Medway Council

Preliminary Flood Risk Assessment Report

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Revision	Date	Details	Prepared by	Reviewed by	Approved by
2.0	**27/07/11**	**Draft**	**David Highley** Senior Project Planner	**Ian Wilson** Head of Capital Projects, Road Safety and Traffic Managment	**Environment Agency South East region.**
2.1	**15/08/11**	**Draft Final**	**David Highley** Senior Project Planner	**Ian Wilson** Head of Capital Projects, Road Safety and Traffic Managment	**RCC Overview and Scrutiny Panel 10/08/11**
2.4	**23/09/11**	**Final**	**David Highley** Senior Project Planner	**Ian Wilson** Head of Capital Projects, Road Safety and Traffic Managment	**Environment Agency South East region.**

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Abbreviations

AStSWF	Areas Susceptible to Surface Water Flooding
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EC	European Commission
FMfSW	Flood Map for Surface Water
FWMA	Flood & Water Management Act 2010
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
MoU	Memorandums of Understanding
PPS25	Planning and Policy Statement 25: Development and Flood Risk
PFRA	Preliminary Flood Risk Assessment
RBD	River Basin District
RFDC	Regional Flood Defence Committee
SAB	SuDS Approving Body
SFRA	Strategic Flood Risk Assessment
SLA	Service Level Agreement
SuDS	Sustainable Drainage Systems

Executive summary

This report has been prepared to assist Medway Council meet their duties to manage local flood risk and deliver the requirements of the Flood Risk Regulations (2009) and Flood and Water Management Act 2010. Medway Council, defined as a Lead Local Flood Authority (LLFA) under the Regulations, is a unitary authority.

The Preliminary Flood Risk Assessment (PFRA), comprising this document, the supporting spreadsheets represents the first stage of the requirements of the Regulations. The PFRA process is aimed at providing a high level overview of flood risk from local flood sources, including surface water, groundwater, ordinary watercourses and canals. As a LLFA, Medway Council must submit their PFRA to the Environment Agency for review by 22 June 2011. The methodology for producing this PFRA has been based on the Environment Agency's Final PFRA Guidance and Defra's Guidance on selecting Flood Risk Areas, both published in December 2010. The Environment Agency has used a national methodology, which has been set out by Defra, to identify indicative Flood Risk Areas across England. Of the ten indicative Flood Risk Areas that have been identified nationally, one is located within Medway Council's administrative area. Within this Flood Risk Area, the Regulations require Medway Council to carry out two subsequent key stages:

- flood hazard maps and flood risk maps; and
- flood risk management plans.

The Indicative Flood Risk Area, shown in Figure 6-2 of this report is situated across most of the Medway area.

In order to develop an understanding of the flood risk across Medway, flood risk data and records of historic flooding were collected from five different local and national sources including the Environment Agency, Southern Water, Kent Fire and Rescue Service and Medway Council Highways Services.

Information relating to nearly 400 flood events, caused by flooding from local sources, was collected and analysed. However, comprehensive details on flood extents and consequences of these events were largely unavailable. Based on the evidence that was collected, no past flood events were considered to have had 'significant harmful consequences'. Therefore, the decision was made to not include any records of past flooding in Annex 1 of the Preliminary Assessment Spreadsheet. It must be noted that there is a risk of flooding from local sources across Medway, particularly from surface water.

Future flood risk has been defined in this report using a variety of modelled data from the Environement Agency.

1 Introduction

1.1 Preliminary Flood Risk Assessment

This document reports the findings of research undertaken by Medway Council towards the preparation of a Preliminary Flood Risk Assessment (PFRA) for its administrative area. The chief drivers behind this research and preparation of the PFRA report are two sets of new legislation: the Flood Risk Regulations (the Regulations), which came into force on the 10 December 2009, and the Flood & Water Management Act (FWMA) which gained Royal Assent on 8 April 2010. Under these pieces of legislation, all unitary authorities, including Medway Council and all county councils in two-tier systems, are designated a LLFA and have formally been allocated a number of key responsibilities with respect to local flood risk management. A full description of these responsibilities is provided in chapter 2.

The purpose of the Flood Risk Regulations was to transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risk) into domestic law in England and Wales and to implement its provisions. In particular it places duties on the Environment Agency and LLFAs to prepare a number of documents including:

- Preliminary Flood Risk Assessments;
- Flood Hazard and Flood Risk Maps;
- Flood Risk Management Plans.

Figure 1-1: Elements of work required under the Flood Risk

22 June 2011	**Prepare Preliminary Assessment Report**	*The PFRA should focus on local flood risk from surface water, groundwater, ordinary water courses and canals.*
22 June 2011	On the basis of the PFRA, identify **Flood Risk Areas**	*Flood Risk Areas are areas of significant risk identified on the of the findings of the PFRA, national criteria set by the UK Government Secretary of State and guidance provided by the Environment Agency.*
22 June 2013	Prepare **Flood Hazard Maps** and **Flood Risk Maps** for each Flood Risk Area	*Used to identify the level of hazard and risk of flooding within each Flood Risk Area to inform the Flood Risk Management Plans.*
22 June 2015	Prepare **Flood Risk Management Plans** for each Flood Risk Area	*Plans setting out risk management objectives and strategies for each Flood Risk Area.*

This PFRA considers past flooding and possible future flooding from the following local flood sources:

- surface water;
- groundwater;
- ordinary watercourses; and
- canals.

The PFRA report must consider floods, which have significant harmful consequences for human health, economic activity and the environment. Flooding associated with the sea and main rivers is the responsibility of the Environment Agency and does **not** need to be considered by the LLFA as part of the PFRA, unless it is considered that it may affect flooding from one of the sources listed above. A map of the Main River Line, detailing watercourses that fall under the responsibility of the Environment Agency is shown in Figure 1-3.

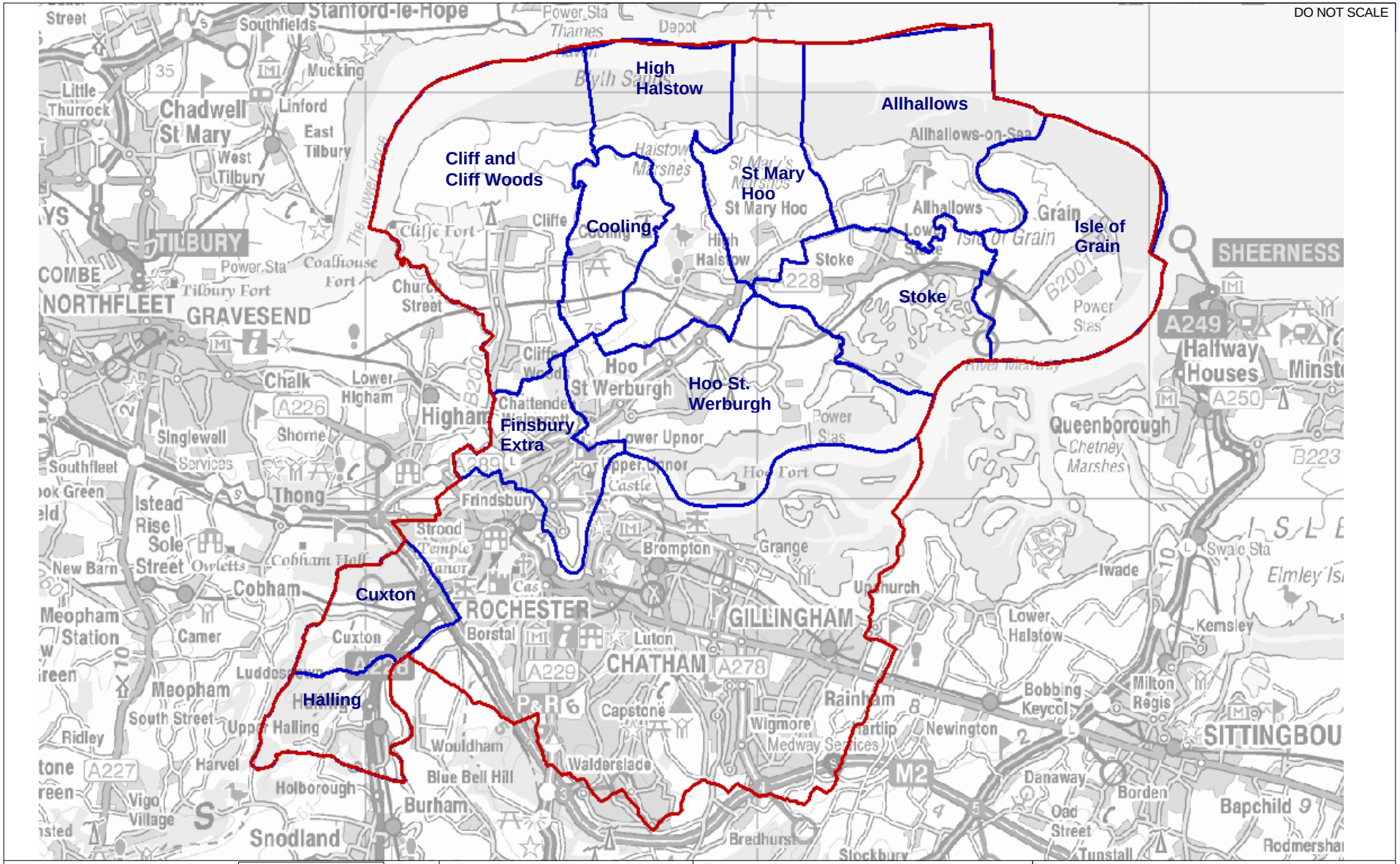
It is not the responsibility of Medway Council as LLFA to report on areas covered by Lower Medway Internal Drainage Board (LMIDB). A map showing their area of responsibility is included in Figure1-4. LMIDB were consulted throughout this process, and will continue to be in all future flood risk exercises.

Figure 1.5 shows the ordinary watercourses for which Medway Council is responsible for as LLFA. This map shows a combination of the detailed river network and ordinary watercourse layer with main river and those watercourses that fall under the responsibility of LMIDB removed.

1.2 Study area

The area for this PFRA is defined by the administrative boundary of Medway Council. The area is divided into 11 parishes, all of which, along with Medway Council's administrative boundary are shown in Figure 1-2.

Medway Council is a unitary authority covering approximately a total area of 26,876 hectares. Of this 7511 hectares is water, and 19365 hectares land. The study area falls across the Thames River Basin District and is served by Southern Water and covered by the South East Environment Agency regional office.



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Key

Medway Boundary

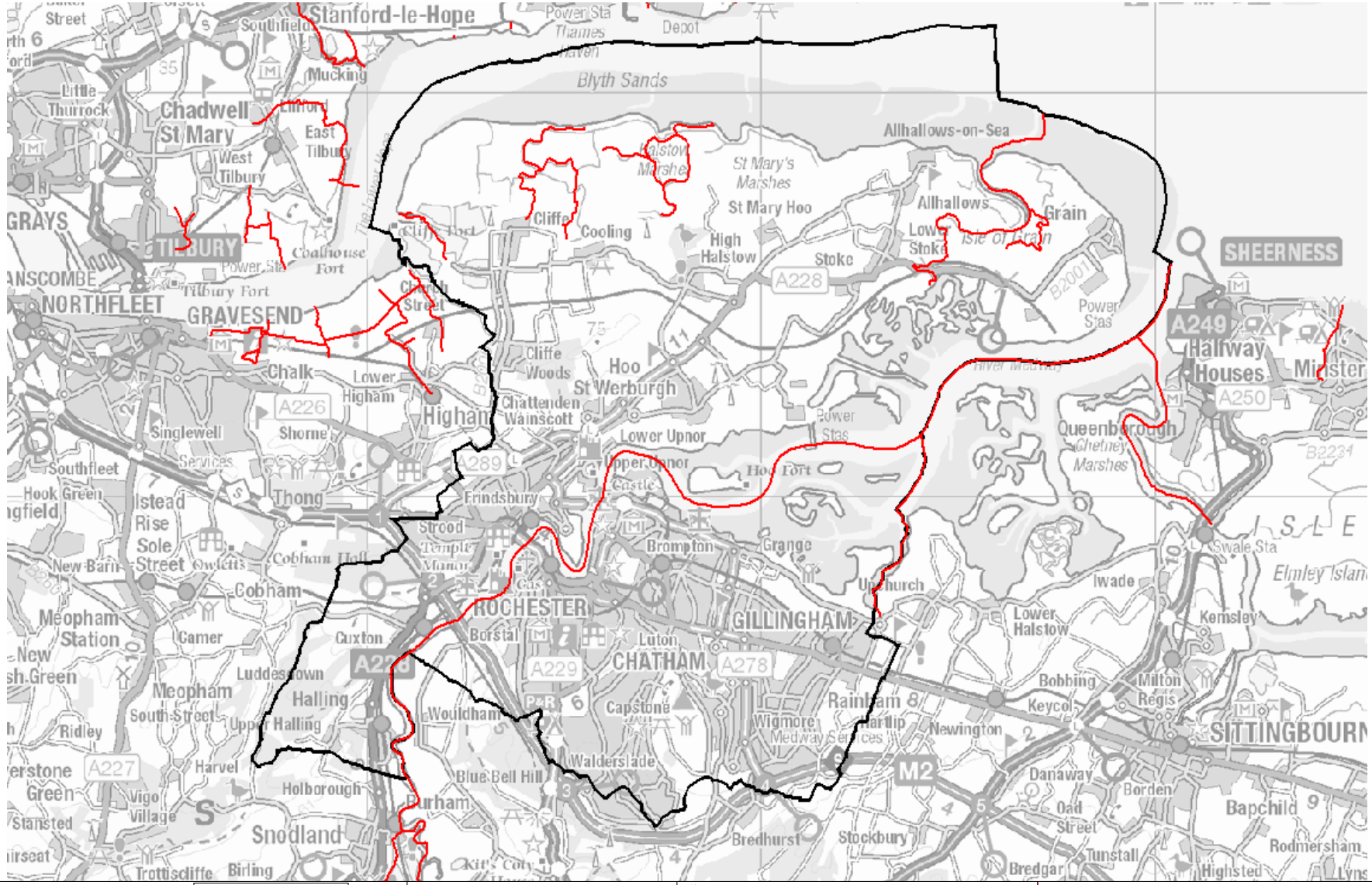
Parish Boundaries

Title

Medway Boundary and Parishes

Figure 1-2

DO NOT SCALE



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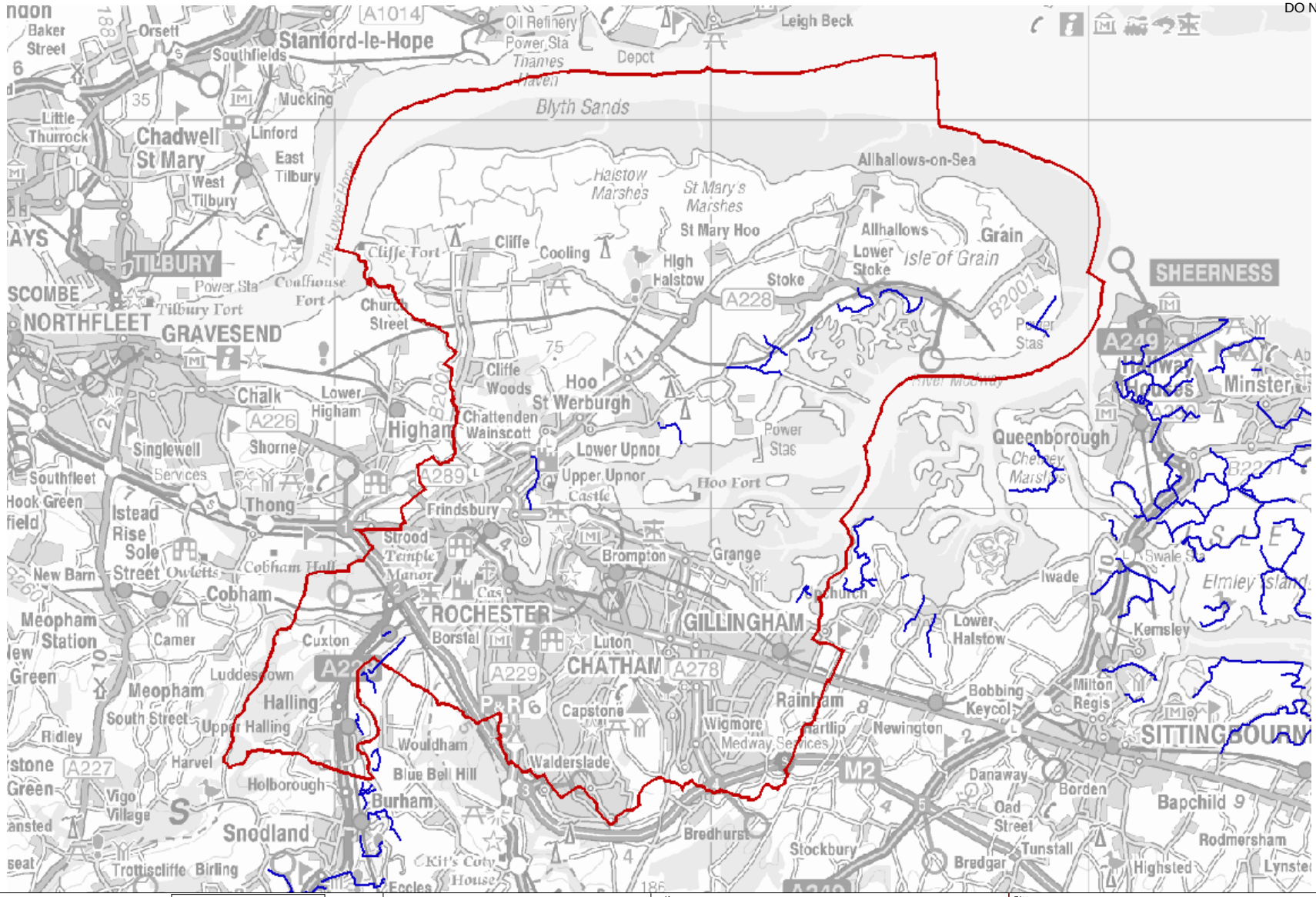
Medway Boundary

Main River Line Medway Area

Title

Main River Line
Medway Area
Figure 1-3

DO NOT SCALE



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- LMIDB

Title

Lower Medway
Internal Drainage Board (LMIDB)
Ordinary Water Courses
Figure 1-4

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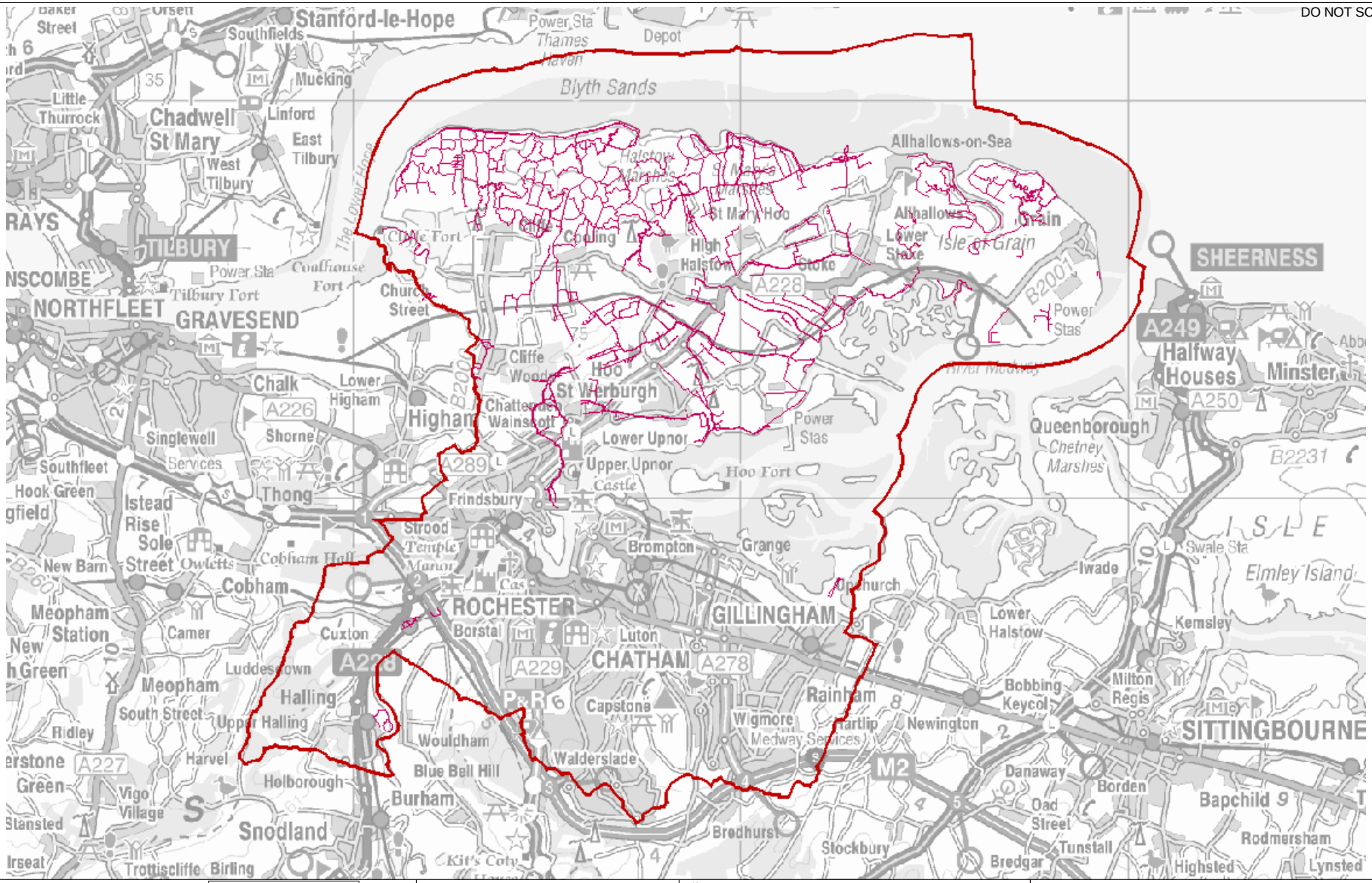

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Key

- Medway Boundary
- Modified Detailed River Network

Title

Modified Detailed River Network
Figure 1-5

1.3 Aims and objectives

The PFRA is a high level screening exercise to locate areas in which local flood risk is significant and warrants further examination through the production of maps and management plans. The aim of this PFRA is to provide an assessment of local flood risk across the study area, including information on past floods and the potential consequences of future floods. The key objectives can be summarised as follows:

- identify relevant partner organisations involved in future assessment of flood risk, and summarise means of future and ongoing stakeholder engagement;
- describe arrangements for partnership and collaboration for ongoing collection, assessment and storage of flood risk data and information;
- summarise the methodology adopted for the PFRA with respect to data sources, availability and review procedures;
- assess historic flood events within the study area from local sources of flooding (including flooding from surface water, groundwater, ordinary watercourses and canals) and the consequences and impacts of these events;
- establish an evidence base of historic flood risk information, which will be built up on in the future and used to support and inform the preparation of Medway's Local Flood Risk Strategy;
- assess the potential harmful consequences of future flood events within the study area;
- review the provisional national assessment of indicative Flood Risk Areas provided by the Environment Agency and provide explanation and justification for any amendments required to the Flood Risk Areas.

2 LLFA responsibilities

2.1 Introduction

The preparation of a PFRA is just one of several responsibilities of LLFAs under the new legislation. This section provides a brief overview of other responsibilities Medway Council is obliged to fulfil under their role as a LLFA.

2.2 Co-ordination of flood risk management

In his review of the summer 2007 flooding, Sir Michael Pitt stated "the role of local authorities should be enhanced so that they take on responsibility for leading the co-ordination of flood risk management in their areas". As the designated LLFA, Medway Council is therefore responsible for leading local flood risk management across Medway. Much of the local knowledge and technical expertise necessary for Medway Council to fulfil their duties as LLFA lies within partner organisations. It is therefore crucial that Medway Council works alongside these groups and organisations as they undertake their responsibilities to ensure effective and consistent management of local flood risk throughout the county and to contribute to the provision of a coordinated and holistic approach to flood risk management across the study area. As Lead Local Flood Authority, it is the role of Medway Council to forge effective partnerships with Southern Water and the Environment Agency, as well as other key stakeholders. Ideally these working arrangements should be formalised to ensure clear lines of communication, mutual co-operation and management through the provision of Service Level Agreements (SLAs) or Memoranda of Understanding (MoU).

2.3 Stakeholder engagement

As part of the PFRA, Medway Council has sought to engage stakeholders representing the following organisations and authorities:

- **Lower Medway Internal Drainage Board**
- **Environment Agency**
- **Southern Water**
- **11 parish councils**
- **Kent Fire and Rescue Service**

It is important to note that we have communicated with and collated data from various department leads within Medway Council including the Highways and Drainage Departments.

2.4 Public engagement

It is recognised that members of the public may also have valuable information to contribute to the PFRA and to local flood risk management more generally across Medway. Public engagement can afford significant benefits to local flood risk management including building trust, gaining access to additional local knowledge and increasing the chances of acceptance of options and decisions proposed in future flood risk management plans. It is important to undertake some public engagement when formulating local flood risk management plans as this will help to inform future levels of public engagement. It is recommended that Medway Council follow the guidelines outlined in the Environment Agency's 'Building Trust with Communities' document, which provides a useful process of how to communicate risk including the causes, probability and consequences to the general public and professional forums such as local resilience forums.

2.5 Further responsibilities

Aside from forging partnerships and coordinating and leading on local flood management, there are a number of other key responsibilities that have arisen for Lead Local Flood Authorities from the Flood & Water Management Act and the Flood Risk Regulations. These responsibilities include:

- **Investigating flood incidents** – LLFAs have a duty to investigate and record details of significant flood events within their area. This duty includes identifying which authorities have flood risk management functions and what they have done or intend to do with respect to the incident, notifying risk management authorities where necessary and publishing the results of any investigations carried out.
- **Asset Register** – LLFAs also have a duty to maintain a register of structures or features, which are considered to have an effect on flood risk, including details on ownership and condition as a minimum. The register must be available for inspection and the secretary of state will be able to make regulations about the content of the register and records.
- **Sustainable Drainage Systems (SuDS) Approving Body** – LLFAs are designated the SuDS Approving Body (SAB) for any new drainage system, and therefore must approve, adopt and maintain any new SuDS within their area.
- **Local Strategy for Flood Risk Management** – LLFAs are required to develop, maintain, apply and monitor a local strategy for flood risk management in its area. The local strategy will build upon information such as national risk assessments and will use consistent risk based approaches across different local authority areas and catchments.

- **Works powers** – LLFAs have powers to undertake works to manage flood risk from surface runoff and groundwater, consistent with the local flood risk management strategy for the area.
- **Designation powers** – LLFAs, as well as district councils and the Environment Agency have powers to designate structures and features that affect flooding or coastal erosion in order to safeguard assets that are relied upon for flood or coastal erosion risk management.

3 Methodology and data review

3.1 Introduction

The approach for producing this PFRA was based upon the Environment Agency's PFRA Final Guidance, which was released in December 2010. The PFRA is based on readily available or derivable data and with this in mind, the following methodology has been used to undertake the PFRA.

3.2 Methodology

Data collection from partner organisations

The following authorities and organisations were identified and contacted to share data for the preparation of the PFRA; Southern Water, the Environment Agency and Lower Medway Internal Drainage Board, Kent Fire and Rescue Service and Medway's 11 parish councils.

3.3 Data sources

Figure 3-1 catalogues the relevant information and datasets held by partner organizations and provides a description of each of the datasets.

Figure 3-1: Relevant information and datasets

	Dataset	Description
Environment Agency	Areas Susceptible to Surface Water Flooding	The first generation national mapping, outlining areas of risk from surface water flooding across the country with three susceptibility bandings (less, intermediate and more).
	Flood Map for Surface Water	The updated (second generation) national surface water flood mapping which was released at the end of 2010. This dataset includes two flood events (with a 1 in 30 and a 1 in 200 chance of occurring) and two depth bandings (greater than 0.1m and greater than 0.3m).
	Flood Map	Shows the extent of flooding from the sea and all watercourses and rivers with a catchment of more than 3km^2 from the sea. The Flood Map combines detailed local data from modelling and mapping studies with information from a national model of England and Wales.
	Areas Susceptible to Groundwater Flooding	Coarse scale national mapping showing areas which are susceptible to groundwater flooding.
	National Receptors Dataset	A national dataset of social, economic, environmental and cultural receptors including residential properties, schools, hospitals, transport infrastructure and electricity substations.
	Indicative Flood Risk Areas	Nationally identified flood risk areas, based on the definition of "significant" flood risk described by Defra.
	Historic Flood Map	Attributed spatial flood extent data for flooding from all sources.
	Detailed River Network (DRN)	A map of all watercourses above a given threshold in size
	Main River Line	Watercourses designated Main Rivers that are the responsibility of the EA
Parish councils	Anecdotal information relating to local flood history and flood risk areas	Anecdotal information from authority members regarding areas known to be susceptible to flooding from excessive surface water, groundwater or flooding from ordinary watercourses.
Medway Council	Highways flooding reports	Highways flooding reports for a number of locations within Medway
Kent Fire and Rescue Service	Historic flooding records	Records of historic flooding events from call out records including location, incident type and response given.
Lower Medway Internal Drainage Board	Historic flooding records	An anecdotal record of one historic flood event.
Southern Water	Historic flood records	Formal records of flood incidents as a consequence of precipition 1987-2011.

3.4 Data limitations

It is hoped that highlighting data limitation issues will serve as a catalyst to improve the collection of flood risk data going forward. A number of issues arose during the data collection process, as described below:

Inconsistent recording systems

The lack of a consistent historic flood data recording systems across partners has led to major inconsistencies in the recording of flood event data. This has resulted in incomplete, or sometimes nonexistent, historic flood record datasets.

Incomplete datasets

As a result of the lack of consistent historic flood data recording arrangements (as described above), many partners have kept poor flood records. Some of the datasets collated are not exhaustive and it is felt that they are unlikely to accurately represent the complete flood risk issues in a particular area. The corresponding gaps in flood data will hinder also the identification of accurate flood risk areas.

Varied quality of data

Although a wide range of sources have been considered as records of flooding, the quality of the information is poor and highly inconsistent. In most cases the information provided was collected for different purposes and is therefore recorded in different ways. Some authorities have sought memory information from residents. However, whilst this has generated a lot of reports, the information actually provided is understandably very limited. In order to properly understand risk from past events it is essential to have a specific date, indication of depth and the source. In many cases this is not present and the gathering and processing of such reports has proved unhelpful.

Future Flood Group meetings will discuss such issues and construct a communications strategy that will modify current recording practices taking into account the nationally imposed recording restrictions that, as shown in the above example, some stakeholders are held to.

Records of consequences of flooding

No data providers were able to provide comprehensive details of the consequences of specific past flood events, which made accurately assessing the consequences of historic flooding impossible.

3.5 Data restrictions and security

In collating flood event data it was asked that Medway Council sign a data protocol agreement with Southern Water. This restricted the circulation of Southern Water data to Medway Council and The Environment Agency. The use of some data is restricted to Medway Council for the preparation of its Preliminary Flood Risk Assessment, including the Flood Map for Surface Water (FMfSW) and the national receptor database. For example, the guidance for use of the FMfSW states "….. only to be used for emergency, land use and development planning, Preliminary Flood Risk Assessment and other purposes as detailed; not to be used at property level; colours not to be changed; not recommended to be used internally with more detailed background than 1:10,000 or externally with more detailed background than 1:25,000

as the data is open to misinterpretation if used at a more detailed scale, ……..” The use of other data is unrestricted.

4 Historic flood risk

4.1 Overview of historic flooding in Medway

Records of historical flood events and flooding hotspots were collected across Medway Council’s administrative area. Maps highlighting the locations of these past flood events are illustrated in Figures 4-1 and 4-2. A summary of information specific to each source of flooding considered as part of the PFRA is included below.

Existing datasets, reports and anecdotal information from the stakeholders listed above were collated and reviewed to identify details of major past flood events and associated consequences including economic damage, environmental and cultural consequences and impact on the local population.

Based upon the data collected there was found to be varied quality in historic flood records and information. Data from Kent Fire and Rescue Service for instance was of insufficient quality to be of use. Although events were recorded with dates and geo-reference details the record of flooding was not specific enough to determine the cause. Kent Fire and Rescue Service policy restricts the recording of events to a nationally imposed coding system. A free text field records some details of flooding, though no current system requires telephone operators to record the source of flooding. Even if a source of flooding is given data cannot be fully relied upon as would normally come from a non-expert source, i.e. a member of the public.

Although Kent Fire and Rescue data has been included in the historic flood event data set in Annex 5 of this report it has not been mapped for the reasons given above.

Data was requested from the 11 local parish councils. They had no formal records of localised flooding and were not able to provide anecdotal data in the timeframe given. All collected data is represented in the following map. Data from Kent Fire and Rescue is, as earlier stated, of insuffucient quality to be use in this exercise.

Surface water flooding

Surface water flooding occurs when heavy rainfall exceeds the capacity of local drainage networks and water flows across the ground.

Historic surface water flood data was collected from Medway Council Highways Drainage department, shown in Annex 5 of this report and mapped in Figure 4-2.

Groundwater flooding

Groundwater flooding occurs as a result of water rising up from the underlying aquifer or from water flowing from abnormal springs. This tends to occur after long periods of sustained high rainfall, and the areas at most risk are often low-lying where the water table is more likely to be at shallow depth. Groundwater flooding is known to occur in areas underlain by major aquifers, although increasingly it is also being associated with more localised floodplain sands and gravels.

No historic data is available for local groudwater flood events

Sewer flooding

Sewer flooding is a consequence of rainwater inundation temporarily exceeding the capacity of the sewer network. Southern Water provided data relating to over 360 incidents of flooding from precipitation. The critical element in assessing the risk will be the intensity of the storm that gave rise to the precipitation. This is not available within the current data set. However the records will be mapped and will form the basis for future assessments and comparisons.

Southern Water data is geo-referenced by post code. Although more accurate geographic details are available it was felt by Southern Water that specifying locations to the extent where a specific property is identifiable may cause it to be blighted and affect its value. Flood events are therefore mapped to the post code centre point. Although this method is inherantly inaccurate it will still prove useful in assessing the density of flood events across Medway. Some flood events were duplicated, and some post codes incorrect and untraceable. These were disregarded for the purposes of mapping.

Ordinary watercourse flooding

Ordinary watercourse flooding is caused when the capacity of the watercourse is exceeded as a result of precipitation, or as a result of blocked outflow to the sea at high tide, as described in the section below. Some ordinary watercourses in Medway are the responsibility of Medway Council (shown in Figure 1-6) and some of the Lower Medway Internal Drainage Board.

The Lower Medway Internal Drainage Board formally reported only one event. The Board indicated a significant amount of anecdotal and informally recorded incidents of historic flooding, but was unable to communicate such incidents on the timeframe given. The single event reported was from sea water flooding and therefore was not included in the map of Historic Flood Events.

Medway Council's Highways department Drainage Engineers reported 24 incidents of flooding, or areas historically susceptable to flooding that were predominantly from issues relating to ordinary course drainage.

Interaction with main rivers and the sea

There is anecdotal evidence from Medway Highways department that the interaction between the Thames Estuary at high tide and the surface water drainage system to the north of the Hoo Peninsula causes localised flooding. During periods of heavy rainfall, watercourses cannot discharge through flap valves as these are closed due to the high tide in the Estuary.

4.2 Maps of historic flood events

The maps that follow have been plotted using some of the data sets detailed in Annex 5 of this report. Of the data collected only the following data sets were considered of sufficient quality to be of any use in this exercise

Medway Council Highways Department

Twenty one incidents of flooding from local sources, or areas in which regular flood events from such sources occurred, have been plotted in Figure 4-2. The spread of

events does not correlate with the Indicative Flood Risk Area shown in Figure 6-1 of this report.

Southern Water

Southern Water provided data relating to 376 incidents of flooding caused by rainwater inundation temporarily exceeding the capacity of the sewer network. A map of these events is shown in Figure 4-3.

It should be noted that 6 duplicated events, and 7 events whose postcodes were incorrect were removed from the mapping process, leaving a total of 363 events plotted.

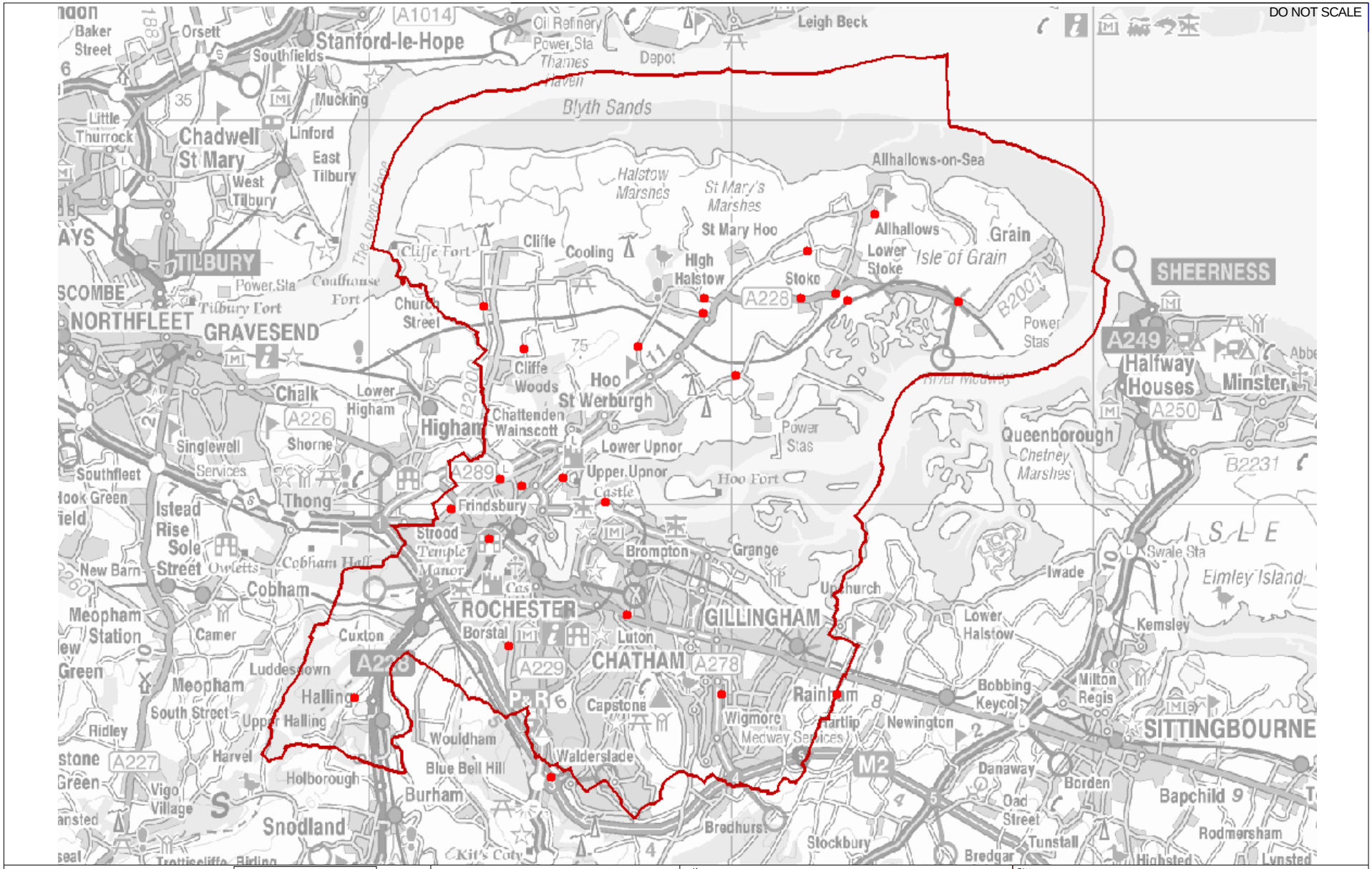
Although the spread of events shown has a higher density in an area that lays within the Indicative flood Risk Area (Figure 6-1) the area covered by such events does not accutrately reflect the the Indicative Flood Risk Area

4.3 Consequences of historic flooding

As a result of the issues discussed in chapter 3.4, insufficient data is available to draw definitive conclusions on the impacts and consequences of historic flood events on people, the economy and the environment, as this information has not been recorded in the past.

Due to the lack of accurate and consistant information available, no historic flood events have been considered to have had significant harmful consequences, and therefore none will be recorded in Annex 1 of the Preliminary Assessment Spreadsheet. However, a complete record of locations where flooding has occurred will be kept by Medway Council as a future evidence base. This base will be built up in the future through ensuring full details of flood events are recorded; this will then be used to support and inform future PFRA cycles as well as Medway's Local Flood Risk Management Strategy.

A table showing the data collected from Medway Council's Highways Department, Lower Medway Internal Drainage Board and Southern Water is included in Annex 5 of this report.



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Key
- Medway Boundary
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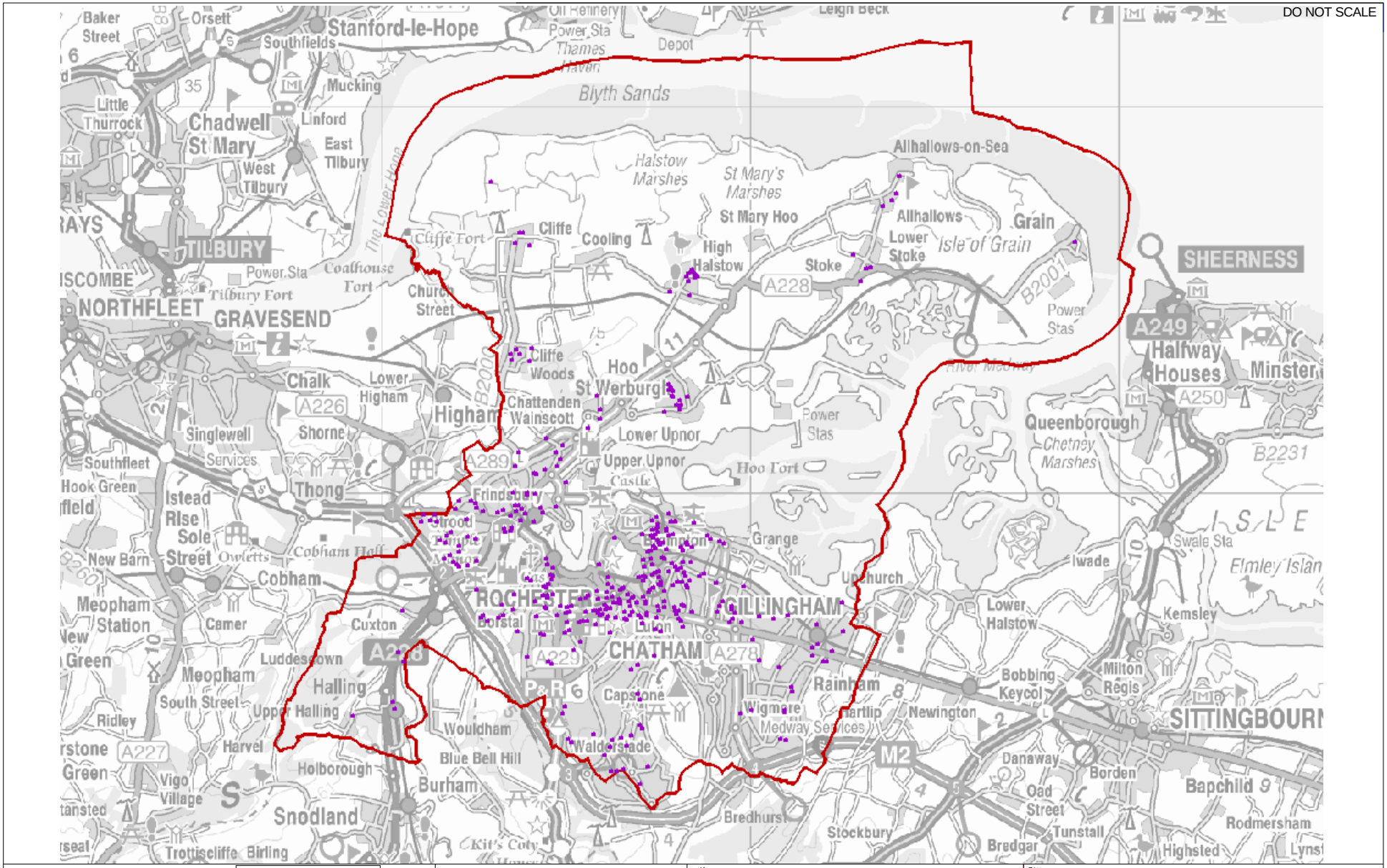
Title

Historic Flood Events
Medway Highways Department
Figure 4-1



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5 Future flood risk

5.1 Overview of future flood risk

Assessing future flood risk

The identification of Flood Risk Areas through the PFRA should also take into account future floods, defined as any flood that could potentially occur in the future. This definition includes current predicted flood extents and those with an allowance for climate change. The assessment of future flood risk will primarily rely on a technical review of the Environment Agency's Flood Map for Surface Water, which has been recently circulated to Lead Local Flood Authorities. The Flood Map for Surface Water uses a numerical hydraulic model to predict the extent of flood risk from two rainfall events (1 in 30 annual chance and 1 in 200 annual chance). The following factors were considered when assessing future flood risk across the Medway study area; topography, location of ordinary watercourses, location of flood plains that retain water, characteristics of watercourses (lengths, modifications), effectiveness of any works constructed for the purpose of flood risk management, location of populated areas, areas in which economic activity is concentrated, the current and predicted impact of climate change and the predicted impact of any long-term developments that might affect the occurrence or significance of flooding, such as proposals for future development.

Surface water flooding

No local information is currently available on surface water flood risk in Medway. The Environment Agency has produced a national assessment of surface water flood risk in the form of two national mapping datasets. The first generation national mapping, Areas Susceptible to Surface Water Flooding (AStSWF), contains three susceptibility bandings for a rainfall event with a 1 in 200 chance of occurring in any given year. The national methodology has since been updated to produce the Flood Map for Surface Water (FMfSW), a revised model containing two flood events (1 in 30 annual chance and 1 in 200 annual chance) and two depth bandings (greater than 0.1m and greater than 0.3m). The greater than 0.3m category has been used from this dataset, as this depth approximates to an average threshold level for most properties, therefore properties in this area are likely to experience internal flooding. Flooding up to 0.1m is unlikely to flood many properties internally.

The two different datasets derive their outputs from modelling using differing assumptions regarding drainage rate, topography, density of buildings and several other factors. The FMfSW however, makes an assumption of 12mm per hour as a drainage rate in urban areas (nationally representative figure derived from analysis of typical sewer performance), whereas the AStSWF dataset assumes no drainage rate at all. As Medway has an estimated drainage rate of between 20 and 30mm across its urban and rural areas it would be more appropriate to use the FMfSW to map future flood risk.

Locally agreed surface water information has been considered in conjunction with the Environment Agency in order to assess which dataset best represents local conditions across Medway. The Flood Map for Surface Water has been chosen. This data is illustrated in Figure 5-1 and Figure 5-2, highlighting areas at risk of surface water flooding.

The mapping produced by the Environment Agency is very helpful in identifying potential area at risk but does not accurately reflect the records that we have. In most

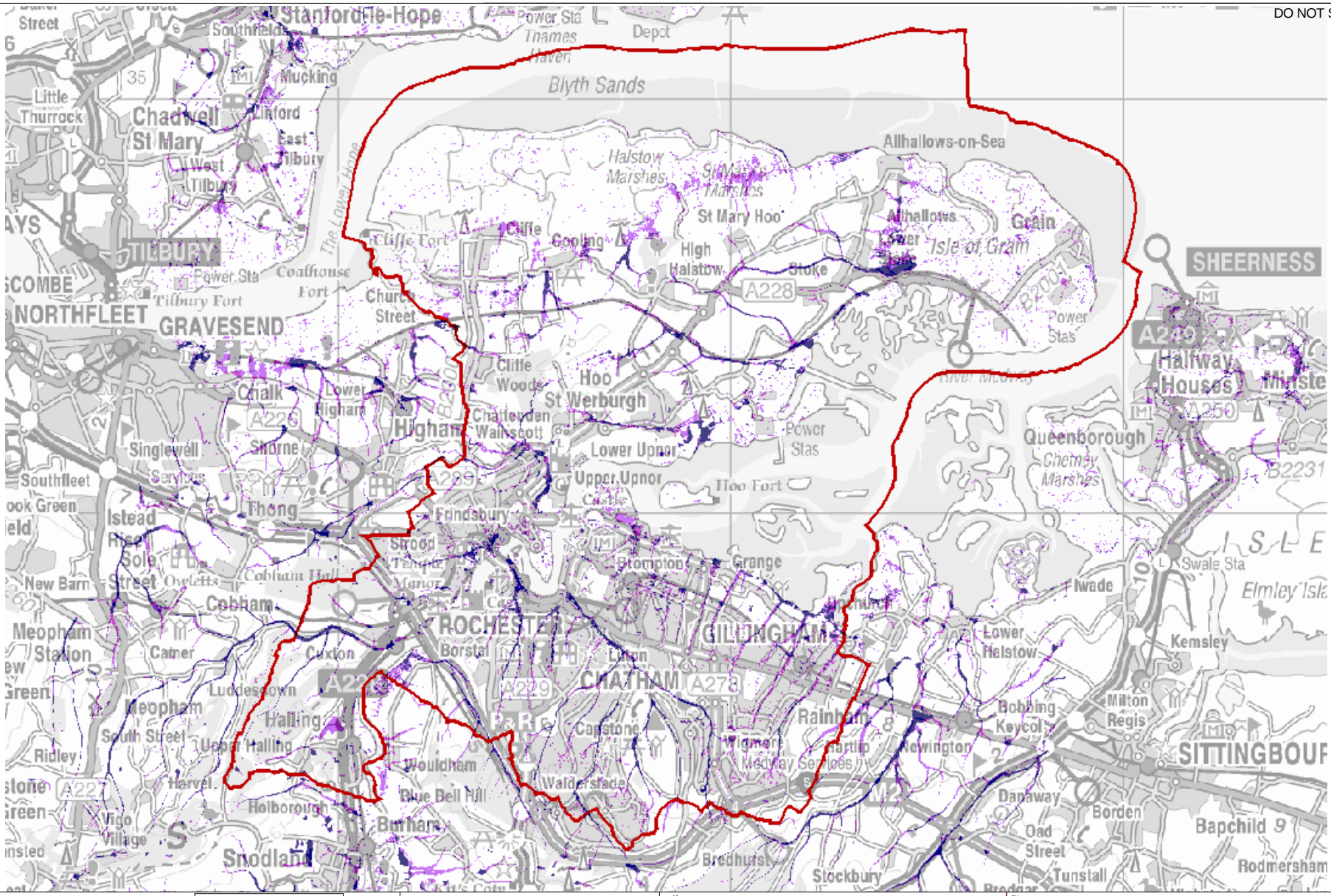
cases it appears to underestimate the drainage run off through the road and surface water drainage systems and is therefore considered only as a worst case.

The mapping from the Environment Agency has been produced on a national scale and it is not surprising that it may not fully reflect the local position. The main risk of flooding in Medway comes from tidal flooding. This risk is not covered in the report as responsibility for assessing that risk rests with the Environment Agency. There is a risk of flooding from sources other than the main river which occurs because the outfalls are tide locked. Under the Act Medway remains responsible for investigating such incidents and risks.

For these reasons the general approach taken in this report is that the currently available information is helpful as a starting point but that the information is not sufficiently robust to use for accurate assessment of risk, nor for decisions as to response and future planning. A key element of the report is to set out how accurate and robust information will be gathered in the future and used to inform further development of flood risk plans.

The FMfSW layers in Figures 5-1 and 5-2 below shows an even spread of risk throughout Medway, with a slight increase in density in the Rochester, Chatham and Gillingham areas. This map does not, therefore show a noteable corellation with the Indicative Flood Risk Area shown in Figure 6-1 of this report.

DO NOT SCALE



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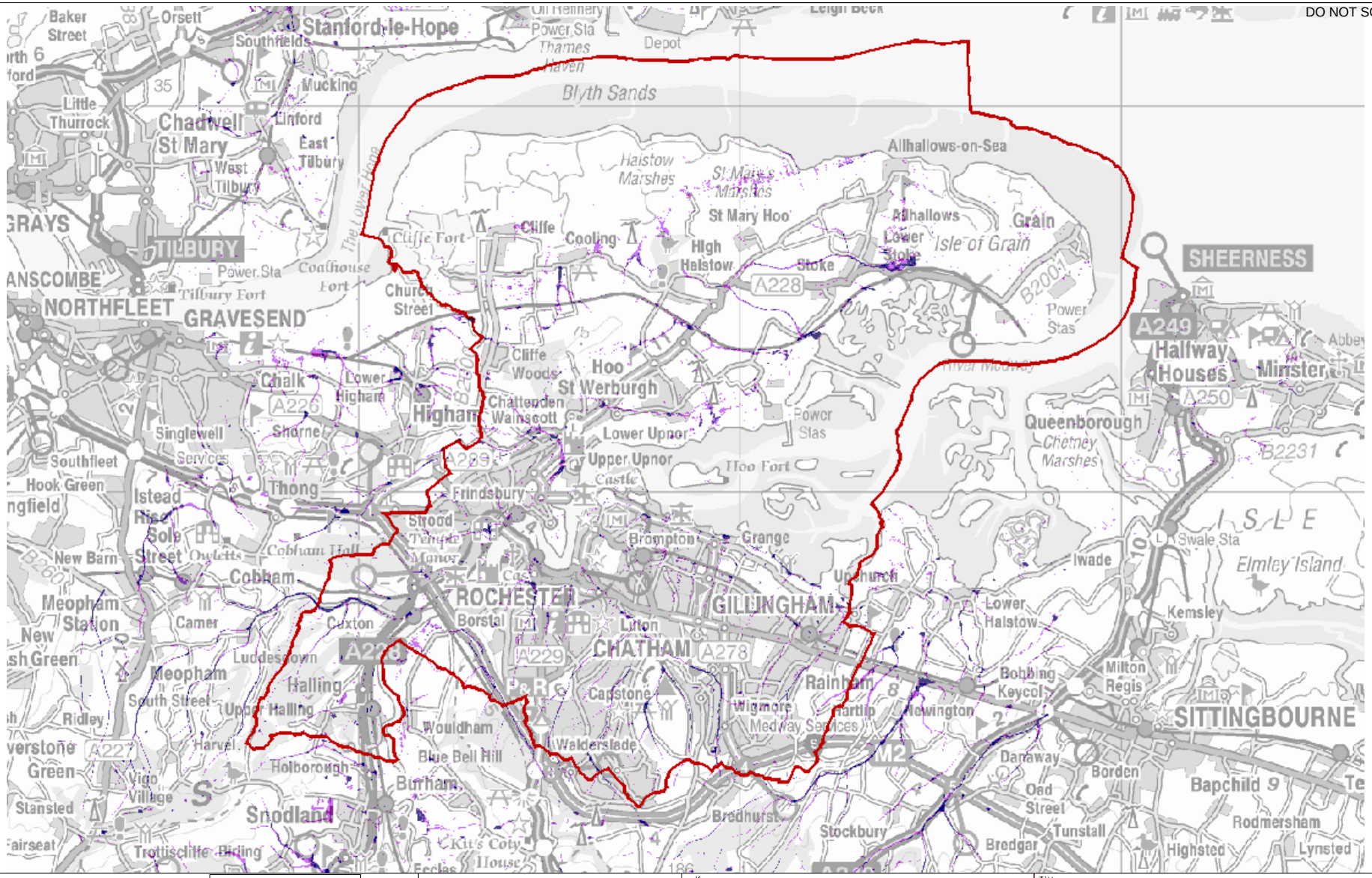
Key

- Medway Boundary
- Surface water shallow (more than 0.1m deep)
- Surface water deep (more than 0.3m deep)

Title

Flood Map for Surface Water
1 in 200 Annual Chance
Figure 5-1



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Key

- Medway Boundary
- Surface water shallow (more than 0.1m deep)
- Surface water deep (more than 0.3m deep)

Title

Flood Map for Surface Water
1 in 30 Annual Chance
Figure 5-2

Groundwater flooding

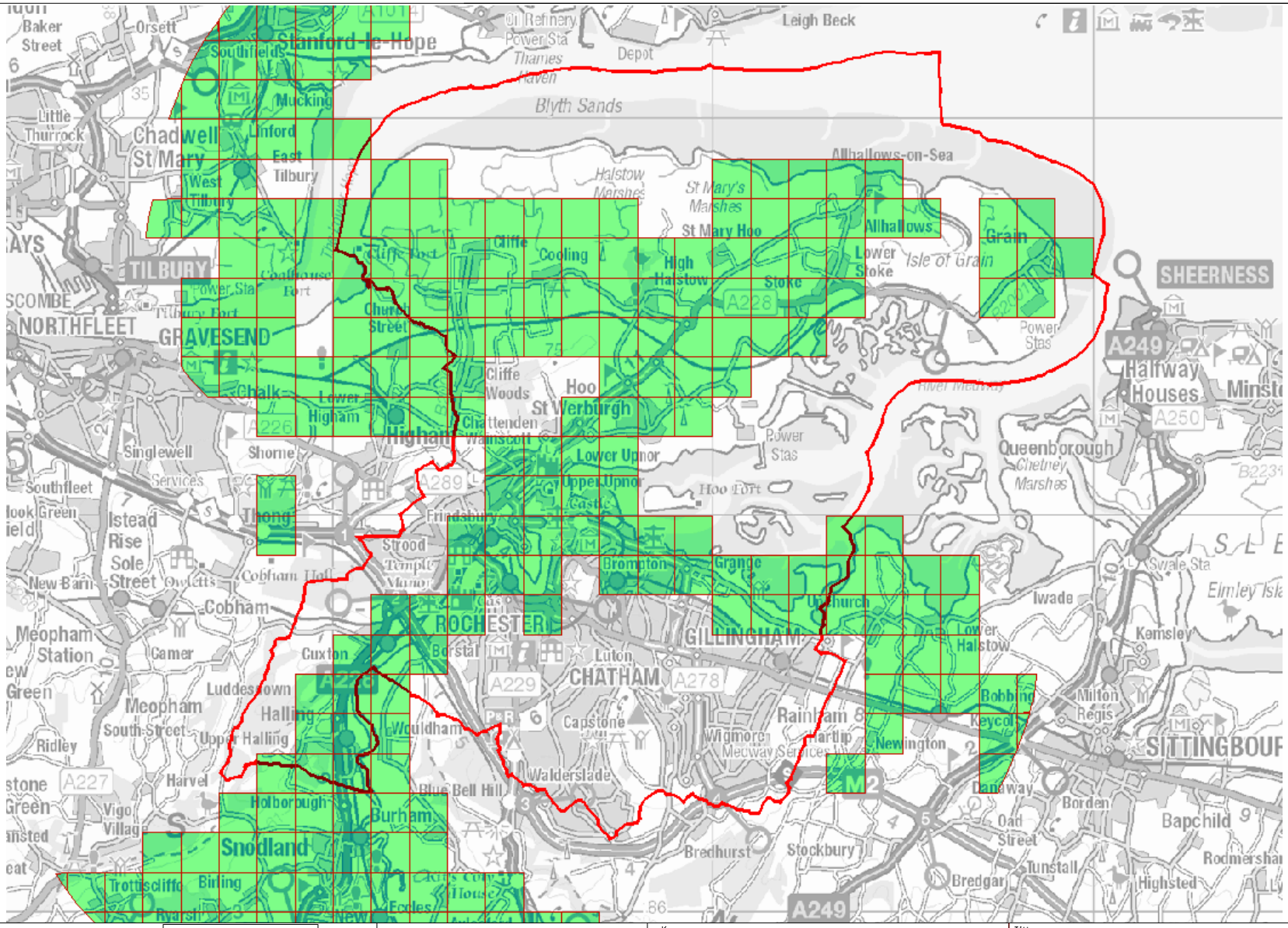
There is no local information available that provides evidence on future groundwater flood risk across Medway and groundwater rebound is not believed to be an issue in the area. The Environment Agency's national dataset, Areas Susceptible to Groundwater Flooding, has been used to form the basis of the assessment of future flood risk from groundwater. This dataset is illustrated in Figure 5-3 and areas at high risk from groundwater flooding are identified.

Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. It was developed specifically by the Environment Agency for use by Lead Local Flood Authorities (LLFAs) for use in Preliminary Flood Risk Assessment (PFRA) as required under the Flood Risk Regulations. The data was produced to annotate indicative Flood Risk Areas for PFRA with information to allow LLFAs to determine whether there may be a risk of flooding from groundwater. It is also being made available to LLFAs to support PFRA, so that LLFAs can obtain a broad feel for the wider areas which might be at risk from groundwater flooding. It covers England and Wales.

This data has used the top two susceptibility bands of the British Geological Society (BGS) 1:50,000 Groundwater Flood Susceptibility Map and thus covers consolidated aquifers (chalk, sandstone etc., termed 'clearwater' in the data attributes) and superficial deposits (younger materials that are less than 10,000 years old, and sit above the bed rock, e.g. subsoil, clay, sand gravel and peat). It does not take account of the chance of flooding from groundwater rebound (seasonal recharge of the aquifer from wetter weather and decreased plant growth). It shows the proportion of each 1km grid square where geological and hydrogeological conditions show that groundwater might emerge. The susceptible areas are represented by one of four area categories (listed below) showing the proportion of each 1km square that is susceptible to groundwater emergence. It does not show the likelihood of groundwater flooding occurring.

In common with the majority of datasets showing areas which may experience groundwater emergence, this dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The mapping below shows an even spread of risk throughout the Northern and central areas of Medway, with a marked absence of risk in the Southern areas, across some of Rochester, and most of Chatham and Gillingham. This map, therefore shows areas of risk and non-risk that directly contradicts the Indicative Flood Risk Area shown in Figure 6-1 of this report.



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Key

- Medway Boundary
- Areas Susceptible to Groundwater Flooding

Title

Areas Susceptible to Groundwater Flooding
Figure 5-3

Canals

Medway has no canals within its administrative boundary.

Ordinary watercourses

There is no reliable local information available that provides evidence on future ordinary watercourse flood risk across Medway. The Environment Agency's national Flood Map has been used to assess the risk of flooding from ordinary watercourses. The Flood Map shows the extent of flooding from the sea and all watercourses and rivers with a catchment of more than 3km^2. Smaller watercourses, will not, therefore be included in this method so not all of the ordinary watercourse in the Medway Council area are covered.

The Flood Map is split into Flood Zone 2 0.1% (1 in 1000) chance of flooding from rivers and/or the sea in any given year and Flood Zone 3 1% (1 in 100) chance of flooding from rivers and 0.5% (1 in 200) chance of flooding from the sea in any given year. As these zones are virtually identical within the Medway boundary, only Flood Zone 2 has been shown below in Figure 5-4. These maps have had areas of flooding from the Sea and Main River (the responsibility of the EA) removed, leaving only areas of potential flooding from ordinary watercourses.

Ordinary watercourses that are the responsibility of Medway Council as LLFA are shown in Figure 1-6, a modification of the Detailed River Network (DRN) map (Figure 1-5). These watercourses have been deduced by removing areas that are covered by the Environment Agency and LMIDB from the DRN.

Figure 5-5 shows the areas identified to be at risk of flooding from ordinary watercourses that have a catchment larger than 3km^2. These areas are ringed in red. As shown in this figure, the remainder of the ordinary watercourses do not have any flood risk information available.

The spread of risk shown in Figure 5-6 does not corellate with the Indicative Flood Risk Area shown in Figure 6-1 of this report

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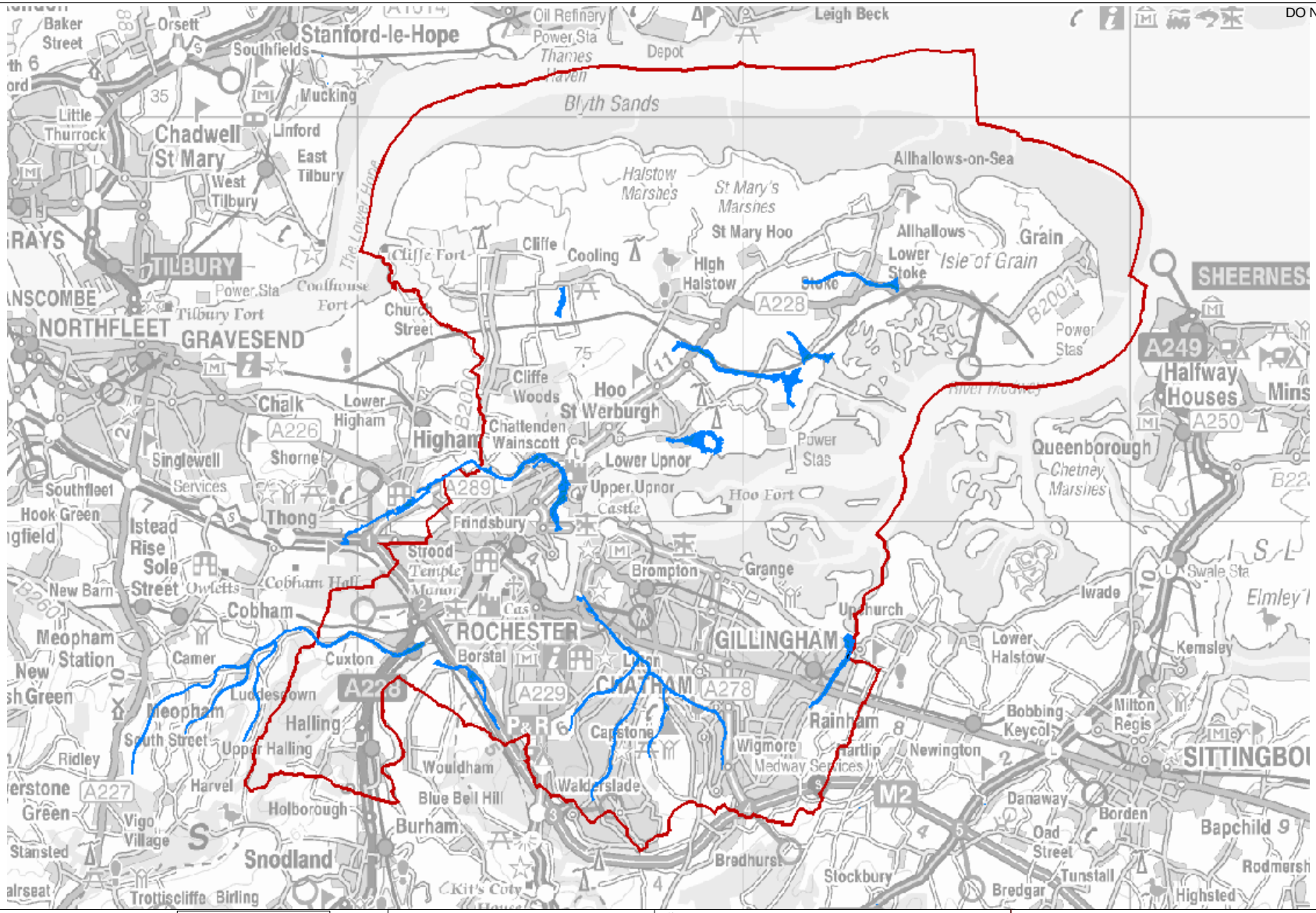

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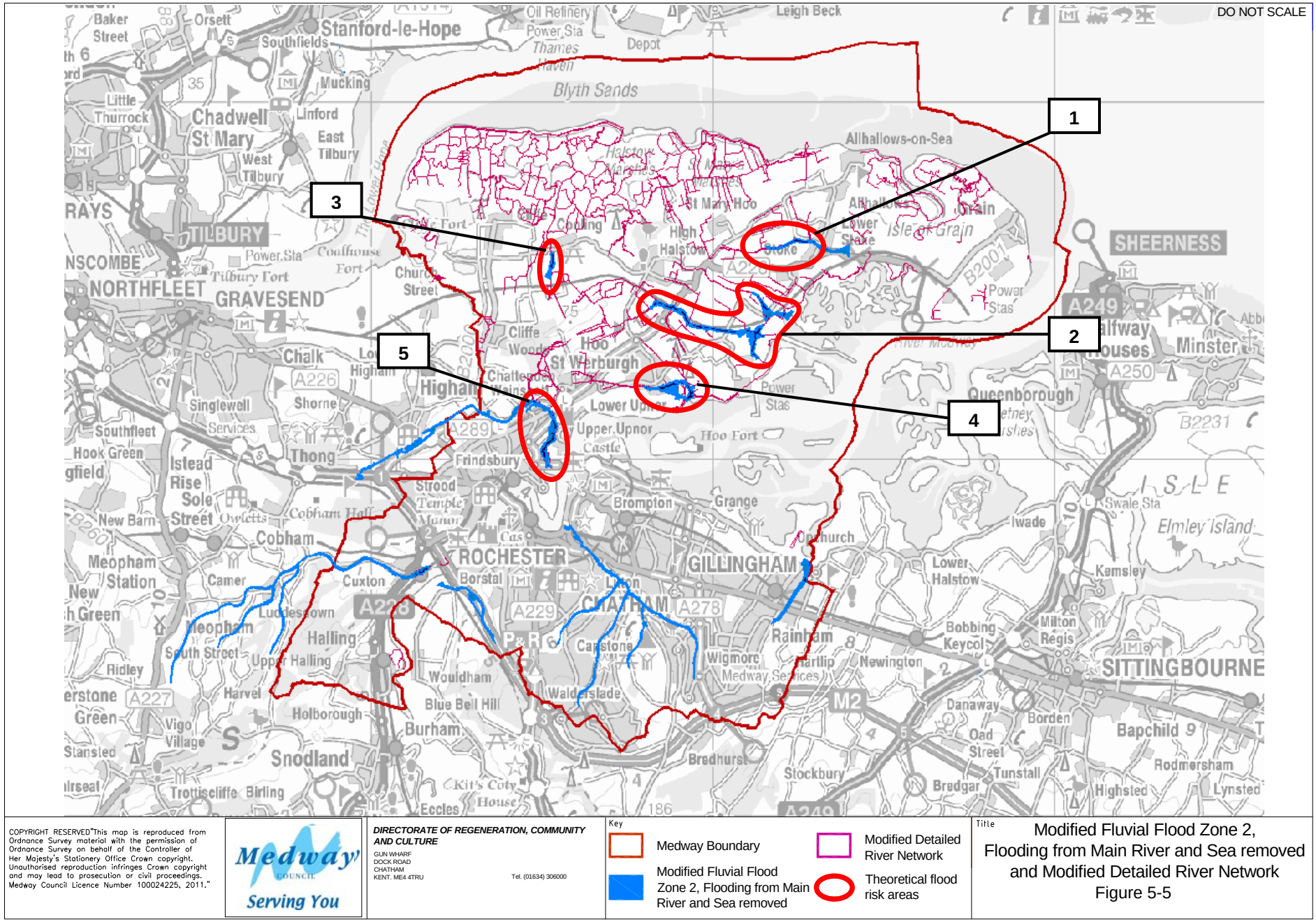
Key

- Medway Boundary
- Flood risk areas

Title

Modified Fluvial Flood Zone 2
Flooding from Main River and Sea removed

Figure 5-4



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Key

- Medway Boundary
- Modified Fluvial Flood Zone 2, Flooding from Main River and Sea removed
- Modified Detailed River Network
- Theoretical flood risk areas

Title

Modified Fluvial Flood Zone 2, Flooding from Main River and Sea removed and Modified Detailed River Network
Figure 5-5

5.2 Potential consequences of future flooding

To assess the potential consequences of flooding, the Environment Agency, Defra and WAG have idenitifed flood risk indicators in the following categories:

- human health
- economic activty
- environment.

These indicators are used to identify significant consequences of future flooding. The categories can be broken down into more detail, as shown in Figure 5-6.

Figure 5-6: Key flood risk indicators

Impacts of flooding on:	Flood risk indicators
Human health	Number of residential properties. Critical services (Hospitals, Police/Fire/Ambulance stations, Schools, Nursing homes, etc).
Economic activity	Number of non-residential properties. Length of road or rail. Area of agricultural land.
Cultural heritage	Cultural heritage sites (World Heritage Sites).
Environment	Locally, Nationally and Internationally Designated sites.

EA guidance suggests that “LLFAs focus this summary on their locally agreed surface water information (in this instance the FMfSW dataset) including other sources where appropriate. FMfSW (based on the scenario of deep flooding from a rainfall event with a 1 in 200 chance of occuring in any year), is therefore being used as the main dataset for the assessment of potential consequences, as explained in section 5.1. In addition this section assesses risk from Ordinary Water Course sources

Insufficient data exists regarding future risk of Groundwater flooding to make a useful assessment. The Areas Susceptable to Groundwater Flooding Map is very broad and innaccurate in defining areas at risk (it’s based on 1km squares) and gives no indication of depth.

The key risk indicators above have been assessed and an explanantion and assessment detailed below in Figures 5-6 and 5-7, and in Annex 2 of the preliminary assessment spreadsheet.

Figure 5-7. Potential consequences of future flooding from Surface Water.

Impacts of flooding on	Flood risk indicators		Potential harmful consequence
Human Health	Number of residential properties	Using figures calculated by the EA as part of the national exercise to identify areas above the flood risk threshold the total number of residential properties potentially at risk of deep surface water flooding is 13,700 (approximately 10% of Medway's 126859 residential properties) equating to potentially 32058 people at risk (using the national occupancy rate of 2.34 people per dwelling).	Yes
	Critical Services	Using figures calculated by the EA as part of the national exercise to identify areas above the flood risk threshold there are approximately 59 Critical Infrastructure services potentially at risk of deep surface water flooding. (Taken from Places above threshold data where >1 critial infrastructure recorded.)	Yes
Economic Activity	Number of non-residential properties.	Using figures calculated by the EA as part of the national exercise to identify areas above the flood risk threshold the total number of non-residential properties potentially at risk of deep surface water flooding is 2,300.	Yes
	Length of rail	A visual assessment of future flood risk from surface water to railway lines has been completed using the FMfSW 1:200 Deep data. Of the 8 areas of intersection between railway line and the FMfSW, none were considered to be at risk of significant harmful consequence. With the exception of one area all such intersections are embanked, on a bridge, or are situated at the top of sufficient local gradient for there to be no risk of flooding. The exception, an area South East of High Halstow where the line crosses Ratcliffe Highway, is a very wide cutting with excellent drainage. This line has no third rail and is therefore only suitable for diesel locomotives. There is, therefore, no risk of significant harmful consequence to Rail infrastructure from surface water flooding.	No

	Length of road	A visual assessment of future flood risk from surface water to main roads has been completed using the FMfSW 1:200 Deep data. Of the 15 areas of intersection between road and the FMfSW, none are considered to be at risk of significant harmful consequence. This is because the road; • is located above a gradient, or is on a bridge where flooding is unlikely or impossible, or • has pumped drainage with sufficient capacity to remove excess surface water, or • has recently had drainage outfall repairs, or • has new drainage, or • has water levels controlled by the EA by sluices, or • has been re-aligned or replaced with new highways infrastructure negating the risk of flooding. Some very minor roads are shown to be at potential risk, though these are not of enough strategic importance to be of consideration in this exercise. The risk to roads is not considered to be of significant harmful consequence.	No
	Area of agricultural land.	Using the NRD Agricultural Land Classification layer, there are agricultural areas from grade 1 (best quality) to grade 5 (poorest quality) across Medway, some of which are potentially affected by surface water flooding. Flooding is likely to be of benefit to these areas and not be of significant harmful consequence.	No

Cultural Heritage	Cultural heritage sites (World Heritage Sites).	Medway contains 79 Scheduled Ancient Monuments (SAMs). Using data supplied by the EA in the form of “Scheduled monuments at risk of flooding per 1km grid square” (Map SM26), derived from the FMfSW and NRD it can be calculated that a maximum of 24 may be at potential future flood risk. Of these 24 buildings many fall on the very edge of such areas. It is therefore difficult to accurately assess potential future flood risk through a desktop exercise. Local knowledge of these sites reveals that all are in areas with sufficient drainage to mitigate the risk of harm from future flood events. Medway has no World Heritage Sites, though is applying for World Heritage Status for Fort Amherst and Chatham Historic Dockyard, neither of which are substantially affected by areas shown as at risk in the FMfSW. Medway has 1 National Trail, the North Downs Way. This does intersect with areas shown as at risk in the FMfSW in several places, but not in a way that would indicate substanial risk. For the reasons given above it is assessed that there is no risk of significant risk of harmful consequence to Medway’s Cultural Heritage from Surface Water Flooding.	No
Environment	Local Designation	8 sites in Medway have been designated by Natural England, of which 1 falls within an area potentially at risk of deep surface water flooding . The site, Fox Burrow Woods in Rainham is not considered to be of significant harmful consequence	No
	Miscellaneous Designation	15 sites in Medway have been designated by the RSPB and Natural England. These open spaces and reed beds border the estuary on the peninsula. The sites are not, therefore considered to be at risk from future surface water flooding.	No
	National Designation	Medway has 1 site designated as an National Nature Reserve (NNR); Northwood Hill near High Halstow, and 2 Areas of Outstanding Natural Beauty (AONB); either side of the River Medway near Cuxton and Wouldham. Although some of these areas intersect with areas potentially at risk of deep surface water flooding, none are considered to be of significant harmful consequence.	No
	Policy Designation	Medway has 72 sites desiganted as Ancient Woodland, Fenns or Environmentally Sensitive Areas. Although some of these areas are potentially at risk of deep surface water flooding, none are considered to be of significant harmful consequence.	No

The vast majority of the Environmentally Designated sites above are grazing marsh and wetlands. By definition they are prone to flooding and are not suitable for other types of agriculture. Flooding will, therefore, be of likely benefit in sustaining these important rural habitats rather than being of harmful consequence.

Figure 5-7. Potential consequences of future flooding from Ordinary Watercourses

Future flood risk from Ordinary Watercourses has been assessed using data from Figure 5-5. This map shows areas of the Flood Map (Flood Zone 2) that cover ordinary watercourses that Medway are responsible for. This map shows 5 areas that are shown to be potantially at risk of flooding, numbered as follows;

1. Area near and around Lower Stoke
2. Area near Kingsnorth
3. Area near Cooling
4. Area near Hoo
5. Area near Wainscott and Hoo

Impacts of flooding on	Flood risk indicators		Potential harmful consequence
Human Health	Number of residential properties	The NRD does not differentiate between Residential and Non-residential property. Although the figures below combine the two the vast majority of property in these rural and suburban areas (an estimated 97%) are known to be residential. For this reason the combined figures are used to estimate future flood risk from Ordinary Watercourses as follows; 1. 104 properties 2. 24 properties 3. 0 properties 4. 78 properties 5. 39 properties A total of 245 properties are, therefore at potential risk from Ordinary Watercourse flooding, equating to potentially 573 people at risk (using the national occupancy rate of 2.34 people per dwelling). **This risk is considered to be of significant harmful consequence.**	Yes
	Critical Services	Using the NRD no Critical Services were shown to be at risk in the 5 areas of potential risk from Ordinary Watercourse flooding	No

Economic Activity	Number of non-residential properties.	Using the same NRD figures as used above in the “Human Health” category, and local knowledge of areas 1 to 5 shows, non-residential property numbers can be estimated as follows 1. 5% x 104 total properties = 6 non-residential properties 2. 2% x 24 total properties = 1 non-residential properties 3. 0 properties 4. 2% x 78 total properties = 3 non-residential properties 5. 0% x 39 properties = 0 non-residential properties Using this method approximately a total of 10 properties are potentially at risk from Ordinary Watercourse flooding. This risk is not considered to be of significant harmful consequence.	No
	Length of rail	A visual assessment of ordinary watercourse risk to railways has been completed using a visual assesment of Figure 5-5. Of the 3 areas of intersection between railway line and the Flood Map (Flood Zone 2), none were considered to be of significant harmful consequence. With the exception of one area all such intersections are embanked, on a bridge, or are situated at the top of sufficient local gradient for there to be no risk of flooding. The exception, an area South East of High Halstow where the line crosses Ratcliffe Highway, is a very wide cutting with excellent drainage. This line has no third rail and is therefore only suitable for diesel locomotives. The risk to railways is therefore not considered to be of significant harmful consequence.	No

	Length of road	A visual assessment of ordinary watercourse risk to main roads has been completed using a visual assesment of Figure 5-5. Of the 8 areas of intersection between road and the Flood Map (Flood Zone 2), none are considered to be at risk of significant harmful consequence. This is because the road; • is located above a gradient, or embankment, or is on a bridge where flooding is unlikely or impossible, or • has new drainage, or • has water levels controlled by the EA by sluices. Some very minor roads are shown as potentially at risk, though these are not of enough strategic importance to be of consideration in this exercise. The risk to roads is therefore not considered to be of significant harmful consequence.	No
	Area of agricultural land.	Using the NRD Agricultural Land Classification layer, there are agricultural areas from grade 1 (best quality) to grade 5 (poorest quality) across Medway, some of which are potentially affected by surface water flooding. Flooding is likely to be of benefit to these areas and not be of significant harmful consequence.	No
Cultural Heritage	Cultural heritage sites (World Heritage Sites).	Only 1 listed building exists within the 5 areas of potential flood risk; Sole Street, near Frindsbury Extra Farm. This site is not considered to be at risk of significant harmful consequence.	No
Environment	Local Designation	No areas within Medway are designated in this category	No
	Miscellaneous Designation	No areas within Medway are designated in this category	No
	National Designation	No areas within Medway are designated in this category	No

	Policy Designation	Areas designated in this category are as follows 1. An Environmentally Sensitive Area touches the edge of the Flood Map. 2. None 3. None 4. None 5. None This site is not considered to be at risk of significant harmful consequence.	No
	International Designation	Areas designated in this category are as follows 1. None 2. An area designated SSA, SSSI and RAMSAR has been identified in the Flood Map. 3. None 4. An area designated SSA, SSSI and RAMSAR has been identified in the Flood Map. 5. None This site is not considered to be at risk of significant harmful consequence.	No

5.3 Effect of climate change and long term developments

Section 5.3 is a mandatory excerpt from the Environment Agency's PFRA report template.

The evidence

There is clear scientific evidence that global climate change is happening now. It cannot be ignored. Over the past century around the UK we have seen sea level rise and more of our winter rain falling in intense wet spells. Seasonal rainfall is highly variable. It seems to have decreased in summer and increased in winter, although winter amounts changed little in the last 50 years. Some of the changes might reflect natural variation, however the broad trends are in line with projections from climate models. Greenhouse gas (GHG) levels in the atmosphere are likely to cause higher winter rainfall in future. Past GHG emissions mean some climate change is inevitable in the next 20-30 years. Lower emissions could reduce the amount of climate change further into the future, but changes are still projected at least as far ahead as the 2080s.

We have enough confidence in large-scale climate models to say that we must plan for change. There is more uncertainty at a local scale but model results can still help us plan to adapt. For example we understand rain storms may become more intense, even if we can't be sure about exactly where or when. By the 2080s, the latest UK climate projections (UKCP09) are that there could be around three times as many days in winter with heavy rainfall (defined as more than 25mm in a day). It is plausible that the amount of rain in extreme storms (with a 1 in 5 annual chance, or rarer) could increase locally by 40%.

Key projections for Thames River Basin District

If emissions follow a medium future scenario, UKCP09 projected changes by the 2050s relative to the recent past are:

- winter precipitation increases of around 15% (very likely to be between 2 and 32%);
- precipitation on the wettest day in winter up by around 15% (very unlikely to be more than 31%);
- relative sea level at Sheerness very likely to be up between 10 and 40cm from 1990 levels (not including extra potential rises from polar ice sheet loss);
- peak river flows in a typical catchment likely to increase between 8 and 18%.

Implications for flood risk

Climate changes can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability. Wetter winters and more of this rain falling in wet spells may increase river flooding in both rural and heavily urbanised catchments. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers, so we need to be prepared for the unexpected.
Rising sea or river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses. There is a risk of flooding from groundwater-bearing chalk and limestone aquifers across the district. Recharge may increase in wetter winters, or decrease in drier summers.

Adapting to change

Past emissions mean some climate change is inevitable. It is essential we respond by planning ahead. We can prepare by understanding our current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits. Although the broad climate change picture is clear, we have to make local decisions uncertainty. We will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that we do not increase our vulnerability to flooding.

Long-term developments

It is possible that long-term developments might affect the occurrence and significance of flooding. However current planning policy aims to prevent new development from increasing flood risk.

In England, Planning Policy Statement 25 (PPS25) on development and flood risk aims to "ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall."

In Wales, Technical Advice Note 15 (TAN15) on development and flood risk sets out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is "to direct new development away from those areas which are at high risk of flooding."

Adherence to government policy ensures that new development does not increase local flood risk. However, in exceptional circumstances the Local Planning Authority may accept that flood risk can be increased contrary to government policy, usually because of the wider benefits of a new or proposed major development. Any exceptions would not be expected to increase risk to levels which are "significant" (in terms of the government's criteria).

6 Flood risk areas

6.1 Overview

Identifying flood risk areas

Information regarding historic and future flood risk has been used to formally identify Flood Risk Areas. To achieve this, flood risk indicators (as described in Section 5.2) were used to determine the impacts of flooding on human health, economic activity, cultural heritage and the environment.

In order to ensure a consistent national approach, Defra have identified significance criteria and thresholds to be used for defining flood risk areas using these flood risk indicators. Guidance on applying these thresholds has been released in Defra's document "Selecting and reviewing Flood Risk Areas for local sources of flooding". In this guidance document, Defra have set out agreed key risk indicators and threshold values that must be used to determine Flood Risk Areas.

The Flood Map for Surface Water (based on the scenario of deep flooding from a rainfall event with a 1 in 200 chance of occurring in any year) and the National Receptors Dataset (NRD) as the primary information sources for defining the indicative Flood Risk Areas.

Places above the Flood Risk Thresholds were determined. These are 1km squares where at least one of the following thresholds.

1) Number of people > 200
2) Critical services > 1
3) Number of non-residential properties > 20

These are shown in figure 6.1. Nine of the Places above the Flood Risk Threshold area squares are intersected by the boundary line between Medway and Kent County Council. These squares are shown highlighted in figure 6.1.

Where a cluster of these grid squares leads to an area where over 30,000 people are predicted to be at risk of flooding, this area has been identified as an Indicative Flood Risk Area. This guidance has now been released and the Environment Agency has applied it to identify Indicative Flood Risk Areas across the country. Of the ten (10) national Indicative Flood Risk Areas, one falls within Medway Council's administrative boundary, as shown in Figure 6-2 below.

The Indicative Flood Risk Area proposed crosses the boundary line between Medway LLFA and Kent County Council LLFA.

In this case the EA asked that we, by mutual agreement with KCC either,

- Agree which LLFA would take responsibility for that square based on flood risk to each authority and amend the Indicative Flood Risk Area accordingly or,
- Amend the Indicative Flood Risk Area to follow the LLFA boundary line and each LLFA takes responsibility for those areas within their LLFA boundary.

The latter was chosen by agreement with KCC. This amended Flood Risk Area is shown in Figure 6.3.

It is felt that the Indicative Flood Risk Area and amended Flood Risk Area falls within the Medway boundary by virtue of its population density, and as a result of the Environment Agency's assumption of local drainage rate in modelling surface water, rather than through a robust case that demonstrates actual risk. Although the actual drainage rate is not known, it is estimated to be significantly higher than that used in the model used to identify the Indicative Flood Risk Area.

This report has identifed that there is potential risk of surface water flooding and ordinary watercourse flooding which has the potential to cause "significant harmful consequence". There are limitations associated with the data currently available to assess future flood risk, particularly for Medway as explained within the report. Insufficient evidence exists to support or contest the Indicative flood Risk Area. Medway Council, therefore accepts the Flood Risk Area shown in Figure 6-3.

Future mapping of Flood Risk will, therefore include surveys and modelling to quantify any risk. The formation of a Medway Flood Group will ensure a uniformity of data quality and a definition of, and adherance to best practice that will enable more accurate indications of actual flood risk areas.

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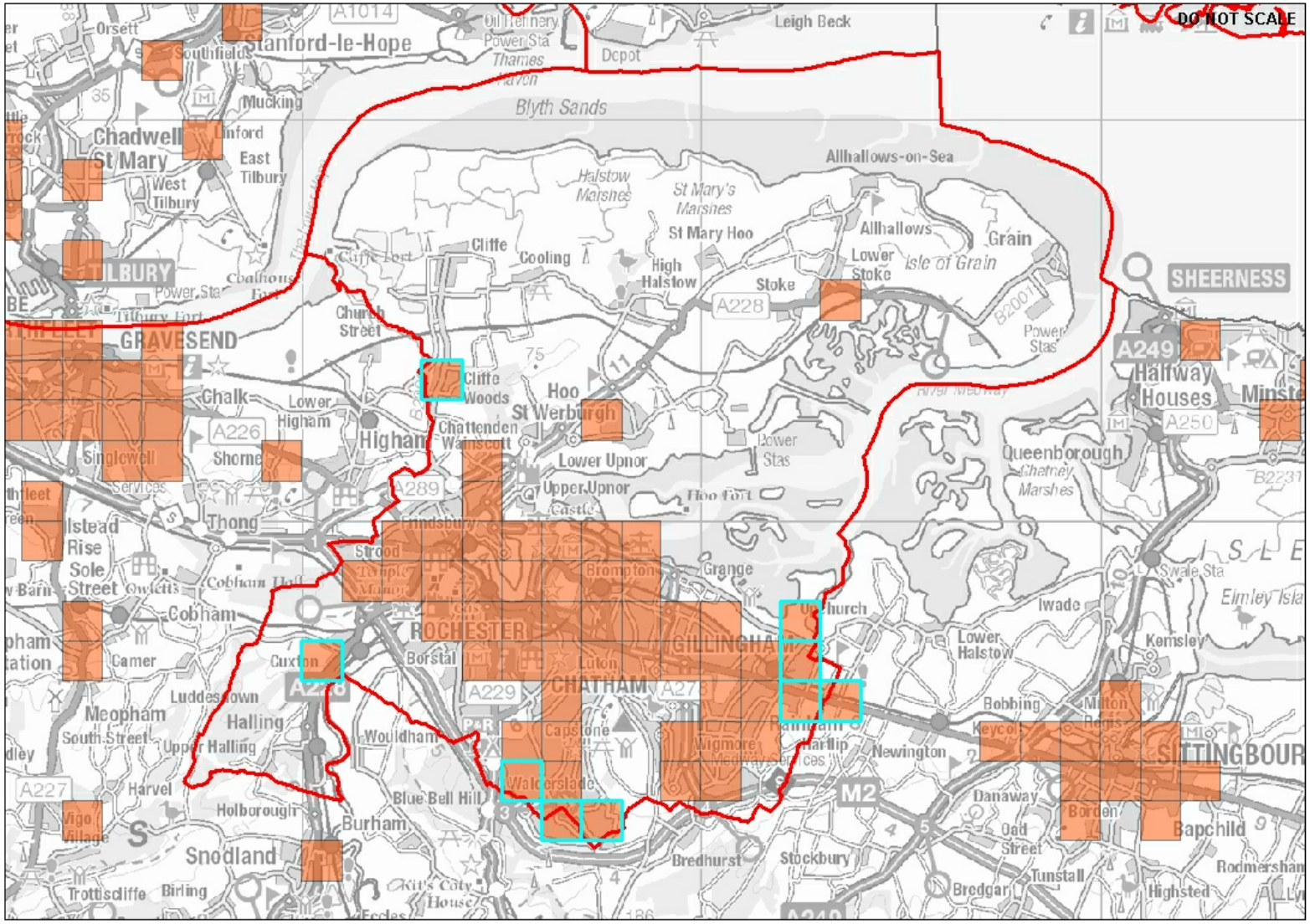

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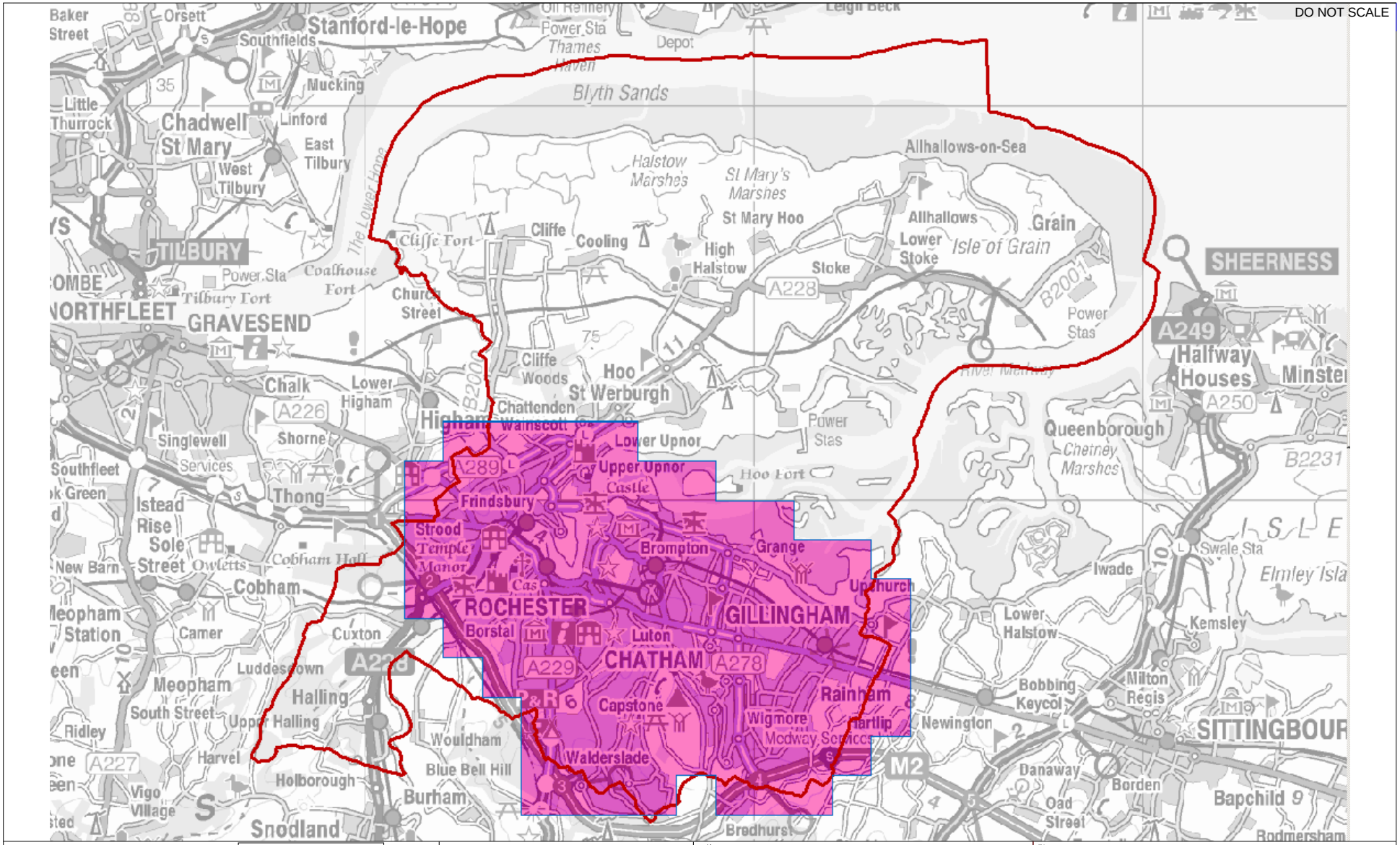
Key

Medway Boundary

Areas Above the Flood Risk Threshold

Title

Places Above the Flood Risk Threshold
Figure: 6-1



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Key

Medway Boundary

Indicative Flood Risk Area

Title

Indicative Flood Risk Areas
Figure: 6-2

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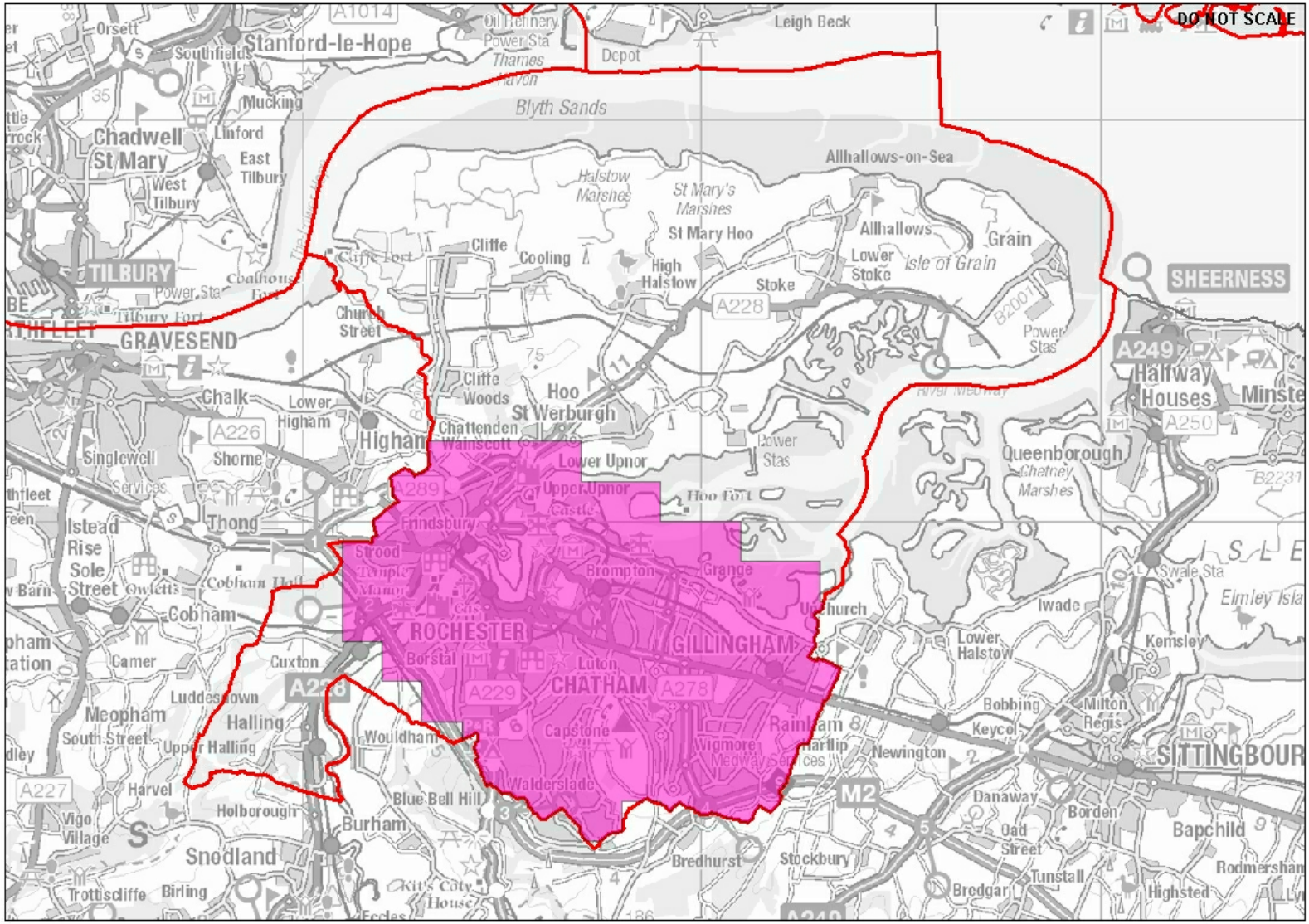

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Key

Medway Boundary

Indicative Flood Risk Area

Title

Amended Indicative Flood Risk Areas
Figure: 6-3

7 Next steps

7.1 Future data management arrangements

In order to continue to fulfil their role as Local Lead Flood Authority, Medway Council is required to investigate future flood events and ensure continued collection, assessment and storage of flood risk data and information. It is crucial that all records of flood events are documented consistently and in accordance with the INSPIRE Directive (2007/2/EC). It is recommended that a centralised database will be kept up to date by Medway Council, who have the overall responsibility to manage flood data through the whole administrative area. This can be used as an evidence base to inform future assessments and reviews and for input into the mapping and planning stages.

Future Flood Group meetings will discuss efficient methods of ongoing data gathering and communication as a priority, as well as assessing and mapping and planning for future flood risk,

Medway Council is already working with the SE7 group of authorities to develop a standardised approach to data collection relating to future flood events, including the collection of data using a publically accessible web portal.

7.2 Scrutiny and review procedures

The scrutiny and review procedures that must be adopted when producing a PFRA are set out by the European Commission. Meeting quality standards is important in order to ensure that the appropriate sources of information have been used to understand flood risk and the most significant flood risk areas are identified. Another important aspect of the review procedure is to ensure that the guidance is applied consistently; a consistent approach will allow all partners to understand the risk and manage it appropriately. The scrutiny and review procedure will comprise two key steps, as discussed below.

Local authority review

The first part of the review procedure is through an internal local authority review of the PFRA, in accordance with appropriate internal review procedures. Internal approval should be obtained to ensure the PFRA meets the required quality standards, before it is submitted to the Environment Agency. Within Medway, the PFRA will be presented to the Regeneration and Community and Culture Overview and Scrutiny Committee for approval before submission to the Environment Agency in draft form. Following their review and comments a final version will be re-submitted in August 2011, and to the Portfolio holder of Front Line Services before final submission to the EA.

Environment Agency review

Under the Flood Risk Regulations, the Environment Agency has been given a role in reviewing, collating and publishing all of the PFRAs once submitted. The Environment Agency will undertake a technical review (area review and national review) of the PFRA, which will focus on instances where Flood Risk Areas have been amended and ensure the format of these areas meets the provide standard. If satisfied, they will recommend submission to the relevant Regional Flood Defence Committee (RFDC) for endorsement. RFDCs will make effective use of their local expertise and ensure consistency at a regional scale. Once the RFDC has endorsed the PFRA, the relevant

Environment Agency Regional Director will sign it off, before all PFRAs are collated, published and submitted to the European Commission. The first review cycle of the PFRA will be led by Medway Council and must be submitted to the Environment Agency by 22 June 2011. They will then submit it to the European Commission by 22 December 2017 using the same review procedure described above.

The EA has nationally relaxed the 22 June deadline to allow for pressures relating to the local election process. A submission of a working draft will be made to the the EA on or before the 22nd June.

8 References

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Annexes

Annex 1: Records of past floods and their significant consequences (Preliminary Assessment Spreadsheet)

Please refer to Annex 1 of the Preliminary Assessment Spreadsheet attached with this report. Due to the lack of data available regarding the consequences of past flooding ,as discussed in Chapter 4.3, no flood events have been considered to have significant harmful consequences, so none have been recorded in this section.

Annex 2: Records of future floods and their significant consequences (Preliminary Assessment Spreadsheet)

Please refer to Annex 2 of the Preliminary Assessment Spreadsheet attached with this report. This spreadsheet includes a complete record of future flood risk within Medway, including details of the potential consequences of flooding to key risk receptors within the county.

Annex 3: Records of Flood Risk Area and its rationale (Preliminary Assessment Spreadsheet)

Please refer to Annex 3 of the Preliminary Assessment Spreadsheet attached with this report. No flood risk area has been identified.

Annex 4: Review Checklist

Please refer to Annex 4, attached to this report, which contains the Review Checklist that has been provided by the Environment Agency to act as a checklist for reviewing PFRA submissions.

Annex 5 - Historic Flood Event Data

Please refer to Annex 6, attached to this report, which contains a spreadsheet detailing all Historic Flood Event Data submitted by Medway Council Highways Department, Lower Medway Internal Drainage Board, Southern Water and Kent Fire and Rescue Service. Although the 11 parishes were asked for data none was given, and therefore none from this source can be included in this section.