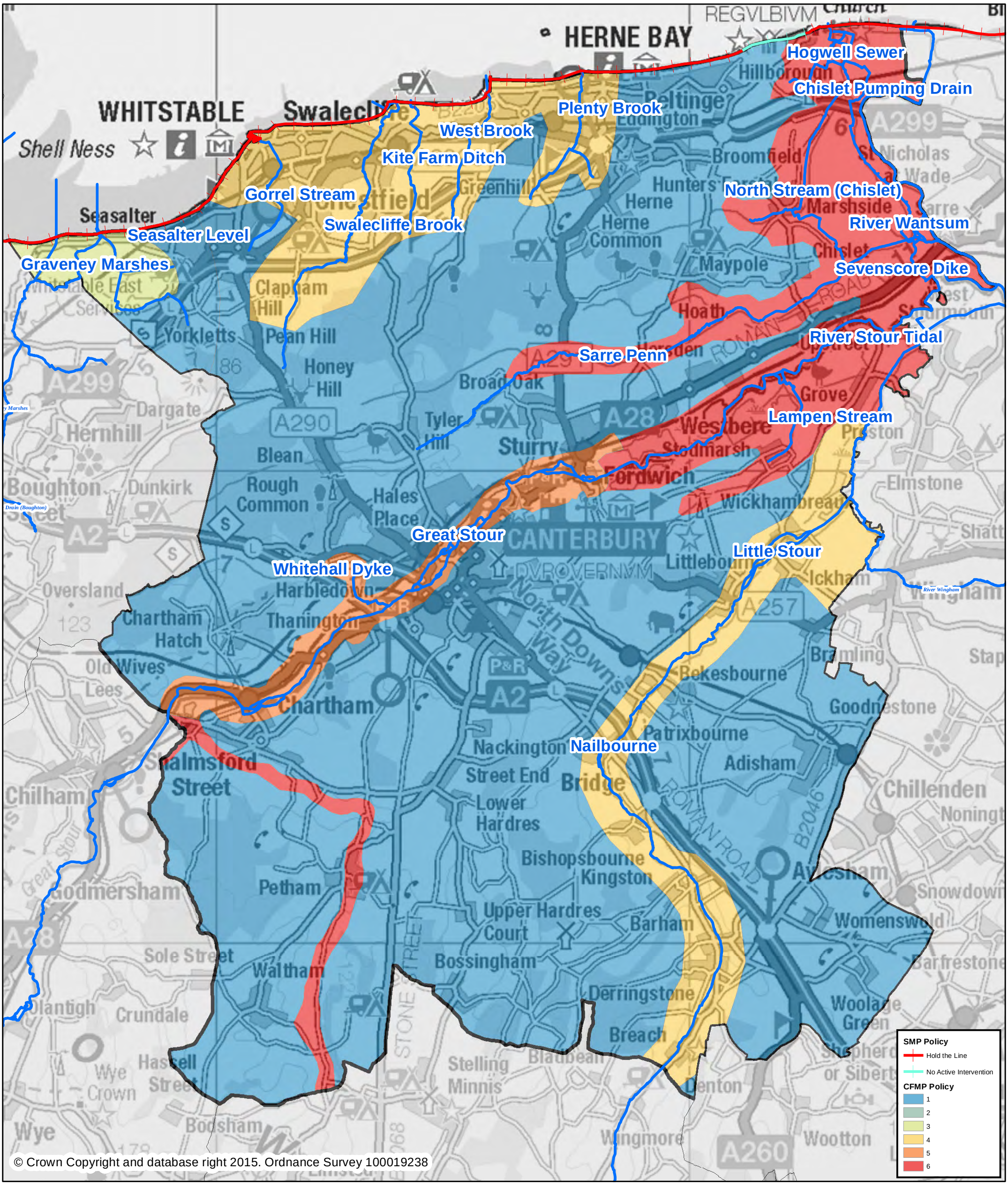
Policy 1
Areas with complex local flood problems.
This policy will be applied to areas where we are aware of flood risk issues that are complex. These are the problems which are technically challenging to understand or where a number of different risk management authorities may be involved in their resolution. These areas will typically have local flood risks that affect large areas, for instance a town centre or suburb. An action plan of feasible options to manage the identified risks will be developed and delivered by the relevant risk management authorities.

Policy 2
Areas with moderate local flood problems.
This policy will be applied to areas where there are known local flood problems which need to be investigated but are relatively straight-forward. These areas will typically have local flood risks that affect localised areas, for instance one or two roads, that require more indepth assessment and interventions than have been used in the past. These areas may not need an in depth assessment of the risks and may be dealt with by ensuring the relevant risk management authorities work ogether effectively to investigate the problems although in some instances these may be necessary.

Policy 3
Areas with low local flood risk which are being managed effectively
This policy will be applied to areas where local flooding risks are currently not significant. That does not mean that these areas are not at risk of local flooding, but the risks can be managed by each risk management authority undertaking its duties effectively.

APPENDIX 4.

Catchment Flood Management Plan and Shoreline Management Plan policy areas



Environment Agency Catchment Flood Management Plans

Policy 1
Areas of little or no flood risk. The situation will continue to be monitored.

Policy 2
Areas of low to moderate flood risk where the existing flood risk management actions can be generally reduced.

Policy 3
Areas of low to moderate flood risk where the existing flood risk is generally being managed effectively.

Policy 4
Areas of low, moderate or high flood risk where the existing flood risk is already being effectively managed, but where further actions may be needed to keep pace with climate change.

Policy 5
Areas of moderate to high flood risk where further action can be taken to reduce flood risk.

Policy 6
Areas of low to moderate flood risk where further action will be taken to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.

Isle of Grain to South Foreland Shoreline Management Plan (next 20 years)

Hold the line
Maintain or improve the existing standard of protection

No active intervention
No investment in coastal defences or operations

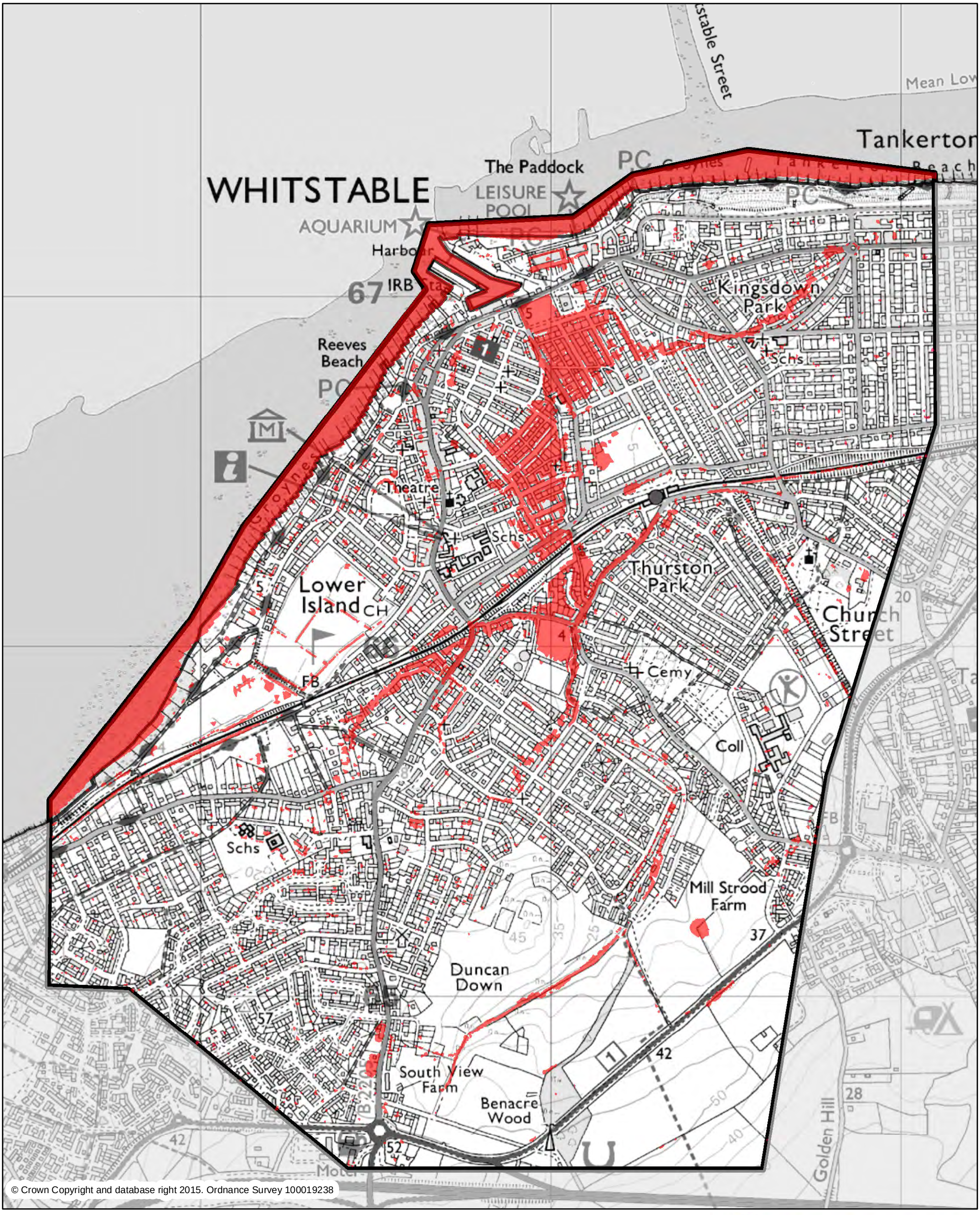
Environment Agency

Kent County Council kent.gov.uk

Canterbury City Council

APPENDIX 5

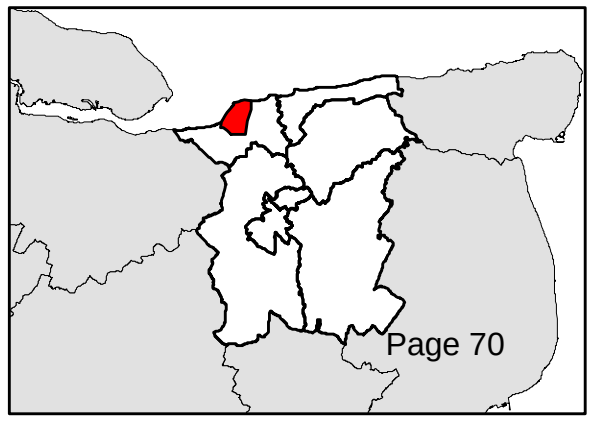
Whitstable: detailed surface water flood risk and NaFRA mapping



Areas at risk from surface water flooding during a 3.3% AEP event (1 in 30yrs)

The Gorrell Stream runs through the town of Whitstable via a combination of culverted and maintained channels. The lower reaches are entirely culverted and the watercourse outfalls to the sea by gravity through Southern Water's Gorrell Tank (or via the adjacent Diamond Road pumping station when the gravity outfall is tide locked).

This map shows the area likely to be affected by a 0.33% AEP rainfall event in Whitstable (1 in 30 yr event). The modelling project that provided these results was commisiioned to provide a better understanding of flood risk within the catchment and town. The study area lies within the boundary drawn above.



Environment Agency

Kent County Council kent.gov.uk

Canterbury City Council

Whitstable

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

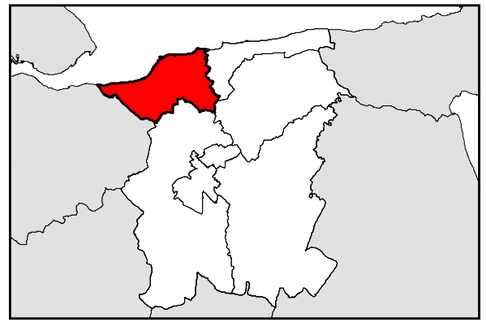
National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

High – At risk from an event with an AEP of 3.3% or greater

Medium – At risk from an event with an AEP of less than 3.33% AEP but greater than or equal to 1%

Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
Properties at risk have been defined using the National Flood Risk Assessment data (NaFRA), which calculates the liklihood of flooding from rivers or the sea. The assessment takes into account the type, location and condition of flood defences, and the chance of these defences overtopping of failing during a flood event. This data is DRAFT, and subject to further checks to verify the information. This should be used as a guide only.

APPENDIX 6

Herne Bay: NaFRA mapping

Herne Bay

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

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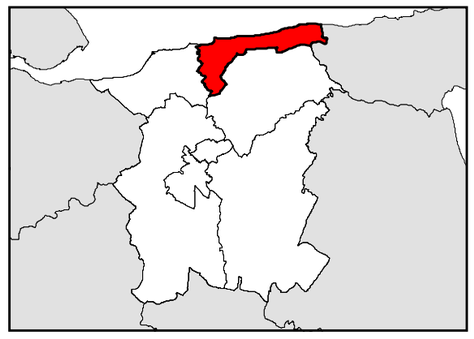
Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
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APPENDIX 7

Herne and Sturry: NaFRA mapping

Herne and Sturry

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

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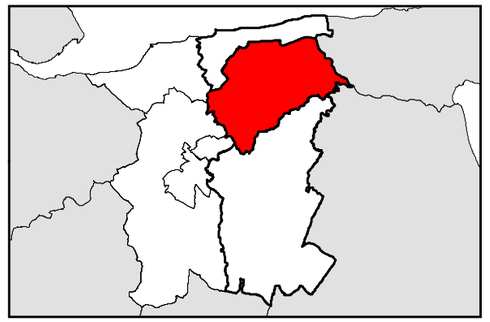
Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
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APPENDIX 8

Canterbury City: detailed surface water flood risk and NaFRA mapping

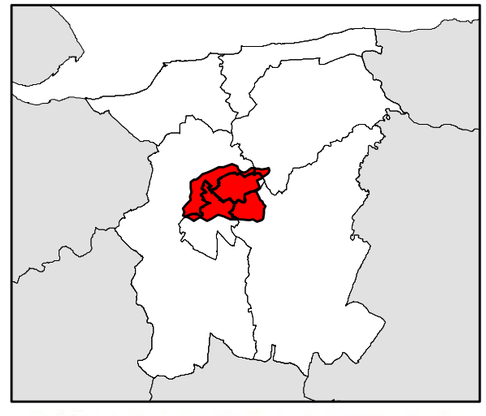
Areas at risk from surface water flooding during a 3.3% AEP event (1 in 30yrs)

The Stage 1 SWMP for Canterbury concluded that the predicted flood risk is not supported by historical flood incidents. Therefore, a more detailed modelling study was been commissioned to fully understand the surface water flood risk to Canterbury.

This involved creating a model as a tool to understand surface water flood risk.

The outputs from the Canterbury model were contrasted to the updated Flood Map for Surface Water (uFMfSW). In general the results of this study show a reduced flood extent compared to the uFMfSW.

This difference was attributed to the explicit representation of the surface water sewer network and the reduced runoff rate from the green spaces within the urban area in the Canterbury surface water model. Whereas in the uFMfSW, the capacity of surface water drainage is estimated and there is no account for open space within an urban area



Environment Agency

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CANTERBURY CITY COUNCIL

Canterbury City
(North East & South West)

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

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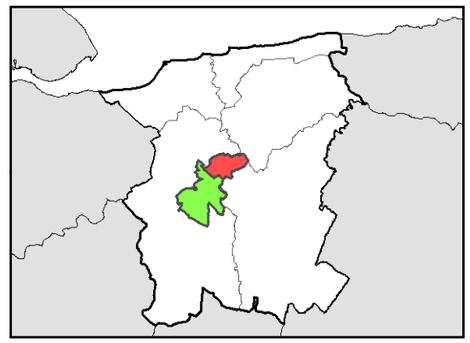
Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council
kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
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APPENDIX 9

Canterbury West: NaFRA mapping

Canterbury West (North)

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

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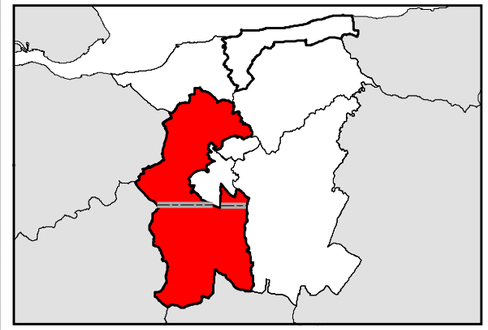
Medium – At risk from an event with an AEP of less than 3.33% AEP but greater than or equal to 1%

Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
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Canterbury West (South)

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

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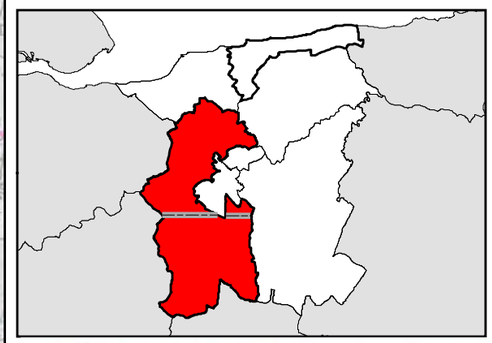
Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
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APPENDIX 10

Canterbury South East: NaFRA mapping

Canterbury South East (North)

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

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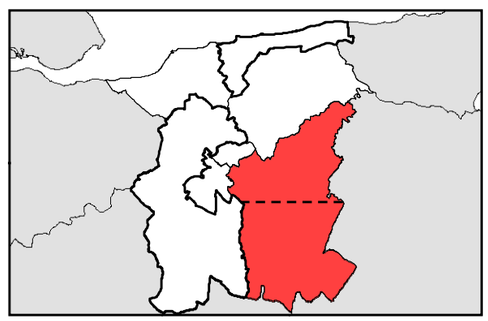
Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
Properties at risk have been defined using the National Flood Risk Assessment data (NaFRA), which calculates the liklihood of flooding from rivers or the sea. The assessment takes into account the type, location and condition of flood defences, and the chance of these defences overtopping of failing during a flood event. This data is DRAFT, and subject to further checks to verify the information. This should be used as a guide only.

Canterbury South East (South)

- District Wards
- Main Rivers
- High
- Medium
- Low
- Very Low

NaFRA:

National Flood Risk Assessment (NaFRA) is a national assessment of flood risk across England and Wales which shows the likelihood of flooding in any year from rivers and the sea. It considers the location, type and condition of defences, mapped on a 50m x 50m grid in four probability bandings:

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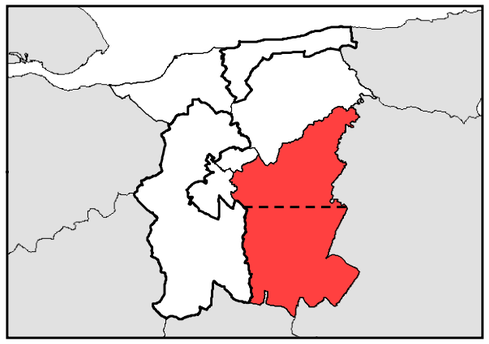
Low - At risk from an event with an AEP of less than 1% AEP but greater than or equal to 0.1%

Very Low – At risk from events with an AEP of less than 0.1%



Environment Agency

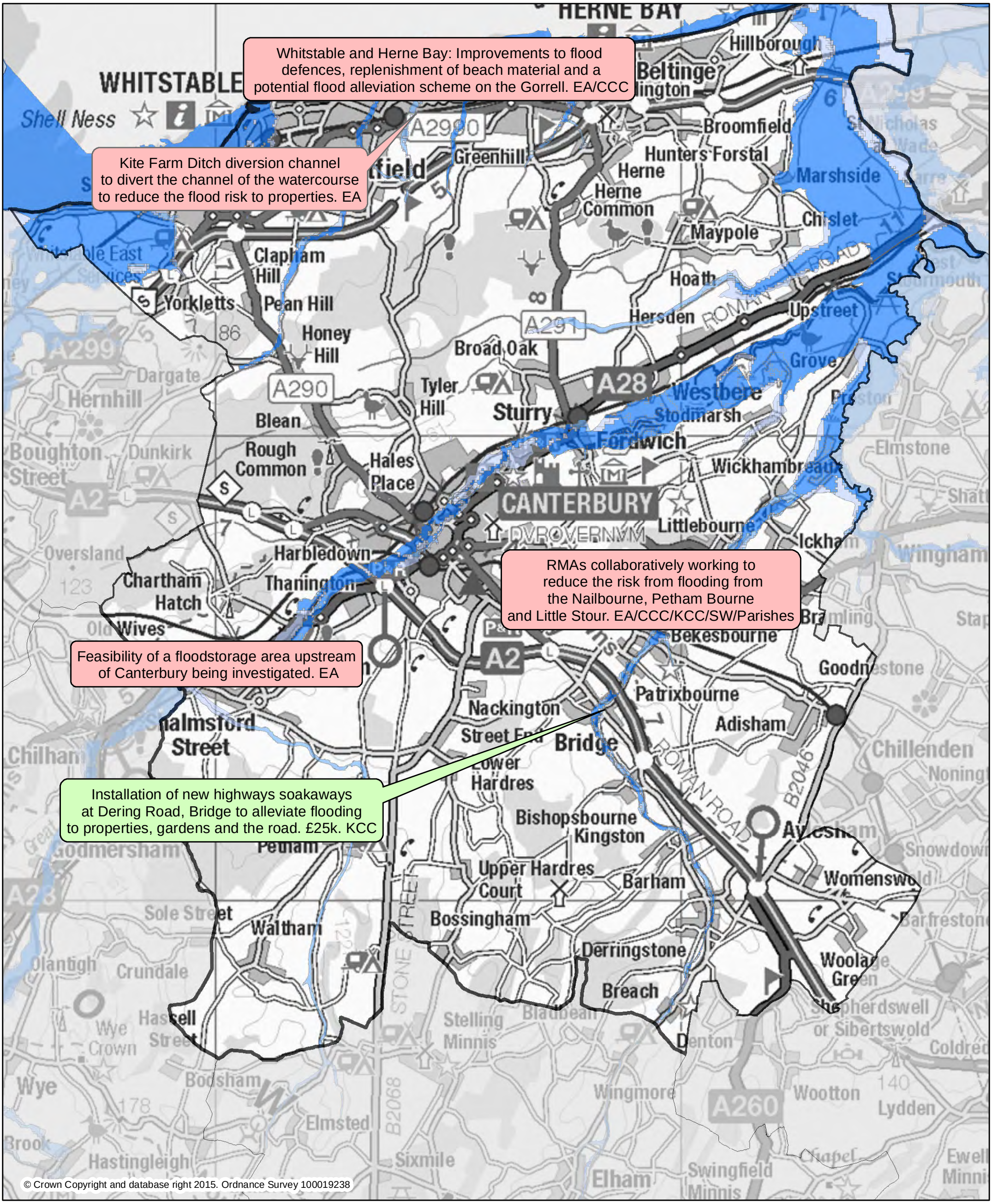
Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

Caveats:
Properties at risk have been defined using the National Flood Risk Assessment data (NaFRA), which calculates the liklihood of flooding from rivers or the sea. The assessment takes into account the type, location and condition of flood defences, and the chance of these defences overtopping of failing during a flood event. This data is DRAFT, and subject to further checks to verify the information. This should be used as a guide only.

APPENDIX 11

Summary of planned works in the Canterbury District



Proposed Flood Defence Works

This map shows the areas within the Canterbury district that are being considered for flood defence investment. Some of the schemes depicted are at an early investigatory stage and additional funding will be needed for the schemes to go ahead (where they have been deemed to be feasible).

The coral coloured text boxes are show potential EA/Local Authority Schemes. The green box shows potential KCC Highways investment.

Environment Agency

Kent County Council kent.gov.uk

CANTERBURY CITY COUNCIL

To: Kent Flood Risk Management Committee – 20th July 2015

From: Michael Harrison, Chairman of Kent Flood Risk Management Committee

Subject: Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since last meeting.

Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since the last meeting of the Committee on 10th March 2015. Members are requested to note this report.

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1. Background

1.1 KCC Resilience and Emergencies Unit and Contact Point receive Environment Agency Flood Alerts and Warnings and Met Office Severe Weather Alerts and Warnings by e-mail and fax on a 24 hour basis. Potential impacts upon communities, infra-structure and the wider environment are then assessed and a response mobilised as required.

1.2 Some 70,000 properties in Kent are located within areas identified as potentially at risk of fluvial or tidal flooding. Where practically possible, these properties are offered a Flood Warning Service by the Environment Agency. However, other parts of the county are also vulnerable to surface and ground water flooding. Early warning of flood risk to communities (including areas outside of floodplains) is delivered through Flood Guidance Statements, Severe Weather Warnings and Kent Resilience Forum Severe Weather Advisory Group.

1.3 More precisely geographically focused Flood Warning Service zones were introduced by the Environment Agency on 29th October 2014. This change was informed by lessons learned from the flooding events experienced during winter 2013/14, and has undoubtedly enhanced the effectiveness of this service.

2. Latest situation

2.1 Autumn, winter and spring 2014/15 did not bring the intensity of severe weather events experienced in 2013/14. However, statistically this period was, as forecast, slightly wetter and warmer than average, and thus continues the recent climatic trend.

2.2 Since 10th March 2015 a total of 5 Environment Agency flood alerts were issued[1]. These were all coastal alerts, issued for the spring tides on Saturday 21st March.

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[1] please see appendix 1

2.3 Further, 3 yellow Severe Weather Alerts have been issued for heavy rain and the risk of surface water flooding, and 2 Yellow Alerts and 1 Warning for high winds and gales since the last meeting[2].

2.4 The Thames Barrier was closed on 3 occasions, for both test (2) and operational (1) reasons.

3. Next Steps

3.1 September 2015 will experience the maximum tidal range in the natural 19 year astronomical tide cycle. The main risk from tidal flooding is between November and March, however, vigilance will need to be maintained throughout this year and KCC, the Environment Agency and other partners are currently working to enhance resilience to tidal surge risk. Indeed, a multi-agency workshop took place at Defra's Nobel House offices, Westminster on 19th June, with a focus upon the role of the local highway network for evacuation and shelter in the event of coastal flooding affecting the Romney Marsh area.

3.2 Members will continue to be regularly updated on flood alerts and response in Kent.

4. Recommendations

4.1 That Members:

- Note the level of alerts received since the last meeting of the Kent Flood Risk Management Committee; and

- Contribute any additional matters arising from debate by the Committee.

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Background documents: None

[2] please see appendix 2

Appendix 1: Environment Agency Flood Alerts and Warnings issued since 10th March 2015		
Flood Zone	**Date issued**	**Status**
Coast from Pegwell Bay to Deal including the Tidal Stour	21st March 2015	Alert
Coast from Dartford to Allhallows	21st March 2015	Alert
Tidal Medway, Medway Estuary and Isle of Grain	21st March 2015	Alert
Isle of Sheppey and Coast from Kemsley to Seasalter	21st March 2015	Alert
Coast from Whitstable to Margate	21st March 2015	Alert

Appendix 2: Met Office Severe Weather Flood Alerts and Warnings issued since 10th March 2015		
Met Office Alerts and Warnings	**Date issued**	**Status**
Yellow Warning of Wind for London and South East England	4th May 2015	Warning
Yellow Alert of Wind for London and South East England	29th May 2015	Alert
Yellow Alert of Wind for London and South East England	31st May 2015	Alert
Yellow Alert of Rain for London and South East England	3rd June 2015	Alert
Yellow Alert of Rain for London and South East England	10th June 2015	Alert
Yellow Alert of Rain for London and South East England	2nd July 2015	Alert

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