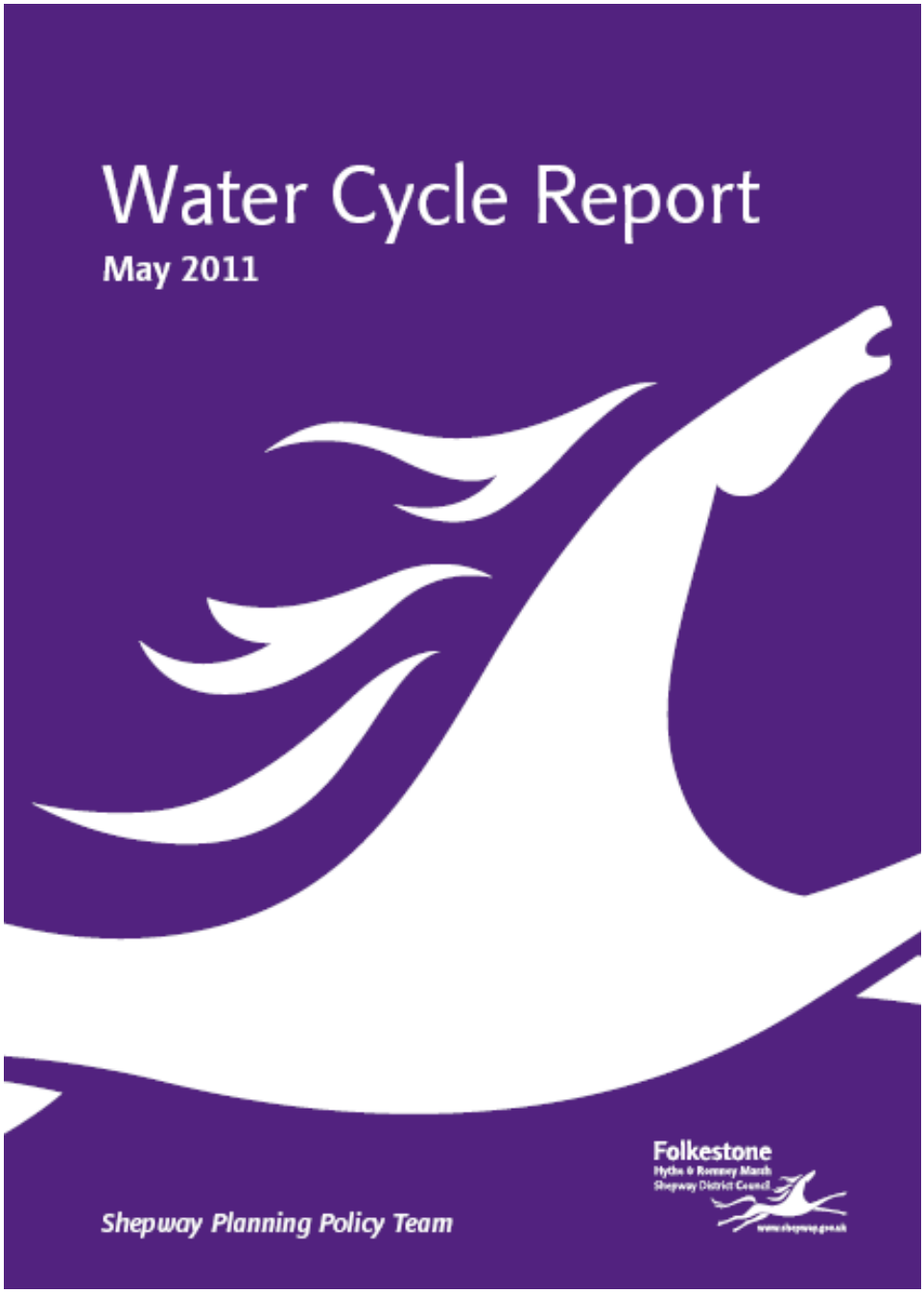

Consultation Draft

Prepared by	Piran Cooper, Planning Policy Officer
Reviewed by	Mark Aplin Planning Policy Team Leader
Agreed by	

Shepway Water Cycle Report

This report has been produced by the council in association with the Environment Agency. Veoila Water SE (formerly Folkestone and Dover Water Services Ltd.) and Southern Water have been consulted during its preparation. Additional information specifically relating to flood risk has been produced by Herrington Consultancy.

Important Water Cycle Report Note:
The Water Cycle Report is produced to inform the district's Local Development Framework and is not considered material to any planning application. Views expressed are officer opinion only.

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Glossary of Terms

Term	Definition
AMP5	AMP is an 'Asset Management Plan' within the water industry. AMP5 refers to the 5 year planning period for 2010-2015
Aquifer	An underground layer of water-bearing permeable rock or unconsolidated materials such as silt gravel or clay from which groundwater can be extracted
Abstraction, (also referred to as water extraction or groundwater abstraction)	The process of taking water either permanently or temporarily from a source
Artificial Water Body	Surface water bodies which have been created in a location where no water body existed before and which have not been created by the direct physical alteration, movement or realignment of an existing water body
Baseflow, (also referred to as groundwater flow, or dry-weather flow)	Water resulting from precipitation that infiltrates into the soil and eventually moves through the soil to the stream channel
Catchment Abstraction Management Strategy (CAMS)	Six year plans that detail water management within a designated area
Code for Sustainable Homes	This is an environmental impact rating system for housing in England & Wales, setting standards for energy efficiency and sustainability
Catchment	An area of land where water from rain or melting snow or ice drains downhill into a body of water. The drainage basin includes streams, rivers and land that convey water into those channels
Diffuse pollution	Polluting substances that cannot be traced back to an exact source, occurs when potentially polluting substances leach into surface water and groundwater as a result of rainfall, soil infiltration and surface runoff
Diffuse pollution sources	Agriculture, transport and construction are examples of potential sources for diffuse pollution
Discharge	Water that is emitted by a process back into natural hydrological systems
Dry Weather Flow	When the sewage flow is mainly domestic in character, the average daily flow to the treatment works during seven consecutive days without rain following seven days during which the rainfall did not exceed 0.25mm on any one day. Usually taken as 200 litres per head per day on domestic properties
Flood Zones (Environment Agency)	High level information on the type and likelihood of flood risk in any area of the country; classified as follows:

	Zone 1 - Low probability of flooding Zone 2 - Medium probability of flooding Zone 3 - High probability of flooding
Flood Hazard Zones (Strategic flood risk assessment)	In developing the Strategic flood risk assessment more detailed flood scenarios were calculated for the district. Low - Caution Moderate - Dangerous for some Significant Dangerous for most people Extreme - Dangerous for all
Flooding	See Table 8, 6.2.7 Flood Sources
Groundwater	Water located beneath the ground surface in soil pore spaces and in the fractures within rock or rock formations.
Headroom	For water supply this is the amount of water allocated in planning as a safety reserve to allow for a range of uncertainties. For waste water treatment it is the spare capacity within strategic infrastructure.
Heavily modified water body (HMWB)	Bodies of water which, as a result of physical alterations by human activity, are substantially changed in character and cannot, therefore, meet "good ecological status" (GES). In this context physical alterations mean changes to, e.g. the size, slope, discharge, form and shape of river bed of a water body.
Hydrogeology	The report of water flow in aquifers
Local reinforcement	Describes the works necessary to an existing network to enable a development to go ahead
Sequential test	Applied in accordance with Planning Policy Statement 25, used to demonstrate that there are no reasonable sites within an area with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
Sewage infrastructure (pipes works)	The sewerage network comprises local and strategic elements: local - connecting domestic properties through localised pipes to the main sewerage network strategic - major elements of infrastructure, including large pipes and wastewater treatment plants.
Strategic Flood Risk Assessment (SFRA)	Herrington Consulting has been commissioned by Shepway District Council in partnership with the Environment Agency to prepare a Strategic Flood Risk Assessment for the council. The report provides an analysis of the main sources of flood risk to the district, together with a detailed means of appraising development allocations and existing planning policies against the risks posed by coastal flooding over this coming century.
Soakaway	A method of water disposal (usually surface water) that disperses water from drains leading to it, provided surrounding soil conditions are suitable. A soakaway may consist for example, of a hole dug in the ground and then filled with brick, rubble or similar material, and covered over.
Special Protection Area (SPA)	SPAs are areas which have been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within European Union countries. They are European designated sites, classified under the ‘Birds Directive 1979’ which provide enhanced protection given by the Site of Special Scientific Interest (SSSI) status all SPAs also hold.

Groundwater Source Protection Zone	The delineation of a protection area around groundwater sources where they are used to supply drinking water. The zones show the risk of contamination from any activities that might cause pollution in the area.
River Basin Management Plans	River Basin Management Plans are plans for protecting and improving the water environment and have been developed in consultation with organisations and individuals. They contain the main issues for the water environment and the actions required to maintain/improve them.
Site of Special Scientific Interest (SSSI)	SSSIs give legal protection to the best sites for wildlife and geology in England. Natural England has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended).
Surface runoff	The water flow that occurs when soil is infiltrated to full capacity and excess water from rain, snowmelt, or other sources flows over the land.
Waste Water Treatment Works (WWTW)	Installations in which contaminants are removed from waste water and household sewage.
Waterbody	Any significant accumulation of water including: rivers, lakes and streams, ponds, puddles and wetlands.
Water table	The level at which the groundwater pressure is equal to atmospheric pressure. It may be conveniently visualized as the 'surface' of the groundwater in a given vicinity.
Water Framework Directive (WDF)	The European Water Framework Directive came into force in December 2000 and became part of UK law in December 2003. It gives us an opportunity to plan and deliver a better water environment, focusing on ecology. The Directive will help to protect and enhance the quality of: • surface freshwater (including lakes, streams and rivers) • groundwaters • groundwater dependant ecosystems • estuaries • coastal waters out to one mile from low water
Water Resource Management Plan (WRMP)	Following the Water Act 2003, water resources management plans are now statutory documents, which are submitted to the Secretary of State (DEFRA), and are made available for public consultation. These plans are prepared every five years. Veolia Water Southeast's Final Water Resources Management Plan (FWRMP) shows how the company intends to maintain the balance between available water supply and the demand for water over the next twenty five years.
Waste water treatment and abstraction	Incorporating physical, chemical and biological processes to remove physical, chemical and biological contaminants.

EXECUTIVE SUMMARY This report examines the issues relating to water within the context of the district and the physical characteristics of its hydrology. One of the primary reasons for producing this report was to investigate the potential impact of new growth proposed under the Local Development Framework Core Strategy. The report provides a simple analysis of the hydrology of the district in the context of the South East of England, a résumé of existing planning legislation and an overview of the Water Framework Directive, the primary piece of legislation that exists to protect the quantity and quality of water in the natural environment. Understanding the potential impact of new growth on existing resources and infrastructure is key to the provision of sound policy and so an analysis of the capacity of drinking water supply and waste water treatment is an important facet of the report. The topography of Shepway is also intrinsic in directing development, with Romney Marsh forming more then half of the district's land mass and lying below sea level, ensuring development is suitably located is imperative to sustainable development. Shepway is also a place with a rich ecology, with its most valued natural environments being heavily dependant on adequate supplies of clean water, an important consideration.

SECTION A – INTRODUCTION

This report is divided into Sections A, B and C. Section A explains the reasons why the council has prepared this document in the context of its work on the Local Development Framework Core Strategy. It also provides an explanation of the nature of the water cycle and how it is harnessed for use in our homes. The final chapter in this section relates water and water related issues to national and local planning policy. The purpose of Sections B and C is explained at the start of each section.

Chapter 1 AIMS & SCOPE OF THE REPORT

1.1 Report Aims

1.1.1 The council is currently preparing its Local Development Framework (LDF) Core Strategy, which will form the strategic planning policy document for the district up to and including 2026. It interprets national priorities in a local context, providing guidance on development such as infrastructure, housing, employment, protection of resources and the countryside. Water of sufficient quality and quantity and in the right place is a growing issue, which needs to be addressed in planning for development. The impact and causes of climate change also need to be taken into account in the council's plan-making process. This report aims to review and integrate the approach to water supply, waste water treatment, flood risk issues and biodiversity. It also addresses issues raised through LDF public participation, especially responses to Core Strategy 'Preferred Options' consultation.

1.2 Strategic Guidance through the Core Strategy

1.2.1 The Core Strategy will detail strategic policy for the district and the main local principles to achieve sustainable development. Shepway is a predominantly rural (historically with a strong agricultural and coastal focus) and water has played an important role in the way that its settlements and landscape has developed. Today water is increasingly seen as a precious commodity, important for industry and homes and therefore vital for the economic and social wellbeing of the district.

1.2.2 There is a recognised housing shortage in the region and housing provision is a significant issue locally, not least as significant new development is required to just meet the future accommodation needs of existing residents and families. Specifically, the need for new housing is underpinned by changing demographics within the district. The increase in the number of one-person households means several thousand new homes will be required for the indigenous population alone over the next twenty years, without allowing for new families settling in the district.

1.2.3 Moreover, the Strategic Housing Market Availability Assessment (SHMA)[1] details a need for development to address existing accommodation requirements. Within overall high demand, there is an acute shortfall in affordable housing to enable individuals and families on lower incomes access to decent housing. The LDF has a responsibility to plan to address needs for adequate housing, as detailed in government guidance, Planning Policy Statement 3: *Housing*[2].

[1] Ecotec (2009) Strategic Housing Market Assessment for East Kent – Final Report, Ecotec, Accessed on line, date accessed 23.03.10, Web site address: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

[2] DCLG (2006) Planning Policy Statement 3: Housing, HMSO, Accessed on line, date accessed 23.03.10, Web site address: http://www.communities.gov.uk/publications/planningandbuilding/pps3housing

1.2.4 In order to ensure that new policy is effective and deliverable the council needs to investigate issues that are relevant to emerging new policy. An important aspect of development is ensuring adequate infrastructure exists to enable it to take place, therefore maximising quality of life for residents and safeguarding the environment.

1.2.5 Planning Policy Statement 12: *creating strong safe and prosperous communities through Local Spatial Planning* recognises the importance of this aspect of planning policy; specifically it stipulates that "The outcome of the infrastructure planning process should inform the core strategy and should be part of a robust evidence base"[3].

1.2.6 Other relevant evidence in preparation for the LDF, and utilised in this document includes:

- **Strategic Flood Risk Assessment** - prepared in association with PPS 25: Flooding and developing existing Environment Agency (EA) flood risk maps
- **Sustainability Appraisal** - Covers wide environmental issues, alongside social and economic concerns.
- **Habitat Regulations Assessment** - This report evaluates the impact on new policy on sites of European interest (known as Natura 2000 sites). It includes sites beyond the district boundary that could potentially be affected by policy within Shepway. The ultimate goal of a Habitat Regulations Assessment is to safeguard/improve important habitats and their flora and fauna.
- Generic infrastructure and strategic site planning

1.2.7 As the importance of natural water resources/assets has become more recognised, the issue of water provision and treatment in southeast England has become more contentious. Accordingly, this document demonstrates consideration of water in the local environment to help shape the LDF through the council working in conjunction with its partners who have primary responsibility for water management.

1.2.8 Specifically this report will:

- Recognise and understand the importance of the hydrological cycle for the district
- Understand the role of planning policy in relation to the efficient use of water
- Examine the function of the Water Framework Directive in the context of Shepway, including surface water, groundwater and coastal waters
- Investigate water supply in relation to new planning policy
- Investigate waste water treatment in relation to new planning policy

[3] DCLG (2008) Planning Policy Statement 12: creating strong safe and prosperous communities through Local Spatial Planning, Section 4.10, DCLG, Section 4.10, Accessed on line, date accessed 04.02.11, Web site address: http://www.communities.gov.uk/documents/planningandbuilding/doc/pps12.doc

- Summarise strategic issues within the council's Strategic Flood Risk Assessment, draft Sustainability Appraisal, emerging Habitats
- Regulation Assessment and acknowledge work undertaken in association with the Shoreline Management Plan.
- Determine or provide a procedure for determining what water-related infrastructure is required and where in the context of the emerging LDF Core Strategy.

1.2.9 In order that the report achieves these aims it has been prepared in close association with stakeholders who have a significant interest in water in the district. As such the council has identified the Environment Agency (EA), Veolia Water SE (formerly Folkestone and Dover Water Services Ltd.) and Southern Water as essential partners in the development of this investigation. The Environment Agency has overall responsibility for the protection of the amount and quality of water in natural systems and flood risk, but does so in conjunction with key partners, including the local planning authority. Veolia Water SE is responsible for water supply through most of the district, including the more populated areas. South East Water is responsible for public water supply on the western edge of Romney Marsh and the northern tip of the district. Southern Water (SW) is responsible for waste water treatment throughout Shepway. In addition the council also liaised with or utilised information from other organisations such as Herrington Consultancy Ltd which was responsible for the development of the Strategic Flood Risk Assessment for Shepway.

1.2.10 This report derives much of its content from publications from the aforementioned organisations, which are applied here in the context of Core Strategy and the physical characteristics of the district.

1.2.11 The report will be used as part of the evidence base for the LDF Core Strategy, **and is an important document providing an 'integrative' role, bringing together technical studies from a district specific perspective and forming joint conclusions to guide the LDF and spatial planning.**

1.3 Terms of Reference

1.3.1 This report examines water in relation to Shepway and the growth scenarios that are proposed under the emerging LDF Core Strategy. The scope of the document generally responds to EA guidelines.

1.3.2 The EA guidance suggests that a water cycle study poses specific questions. Those considered important in the context of this report include:

- **Question 1: Is there enough water?** – This issue is largely dealt with within Chapter 5, which looks at how water resources are managed.
- **Question 2: Will there be a water quality impact?** – This is an especially important consideration within Shepway as many of the district's most important ecological sites are aquatic. Sustainable development underpins the planning system and is inherent in many aspects of planning policy, this is also dealt with in Chapter 5. Dedicated legislation to safeguard water resources is expressed through the Water Framework Directive. Chapter 4 explains the implications of this for ground and surface waters in the context of the Stour and Rother River basins that cover Shepway. The district's coastal waters are also important and are covered within this Section.
- **Question 3: Can development be accommodated without increasing flood risk?** – As 55% of the district is at or below sea level, consideration of flood risk is an important aspect of planning. Chapter 6 examines this, drawing from the council's strategic flood risk assessment and shore line management plans.

1.3.3 These questions cover the central issues of water availability, water quality and flood risk management that are all of pertinence to Shepway.

1.3.4 The EA raises other issues which relate to its own area of competence, such as other environmental risks or more detailed water information or primary research. These are all potentially relevant to the planning system, but will normally be picked up at the stage specific information is available, such as in preparing planning applications. This report is inspired by the central principle of the sustainable use of water, a collected examination of all key water related issues in the management of the environment, but it is designed to inform strategic planning.

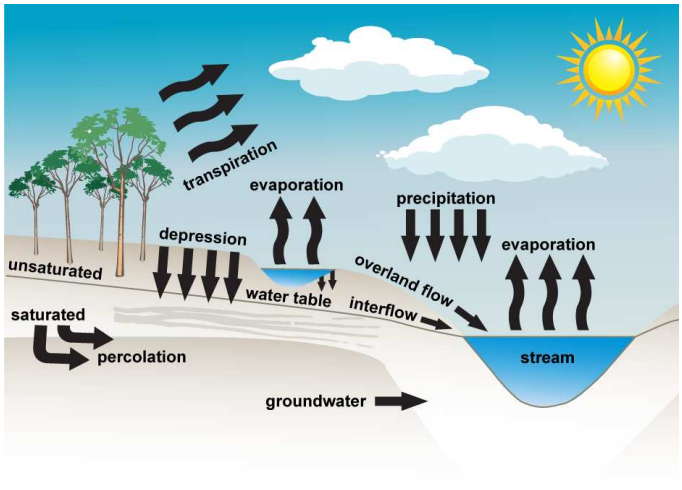
Chapter 2 AN OVERVIEW OF WATER SYSTEMS & LOCAL FEATURES

2.1 Introduction

2.1.1 The United Nations state[4]: *"Water is the lifeblood of the planet and the state of the resource affects all natural, social and economic systems. Water is the fundamental link between the climate system, human society and the environment."* As our drinking water is sourced from natural systems it is useful to include an overview of this, which is provided below. The examination of inland watercourses and infrastructure is complemented by an overview of coastline management issues. At the outset of this report, it is important to highlight the natural connections between these features and the environment.

2.2 The Hydrological Cycle

2.2.1 Figure 1.0 - Diagram of the Hydrological Cycle



2.2.2 Uninterrupted by human interventions, water will flow through the ground into rivers and streams and ultimately to the sea. At the same time the processes of evapotranspiration return water vapour to the atmosphere from where it will condense to fall as rain, forming a continuous cycle. This is known as the hydrological cycle.

2.2.3 This process will be affected by many factors such as geology, topography, soils and vegetation cover. It is from this cycle that fresh water is obtained and treated waste water deposited. Obviously there are not just human demands on the water in the natural environment; it is essential for all forms of life and its abstraction has to be managed sustainably.

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[4] Unesco (2009) The United Nations World Water Assessment Programme *The Implications of Climate Change on Water: Highlights on climate change from the UN World Water Development Report 3: Water in a Changing World,* Unesco, Accessed on line, Date Accessed 31.01.11, Web site address: http://unesdoc.unesco.org/images/0018/001863/186317e.pdf

2.2.4 Figure 2.0 - Human Demands on the Hydrological Cycle

The following diagram illustrates the issues that relate to water resources and water supply, waste water collection and treatment.

Water Resources and Water Supply

Environmental

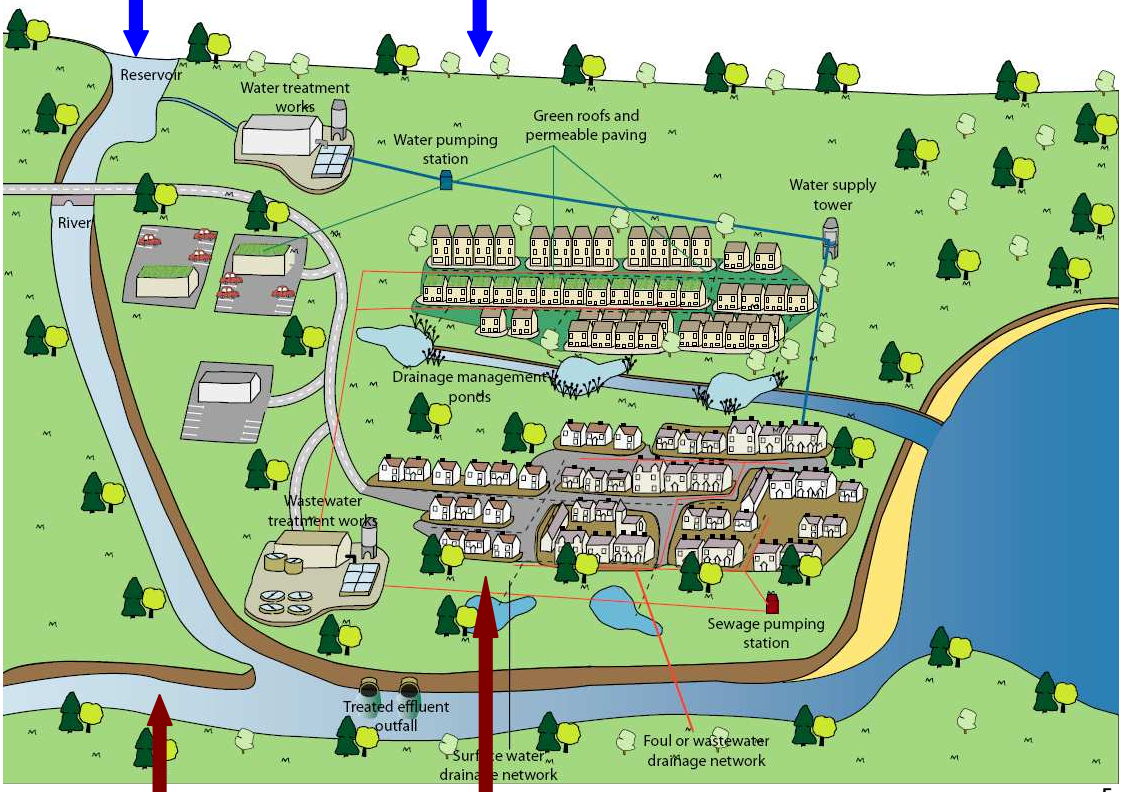
Environmental capacity is the amount of water that can be abstracted before there are harmful environmental impacts. The environmental capacity of a water system is covered within Chapter 4 - The European Water Framework Directive.

Infrastructure

Infrastructure capacity is the ability of the water supply system to supply water to homes and businesses. Issues relating to infrastructure are covered Chapter 5 - Water Resources & Waste Water Treatment

Flood Risk Management

Flood risk must be managed through compliance with PPS25. New development should be directed away from areas of highest risk. Where this is not possible, flood resilience measures may be required. Flood risk must not be increased elsewhere. See Chapter 6 Flooding & Coastal Issues



5

Environmental

Environmental capacity is the required water quality to protect wildlife environments. This is covered within Chapter 4 - The European Water Framework Directive.

Infrastructure

Infrastructure capacity is the ability of the wastewater system to collect, transport and treat wastewater from homes and Businesses. See Chapter 5 - Water Resources & Waste Water Treatment

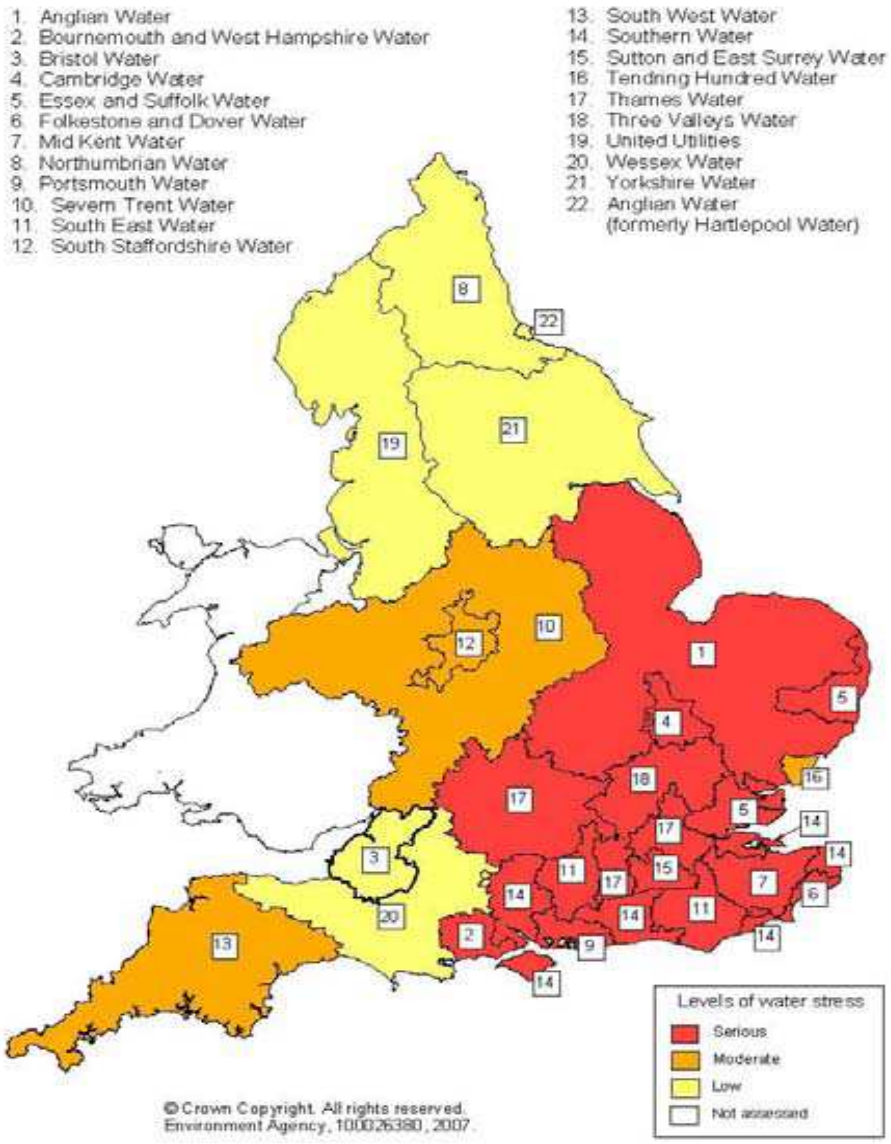
Wastewater Collection and Treatment

[5] Environment Agency (2009) Water Cycle Study Guidance, Environment Agency, Accessed on line, Date Accessed 04.02.11, Web site address: http://www.environment-agency.gov.uk/research/planning/33368.aspx

2.3 National and International Pressures

2.3.1 The careful management of water in a region of the country with low rainfall and a growing population is difficult. This is further exacerbated with predicated climate change and more extreme weather events intensifying summer drought or flooding in the winter period.

2.3.2 Figure 3.0 - Current Relative Water Scarcity



2.3.3 Figure 3 shows areas of relative water stress in England. It makes it clear that water stress is most significant in the East and South East of the country (NB Veolia Water SE, No 6, is denoted here under its previous name of Folkestone and Dover Water).

2.3.4 The significance of climate change to water related issues has been recognised internationally. The United Nations confirm: “There is mounting evidence in many regions of the impact of climate change on the earth’s hydrological cycle” and describes the process as “a basic driver changing water availability and use”[6]. In intensified or accelerated natural systems, risks of shorter term shocks such as flood events are increased alongside long-term trends of such as diminished availability. The significance of water assets is recognised in international initiatives including European regulation of water quality (Water Framework Directive).

2.4 Physical factors affecting Hydrology

2.4.1 As previously described the hydrological cycle is affected by various physical factors, such as topography and soil type. Topography is particularly important as it forms river catchment areas or basins, which collect water and ultimately direct it to the sea.

2.4.2 The district’s LDF must consider the approach to development on the basis of Shepway’s own characteristics. In terms of its environment, the district is in many areas defined by its waterbodies and associated landscapes such as marshland. Moreover, human action has often centred around physical water features, from locating villages by springs through to the significance of the Cinque Ports, the construction the Royal Military Canal and the growth of towns as holiday resorts. In terms of the location of residents, modern Shepway is largely a coastal district.

2.4.3 In Shepway there are two river basins; the Rother to the west and the Stour in the east. The amount of available water in each basin - which are much larger than the district of Shepway - has a direct impact on the environmental characteristics of the area. These form major defining features in water management terms, along with the sea:

- **Rother Catchment:** In the context of Shepway this catchment covers Dungeness and Romney Marsh. The Romney Marsh is formed from a large expanse of low lying flat land. Its primary use is for agriculture, either arable or grazing; much of this agricultural land is traversed by a network of drainage channels. The unique shingle headland at Dungeness is of international importance for wildlife. The volume and quality of water on the Marsh is vital for both the agriculture industry and wildlife.

- **Stour Catchment:** The Stour Catchment covers the northern section of the District above Folkestone. Falling within the Kent Downs Area of Outstanding Natural Beauty, it is generally rural in nature with several

[6] Unesco (2009) The United Nations World Water Assessment Programme *The Implications of Climate Change on Water: Highlights on climate change from the UN World Water Development Report 3: Water in a Changing World,* Unesco, Accessed on line, Date Accessed 31.01.11, Web site address: http://unesdoc.unesco.org/images/0018/001863/186317e.pdf

historic settlements, including Elham, Lyminge and Hawkinge. This area has large tracts of important woodland and agricultural countryside.

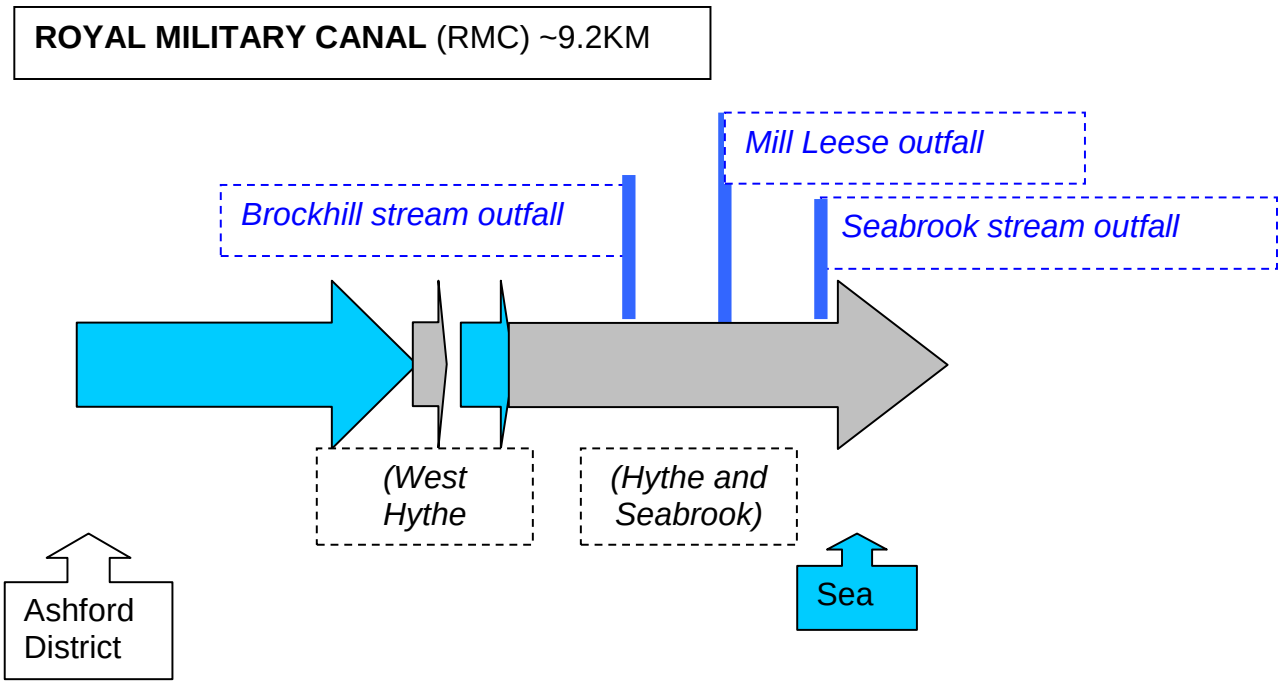
2.4.4 In addition, the coastline is a strategic feature of Shepway and the sea has a major influence on the environment, economy and society of the district. Many of Shepway's significant settlements are located along the coast and have strong links with the sea. Shepway's coastal (and inland) water bodies offer opportunities for sport and recreation, another important reason why the quality and quantity of water is important.

2.5 Water's prominence in defining Shepway's context

2.5.1 To evaluate the current relationship between Shepway's water features and planning policy, the coast and main watercourses have been examined on a linear basis. This means breaking down lengths of shoreline or streams according to their designation on the Shepway Local Plan (2006) proposals map. The key results (sections by land use designation) are shown in Appendices 2 and 3, drawn to an approximate scale allowing a comparison of the relative proposed significance of land uses in coastal or watercourse environments.

2.5.2 This linear, map-focused analysis, has also been applied to main inland watercourses, producing the diagrams in Appendix 2. This has been undertaken for main streams and canals as defined by standard maps (such as named Ordnance Survey) features. The example below of the Royal Military Canal (RMC) within Shepway shows, to approximate scale, the flow of the Canal (from Ashford's administrative area) through open countryside and settlements to the sea.

2.5.3 Figure 4.0 - A linear summary of the RMC in Shepway



2.5.4 This illustration reveals that although the RMC in Shepway initially flows through open countryside (blue coloured) it is actually mostly in or next to an urban environment in most of its length, (within or on the defined settlement boundaries of West Hythe and Hythe town, in the Local Plan 2006 proposals map) shown grey. Looking left to right, it is also shown that after its countryside stretches, three other identified streams flow into the RMC and this happens near the sea in Hythe and Seabrook.

2.5.5 Figure 4 does not show any of the features that are associated with the Royal Military Canal, such as the Martello Towers, which make it so significant in the context of the district. It is important in many ways, forming landscape character, providing for recreation and valuable habitat as well as acting as an important drainage channel.

2.5.6 The analysis (see Appendix 2) clearly reveals the contrast between the 'sewers' of the Marsh and the rivers/streams elsewhere in Shepway. *Jury's Gut/White Kemp* and *New Sewers* each flow for 24 and 16km (15 and 10 miles) through Shepway, are avoid all the towns, although the New Sewer cuts through the southern fringes of St Mary's Bay.

2.5.7 In contrast, the *Nailbourne* is next longest watercourse in Shepway after the RMC and Marsh Sewers, but is only about 8km (5 miles) in length. This is slightly longer than the *East Stour*. Both these watercourses are in the north of the district and are largely rural, although they flow in different directions (north and east respectively). The only other streams of any significant length are the *Pent (West)* and *Seabrook Streams* (both around 4.5km).

2.5.8 The streams in the North Downs region of Shepway rise in the hills behind Folkestone and follow the topography down to the coast or out into neighbouring districts. Of these, the Pent Stream is notable in being almost completely urban in setting and rarely seen in its natural state, being widely culverted from the northwest edges of Folkestone through to Tontine Street, after which it flows in Folkestone Harbour. The only significantly evidence open section is from the northern part of Cheriton Road Sports Ground through to Lower Radnor Park.

2.5.9 This linear analysis has also been undertaken on the district's immediate coastline using the Local Plan's Proposals Map. Shepway has an extensive coastline so results are presented in two parts: the eastern urban stretch, and the remainder. This focuses on the area along or immediate inland of the shoreline (not the sea itself) for the whole of the district. This break-down is illustrated for the 'urban coastline', that is the area of Folkestone and Hythe as defined by the proposals map settlement boundaries, in Appendix 1.

2.5.10 To the east of the urban area in Shepway is the Folkestone Warren which is a site of special scientific interest and popular recreational resource. The remainder of the district's coastline (south and west of Hythe) is around in 25km long (approx 15 miles) flanking the parishes of Dymchurch, St Mary in the Marsh, New Romney Town and Lydd (including Dungeness). This is made of dozens of separate sections, although coastal environments arguably take

a more cohesive form on the far southern stretches. Table 1 aggregates the results of the linear analysis of maps and policies for the area.

2.5.11 - Table 1 Evaluation of local planning policies for Shepway coastline (west of Hythe)

Coastline land designation	Further information	Approx. length (km)
Local landscape area (only designation)	Open land characteristic of Romney Marsh south of St Mary's Bay	0.2
Designated open space	Play areas and amenity greenspace at The Greens, Littlestone.	0.8
Designated settlements (villages)	Including some conservation designations (Dymchurch and Littlestone Conservation Areas)	2.8
Undesignated land	Includes a shoreline frontage of approximately 1km by Dungeness Power Station.	5
Natural environment conservation designations	Includes: • heritage/undeveloped coast, • nature conservation, biodiversity and scientific designations (supported by several international 'Natura 2000' habitats) • special landscape area. •	Residual (over 15km)

2.5.12 The table shows lengths in ascending significance (length). Although limited to the point immediately landward of the coast, and not considering specifically coastal structures such as sea defences, this evaluation suggests that the coastal environment outside of the main urban area is often of notable conservation value, and elsewhere may have limited specific planning policy other than provisions for being generally non-built up. As well as the specific features of the Dungeness area, the human value of coastal areas in the district for residential and recreational purposes is apparent in certain locations. Issues facing this environment are considered further in section 6.6.

2.5.13 A linear study of both inland watercourses and the coast reveal particular water features of the urban area (Folkestone and Hythe). The coastal analysis is illustrated in Appendix 1. This reveals:

- The two most extensive planning policy approaches at present in the urban coastline are leisure designations such as open space, or no specific designation.
- The next most extensive designations are for various built environment 'conservation' or 'regeneration' purposes. These both cover over a mile of Folkestone and Hythe's coastline (around 1.5km or more) each. Most of these designations can be attributed to specific urban environments: the attractive community of Sandgate, and the large development site of Folkestone Seafront (respectively).

2.5.14 Identification of urban or open countryside character is a key element of the examination of watercourses (see Appendix 1). The main urban streams and the canal are shown in Table 2:

2.5.15 - Table 2 Most urban watercourses by evaluation of planning policies

Coastline land designation	Relevant settlement(s)	Approximate length	
		Total 'urban' setting (Km)	Proportion 'urban' of whole length (%)
Royal Military Canal (RMC)	Hythe and Seabrook, West Hythe village	6.3	~60
Pent Stream (west)	Folkestone	4.4	~99
Nailbourne	Lyminge, Elham	1	~15

2.5.16 By total length, the RMC has the longest urban stretch of Shepway watercourses, but the Pent has a generally much more urban feel on its journey to sea. Shepway covers only a relatively small part of the whole length of the RMC; a rural western stretch and its riparian environment in the defined Hythe area is often characterised by a generous amount of open space on one or both sides.

2.5.17 The two other identified watercourses shown in Appendix 1, *Brockhill* and *Mill Leese streams* flow into the RMC after their short journey south through countryside and the main urban area. These streams form important elements of the built environment, but they are potentially more prominent during periods of heavy rainfall. This is pertinent as the topography, descending from the escarpment through the towns, translates into significant stream discharge and great 'flash flood' risk. There may be appropriate opportunities for 'de-culverting' that could reduce flood risk and produce both environmental and social benefits.

2.5.18 Figure 5.0 - Shepway's Surface Water Bodies

Not to Scale

This depicts just how complex the surface water network within the district is. The myriad of drainage channels that are found on Romney Marsh correlate with its flat topography and the proximity of the water table to the surface of the land. Significant water courses that are mentioned within the text are numbered individually.

2.5.19 **In summary,** a section by section examination of the linear setting and applicable planning policies for water in Shepway confirms the following:

- The dominance of the coast as a prominent water feature defining much of the district.
- Shepway's coast is flanked by a variety of land-uses. Across the district's coastline, whether urban or rural, leisure is commonly a prominent land use.
- Along the district's coast, nature conservation is clearly a vital issue for a range of scientific and human interest reasons.
- The built environment along the coast has identified positive planning attributes in certain areas (that may directly stem from a coastal location). This can take the form of existing high quality townscapes, or in contrast, the potential of (previously developed) land to provide popular new development.
- A small amount of Shepway's coastline is not formally designated in relation to any specific purpose or objective. It is protected from development outside of urban areas but there is not at present an integrated 'a coastline policy'.
- The Royal Military Canal is highly significant, not least in the context of its route through the Hythe area.

- The Pent Stream is not long, especially in terms of being evident at ground level, but flows through the heart of Folkestone. It is perhaps the most significant example of the streams that run southwards off the North Downs through the main urban area bringing issues such as flood risk.
- The longest and least urbanised watercourses in Shepway are generally in the Romney Marsh area. Elsewhere, the Nailbourne and East Stour are also prominent from this perspective. With agriculture as the dominant land use, changes in farming practices may be pertinent in influencing these watercourses, particularly regarding water quality.

2.5.20 These features confirm the merit in considering the local water cycle further, and highlight key areas of consideration in the report to maximise benefit to spatial planning.

Chapter 3 SPATIAL PLANNING CONTEXT

3.1 Introduction

3.1.1 This chapter draws together planning policy relating to water and water related issues. It looks at current policy (national and local) and then the nature of future provisions in the context of other forms of public intervention.

3.2 Current Planning Policy

3.2.1 - Table 3 National Planning Policy – Planning Policy Statements

Planning Policy Statement	Policy Content
Planning Policy Statement 1 - Delivering Sustainable Development and the Supplement to Planning Policy Statement 1- Planning and Climate Change	Central government policy has an emphasis on the need to promote sustainable development and construction in the context of climate change [7]
Planning Policy Statement 3 - Housing	Ensures that people have the opportunity to live in a decent, affordable home in a community in which they want to live.[8]
Planning Policy Statement 12 - Creating Strong, Safe and Prosperous Communities through Local Spatial Planning	Explains what local spatial planning is and how it benefits communities. It also sets out what the key ingredients of local spatial plans are and the key government policies on how they should be prepared. Vital to policy is the evidence that supports spatial plans; see S4.8. [9]
Planning Policy Statement 23 - Planning and Pollution Control	Recognises the role that the planning system can play in determining suitable locations for development in relation to pollutants. [10]
Planning Policy Statement 25 - Development and Flood Risk	Requires local planning authorities to evaluate how susceptible land is to flooding so that they can apply a risk based approach to preparation of their development plans in relation to flooding. Acknowledges flood risk in association with development and directs development away from high risk areas. [11]

[7] ODPM (2005) Planning Policy Statement 1: Delivering Sustainable Development, HMSO, Accessed on line, Date Accessed 25.03.10, Web site address: http://www.communities.gov.uk/publications/planningandbuilding/planningpolicystatement1

[8] DCLG (2006) Planning Policy Statement 3: Housing, HMSO, Accessed on line, Date accessed 25.03.10, Web site address: http://www.communities.gov.uk/publications/planningandbuilding/pps3housing

[9] DCLG (2008) Planning Policy Statement 12: creating strong safe and prosperous communities through Local Spatial Planning, HMSO, Accessed on line, Date accessed 25.03.10, Web site address: http://www.communities.gov.uk/documents/planningandbuilding/doc/pps12.doc

[10] ODPM (2004) Planning Policy Statement 23: Planning and Pollution Control, HMSO, Accessed on line, Date accessed 24.05.10, Web site address: http://www.communities.gov.uk/publications/planningandbuilding/planningpolicystatement23

[11] DCLG (2006) Planning Policy Statement 25: Development and Flood Risk, HMSO, Accessed on line, Date accessed 24.05.10, Web site address: http://www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk

3.2.2 Current Local Planning Policy

The Shepway District Local Plan Review was adopted 16th March 2006. Whilst it is to be replaced by new policies under the LDF many policies within it will remain active after that time (including after the Core Strategy element of the LDF is adopted). The policies/sections of policies that are shown below are those that are considered most relevant to water.

3.2.3 - Table 4 Local Plan Policy

Local Plan Policy	Policy Content
Policy SD 1	Promotes sustainable development, whilst meeting economic and social objectives and respecting recognised environmental criteria
Policy U1a	Development which increases the demand for off site service infrastructure will not be permitted unless sufficient capacity exists or extra capacity will be provided in time to serve the development.
Policy U4	Protects the potential yield of surface or groundwater resources and against the pollution of groundwater sources
Policy U9	In association with the Environment Agency ensures that adequate measures are provided for the proper use and conservation of water resources in relation to development
Policy CO1	Promotes the protection of the countryside in accordance with a number of recognised criteria
Policy CO4	Special Landscape Areas include; North Downs (including the scarp and crest), Old Romney Shoreline and Dungeness. Policy protects these from development unless there are significant economic or social considerations
Policy CO5	Local Landscape Areas include; Romney Marsh, Sandgate Escarpment and Seabrook Valley, Eaton Lands, Coolinge Lane and Enbrook Valley and Mill Lease. Policy protects, promotes the enhancement of the landscape character and functioning of these areas unless significant economic or social objectives have sufficient weight.
Policy CO6	Protects the Folkestone and Dover Heritage Coast and areas of undeveloped coast. Within these areas development will not be permitted unless proposals preserve and enhance natural beauty, landscape, heritage, scientific and nature conservation value (consistent with any agreed management plan). It must be demonstrated that a coastal location is required for development and that no suitable site exists along the developed coast. Proposals should where practicable also maintain or improve public access to the coast where this can be achieved without compromising conservation objectives.
Policy CO8	Planning permission for development which would significantly affect the integrity of internationally designated or potential sites will be refused unless it is necessary for the suitable management of the site or if there are no alternatives.
Policy CO9	Development in or near Sites of Special Scientific Interest or the Dungeness National Nature Reserves, which would adversely affect their wildlife or scientific interest would not be permitted unless there is an exceptional need for it which overrides the national or regional value of the designation and there are measures to minimise impacts and fully compensate for remaining adverse effects.
Policy CO10	Development in or near Wildlife Sites or (proposed) Local Nature Reserves where such development would be detrimental to the nature conservation and / or scientific interest would not be permitted unless there is exceptional need for it and there are measures to minimise impacts and fully compensate for remaining adverse effects.

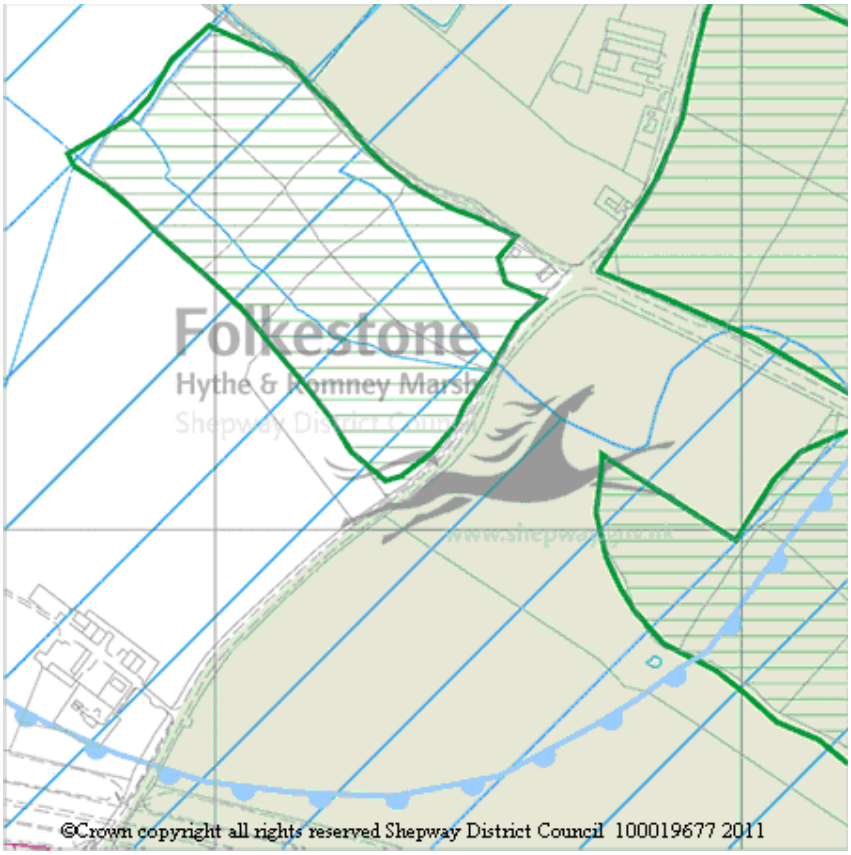
Policy CO11	Permission will be refused for development if it is likely to endanger plant or animal life (or its habitat) protected under law and/or identified as a UK Biodiversity Action Plan priority species or cause the loss of, or damage to, habitats and landscape features of importance for nature conservation, unless there is a significant need for it and there are measures to minimise impacts and fully compensate for remaining adverse affects.
Policy CO12	Promotes the use of planning conditions/obligations from development to protect and enhance nature conservation resources
Policy CO13	Development proposals likely to have a harmful effect on the freshwater environment will only be permitted where harmful impact will be minimal, and where there are recognised benefits. In such cases, measures should be taken to minimise impacts and fully compensate for remaining adverse effects.
Policy CO14	Promotes long term protection to Dungeness by giving priority to considerations related to its international importance for physiography, flora and fauna over other planning considerations.[12]

3.2.4 Local plan policy recognises the importance of protecting water through sustainable development in appropriate locations with sufficient infrastructure. It also protects those areas of the district that are of significance in terms of biodiversity or landscape.

3.2.5 The following figure is an extract from the Proposals Map Shepway District Local Plan Review 2006, taken from an area just to the east of Junction 11 of the M20. The blue hatched areas designate the areas covered by Policy U4/Groundwater Source Protection Zones.

[12]Shepway DC (2006) Shepway District Local Plan Review, SDC, Accessed on line, Date accessed: 26.03.10, Web site address: http://www.shepway.gov.uk/webapp/local-plan/contents_written.php

3.2.6 Figure 6.0 - Extract from Proposals Map Shepway District Local Plan Review 2006



Key

Shading	Policy	Description
Blue diagonal Hatch	U4	Groundwater source protection zone
Solid green	CO3	Kent Downs Area of Outstanding Natural Beauty
Dark green horizontal hatch	CO10	Site of Nature Conservation Interest
Light blue line punctuated	U7	Water course catchment at particular risk from increased surface water runoff

3.3 New National Policy

3.3.1 The consultation draft for Planning for a Low Carbon Future in a Changing Climate will replace the Planning and Climate Change supplement to PPS 1 and PPS 22 on Renewable Energy. It is anticipated that this will become a consolidated supplement to PPS 1. This new supplement will provide a framework for PPS 25: *Development and Flood Risk* and the new work that is emerging on Green Infrastructure.

3.3.2 This new policy is a response to the amount of new legislation that that has emerged in recent years that relate to the mitigation of climate change and the promotion of more sustainable development. This new PPS will set out how planning can facilitate new development to support economic and social objectives whilst promoting lower carbon emissions and providing greater resilience to climate change[13].

[13] DCLG (2010) Consultation on a Planning Policy Statement: Planning for a Low Carbon Future in a Changing Climate, DCGL, Accessed on Line, Date accessed: 20.09.10, Web site address http://www.communities.gov.uk/publications/planningandbuilding/ppsclimateconsultation

3.4 The South East Plan

3.4.1 Adopted in 2009 - although unlikely to maintain its formal status - this still contains some useful criteria to safeguarding the quantity and quality of water in the environment.

3.4.2 The content and nature of this former policy can be divided into three broad categories:

- Cross cutting issues, that relate that sustainability and the protection of resources and safeguarding the environment
- Housing policy that reinforces the need to provide adequate infrastructure and good quality sustainable design.
- Natural Resource Management, which promotes the sustainable use of water and consideration of flood risk, biodiversity and coastal management

3.4.3 The South East Plan policies can be viewed in Appendix 3, which are relevant although the future status of Regional Spatial Strategies is uncertain.

3.5 Key Water-Related Issues Identified In Existing Policy

3.5.1 This sub-section directly relates national and local policy to the key environmental challenges that exist within the south east, the following table, Table 5, identifies key policies that relate to water supply and its protection. Central to this is the concept of natural resource management.

3.5.2 - Table 5 Planning policies that relate to water

Key Issue	Challenge	Approach adopted in existing policy	Core National Policy	Current Local Policy
WATER RESOURCES	Maintaining an adequate supply and encouraging water efficiency in the context of a regulated water-supply industry	Protect aquifers and surface waters from over-abstraction and pollution Increase efficiency of use Develop sustainable new sources of supply	PPS1 PPS3	SD1 U1a U4 U9
WATER QUALITY	Maintaining and improving quality, meeting EU Directive standards and objectives	Avoidance and management of household, business and agricultural effluent discharge into receiving waters and systems Improvements to existing and provision of new wastewater infrastructure	PPS1 PPS3 PPS23	U4 U9
FLOODING	Increased risk of flooding to development in flood plains, changing patterns of rainfall, extreme weather, storms, rising sea levels and agricultural run off	Avoid an increase in flood risk through appropriate location and design of new development in line with PPS25 sequential test and strategic flood risk assessments Protect existing flood defences Incorporate sustainable urban drainage and flood storage measures into new development.	PPS25	Follow national policy informed by the SFRA.
COAST	Maintaining coastline as an environmental, economic and recreational resource,	Ensure sensitive amounts and types of development Reinforce links with Shoreline Management Plans, Estuary Management Plans and Coastal	PPS1 PPS25	CO6 CO10 CO11 CO14

	responding to climate change pressures and rising sea levels Avoiding instability, erosion and flooding	Habitat Management Plans		
BIODIVERSITY	Protecting and improving the diversity of habitats and species across the South East, particularly sites and species of national and international importance, to contribute to quality of the environment and quality of life	Avoid or mitigate development pressure on sites Maintain and expand important wildlife assets Better management of habitats Establish, connect and maintain green infrastructure	PPS1	CO1 CO4 CO5 CO8 CO9 CO10 CO11
SUSTAINABLE DESIGN AND CONSTRUC-TION	Reducing resource use in construction and lowering environmental impacts of new development	Sensitive and forward thinking design in new development Encourage high standards under the Code for Sustainable Homes Encourage local and renewable materials	PPS1 PPS3	CO12

These grouped themes identify key challenges for future policy to address for the sustainable management of water-related issues. Future policy formation and this report

3.5.3 As the local planning authority (LPA), Shepway is responsible for balancing the economic, environmental and social needs of the district. It is the primary organisation with the ability to direct growth within the district, mitigating impacts and encouraging opportunities. Development is plan-led in this country, which means the LDF is pivotal to dealing with sustainable development and future water management issues.

3.5.4 The LDF is forward looking, planning to meet future needs in this local setting. To be fully effective, this will be based on the concept of 'spatial planning', not just related to land use and construction, but also seeking to align with other corporate objectives. In terms of Shepway District Council this means recognising the activities undertaken other than acting as the LPA, for example contributing to shoreline management (including engineering), emergency planning and local contingencies, and supporting environmental stewardship (such as local biodiversity initiatives). Moreover, proper spatial planning requires coordination with the plans and projects of other bodies and service providers such as the EA.

3.5.5 In order to examine this in more detail and draw together current plans that set parameters for LDF policy, the next section (main body of the report) covers the key issues relating to water supply, waste water treatment and flooding.

SECTION B – EVALUATION

Section B is more practical in its content rather than theoretical. It discusses the role of the Water Framework Directive as a tool to protect and improve the quantity and quality of natural water bodies, it then evaluates the status of these in Shepway before investigating the implications of this in terms of water resources, waste water treatment and new development. This section concludes with a synopsis of flood related issues in relation to the Core Strategy Preferred Options and Shepway.

Most sections are structured to examine main current issues, then moving on to aspects of future aspects of management, where specific recommendations are shown in underlined text. Summaries are included at the end of chapters to help provide an overview of the sets of issues and challenges.

Chapter 4 WATER FRAMEWORK DIRECTIVE

4.1Introduction

4.1.1 The Water Framework Directive (more formally the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) is a European Union directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies, including surface waters, groundwater and marine waters out to one nautical mile from the shore.

4.1.2 The Directive requires the production of a number of key documents over six year planning cycles. Most important among these are River Basin Management Plans. The first of these was published in 2009; two further plans will be published in 2015 and 2021. These are a means of achieving the protection, improvement and sustainable use of the water environment.

4.1.3 Under the Water Framework Directive waters are classified as either good, moderate, poor or bad. The Directive sets a target of aiming to achieve at least 'good status' in all waters by 2015 or 2027 at the latest. For surface waters there are two separate classifications for water bodies; ecological and chemical. For a surface water body to be in overall 'good' status both ecological and chemical status must be at least 'good'. Ecological status is recorded on a scale high, good, moderate, poor and bad; chemical status is recorded as good or fail. For groundwater, there are also two separate classifications; quantitative and chemical. For a groundwater water body to be in overall 'good' status, both quantitative and chemical status must be 'good'. Groundwater status is recorded as good or poor. The Directive requires member states to aim to achieve at least good status in each water body within their river basin districts.

4.1.4 Plans must include the objectives for each water body, reasons for not achieving objectives where relevant and the programme of actions required to meet the objectives. The Environment Agency has the responsibility to produce River Basin Management Plans in this country. The plan for the south east includes a suit of documents; of note is Annex C: Actions to deliver objectives and Annexe J: Aligning other key processes to river basin management. This is of particular relevance to the council as it promotes the coordination of different strands of policy from different bodies to underpin sustainable growth objectives.[14]

[14] Environment Agency (Date Unknown) South East Basin Management Plan, Environment Agency, Accessed on line, Date Accessed: December 2010, Web site address: http://www.environment-agency.gov.uk/research/planning/124978.aspx

4.1.5 There are a range of threats to the quantity and quality of water in the environment:

- point source pollution from sewage treatment works
- the physical modification of water bodies
- diffuse pollution from agricultural activities
- diffuse pollution from urban sources
- water abstraction
- transport pressures
- Recreation
- Saline intrusion

4.1.6 With the exception of pollution arising from agricultural activities, any new development associated with Shepway's growth proposals could pose a direct or indirect threat to water quantity or quality for any of the above reasons. However, of particular interest in terms of this document are point source pollution from sewage treatment works, water abstraction and issues relating to saline intrusion, relevant because of the sensitivity of the European designated wildlife sites in Dungeness.

4.1.7 As such, and in association with the objectives of the Water Framework Directive this report will concentrate on:

- The volume of water that can be extracted from natural water bodies
- The quality of treated water that can be deposited back into natural water bodies
- The importance of water and the sustainable management of this resource in relation to the district's ecology

4.1.8 In addition this report will acknowledge issues relating to maritime flooding because of the geographical location and typology of the district.

4.1.9 This document identifies some of the key 'pathways' connecting development and the water cycle through analysing the impact of potential development on the service providers, who ultimately rely on the hydrological cycle.

4.1.10 In this chapter the current status of surface and groundwater bodies and bathing water will be discussed. The impact of development on water supply and waste water treatment is discussed in Chapter 5 and flooding issues are discussed in Chapter 6.

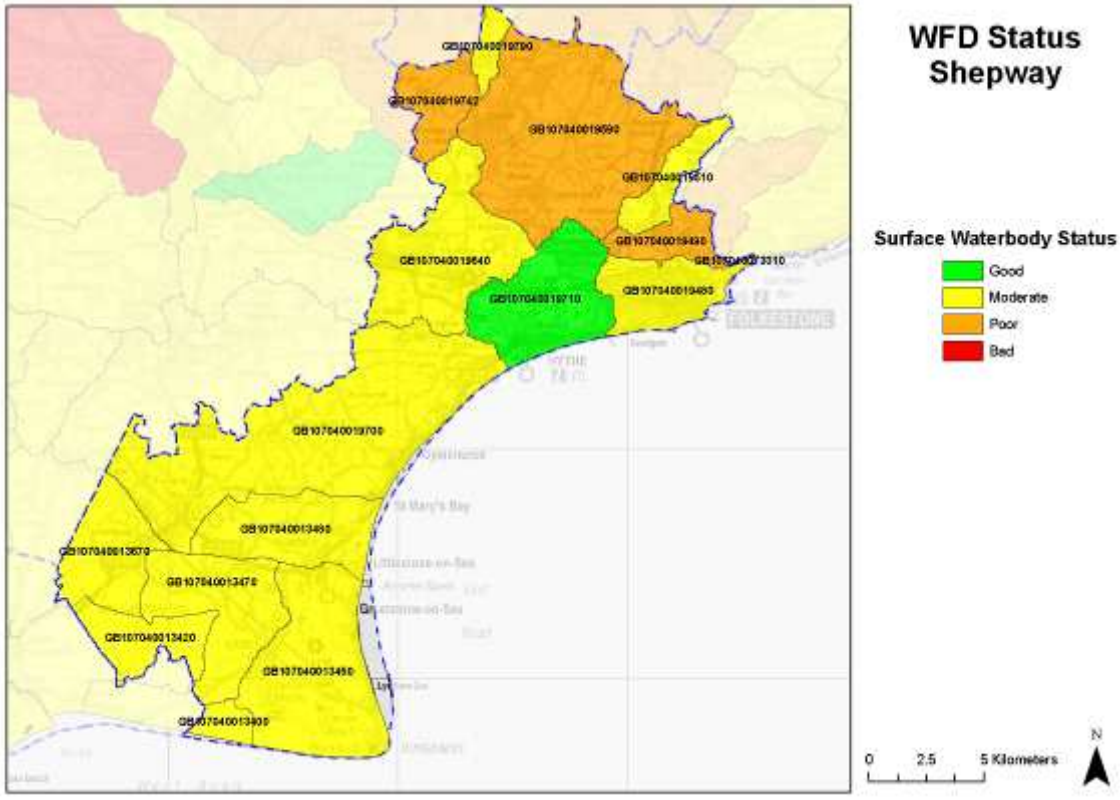
4.2 Current Issues Surface Waters

A selection of typical images of the Romney Marsh

4.2.1 Whilst surface waters are important in contributing to all natural and urban landscapes, they are particularly intrinsic to the character of Romney Marsh, which is divided up by a network of water courses, the most notable of which is the Royal Military Canal.

4.2.2 Most of the surface water bodies in Shepway are accredited with a moderate status; whilst there are some areas to the north of the district that are classified as poor, there are no bad areas (the lowest category). The objective is to achieve a good status, of which there is one example in Shepway - the Seabrook Stream and the eastern end of the Royal Military Canal. This is illustrated below in Figure 7.

4.2.3 Figure 7.0 - Water Framework Directive Status in Shepway



Not to Scale

4.3 Future Management of Surface Waters

4.3.1 In summary the environmental objectives for surface waters in accordance with the Water Framework Directive are:

- Prevent deterioration in status for water bodies
- Aim to achieve good ecological and good surface water chemical status in water bodies by 2015
- For water bodies that are designated as artificial or heavily modified, aim to achieve good ecological potential by 2015 (Achieving a good status for heavily modified water bodies may be problematic, as there may be overriding reasons for the physical state of the water body that cannot be overcome, such as flood risk management needs or maintenance for good drainage. In such situations, as long as the ecology and water quality are good, the physical conditions may be left unaltered, resulting with the water body achieving a status of good ecological potential)
- Comply with objectives and standards for protected areas (those covered by the Freshwater Fish Directive, the Habitats Directive or within SSSI's etc.) where relevant.
- Reduce pollution from priority substances and cease discharges, emissions and losses of priority hazardous substances.

4.3.2 Section 2.5 of this report outlines water's prominence within the district. This report considers that much typical planned development - either through characteristics of its location or type (or both) - may present only tangential LDF opportunities to tackle these specific issues. Nevertheless, this report makes recommendations to highlight practical avenues to tackle this important issue in Shepway.

4.3.3 Relating the WFD to the LDF, it is clearly vital - as a precursor to improvements - to prevent overall deterioration in the quality of surface waterbodies, maintain water quality and water levels to maintain effective functioning of ecosystems and where possible to enhance environmental conditions. This seems a reasonable expectation and spatial planning can contribute, for example, through close scrutiny of potentially polluting proposals (to the extent within the remit of planning legislation).

4.3.4 This basic recommendation must be complemented, given the ambitious timescales, by a recommendation for the LDF to aim to support measures prioritising improved ecological and surface water chemical status. Finally, given the geography of Shepway versus current status, it is recommended this approach applies equally district-wide

4.4 Current Issues Groundwater

4.4.1 The purity and volume of groundwater is important for a number of reasons:

- the ecology of the district
- ensuring that drinking water conforms to Drinking Water Industry standards
- the protection of rivers and surface water features dependent on groundwater.

Nailbourne Stream at Elham

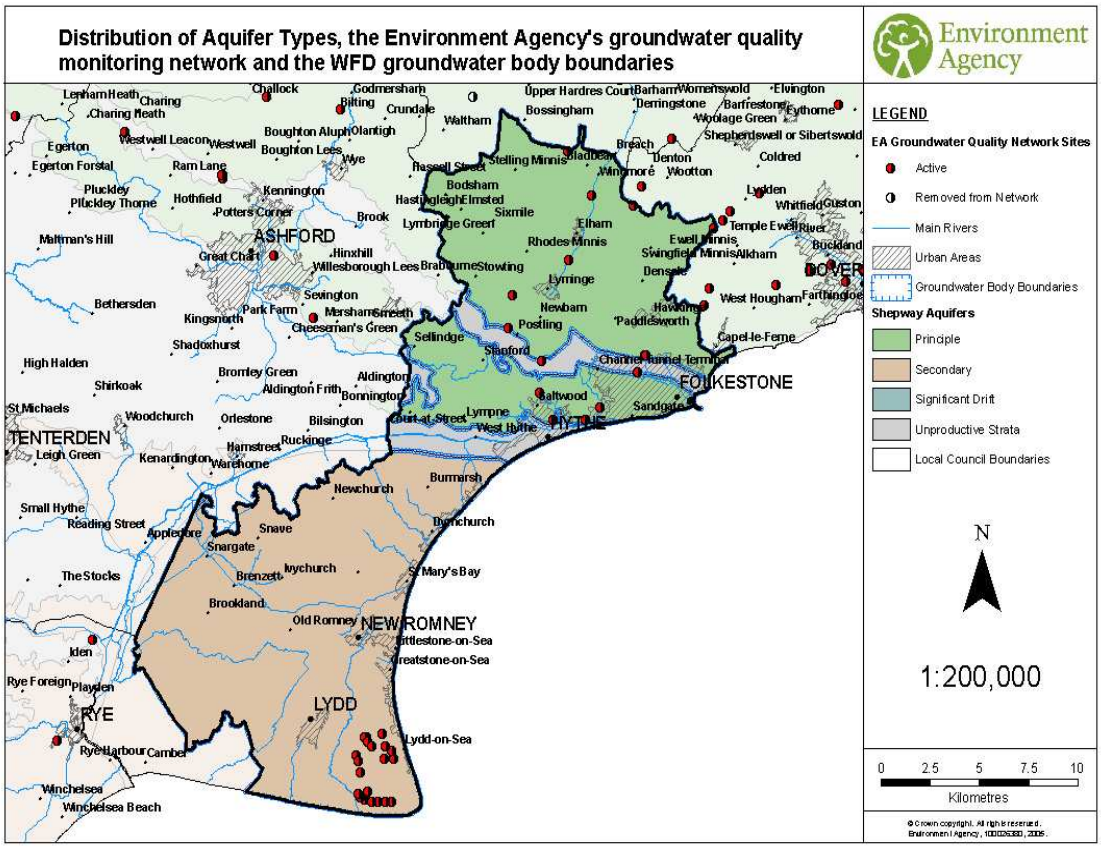
4.4.2 Groundwater is vital to life and livelihoods. In Shepway it provides approximately 70% of drinking water and supports many of the rivers and wetland habitats. Groundwater quality must be protected and improved. Abstraction of groundwater has to be balanced with the needs of the environment.

Nailbourne Stream at Lyminge

4.4.3 The aquifer sources in the north of the district are considered 'principle aquifers' under the Water Framework Directive (Chalk and Greensand). However, the groundwater sources in the south of the district (the Denge Gravel Aquifer in Dungeness) are also important although classified as 'secondary' they provide a significant source of water for the area. The distribution of aquifers throughout Shepway is shown in Figure 8.

4.4.4 There are concerns about the condition of aquifers that cover Shepway, both in terms of water quality and quantity and so it is important that new development does not place additional undue pressure on natural water reserves. Further information on the health on groundwater in and adjacent to the district can be found within the supporting information for the Water Framework Directive on the Environment Agency website, available via http://www.environment-agency.gov.uk/research/planning/124978.aspx

4.4.5 Figure 8.0 - Distribution of Aquifer Types



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Not to Scale

4.5 Future Management of Groundwater

4.5.1 In summary the environmental objectives for groundwater are:

- Prevent deterioration in the status of groundwater bodies
- Aim to achieve good quantitative and good groundwater chemical status by 2015 in all those bodies currently at poor status
- Implement actions to reverse any significant and sustained upward trends in pollutant concentrations in groundwater
- Comply with the objectives and standards for protected areas where relevant
- Prevent or limit the input of pollutants into groundwater.

4.5.2 Groundwater is a vital aspect of the hydrologic cycle and thus an important consideration for sustainable development. Unless nowhere were to develop, future arrangements to manage Shepway's groundwater will be vital, particularly for quantitative factors (limit over-abstraction). This report considers the potential effect new development may have on the hydrological cycle through the associated additional demand in water and the treatment of additional waste water. However, development may also present water related

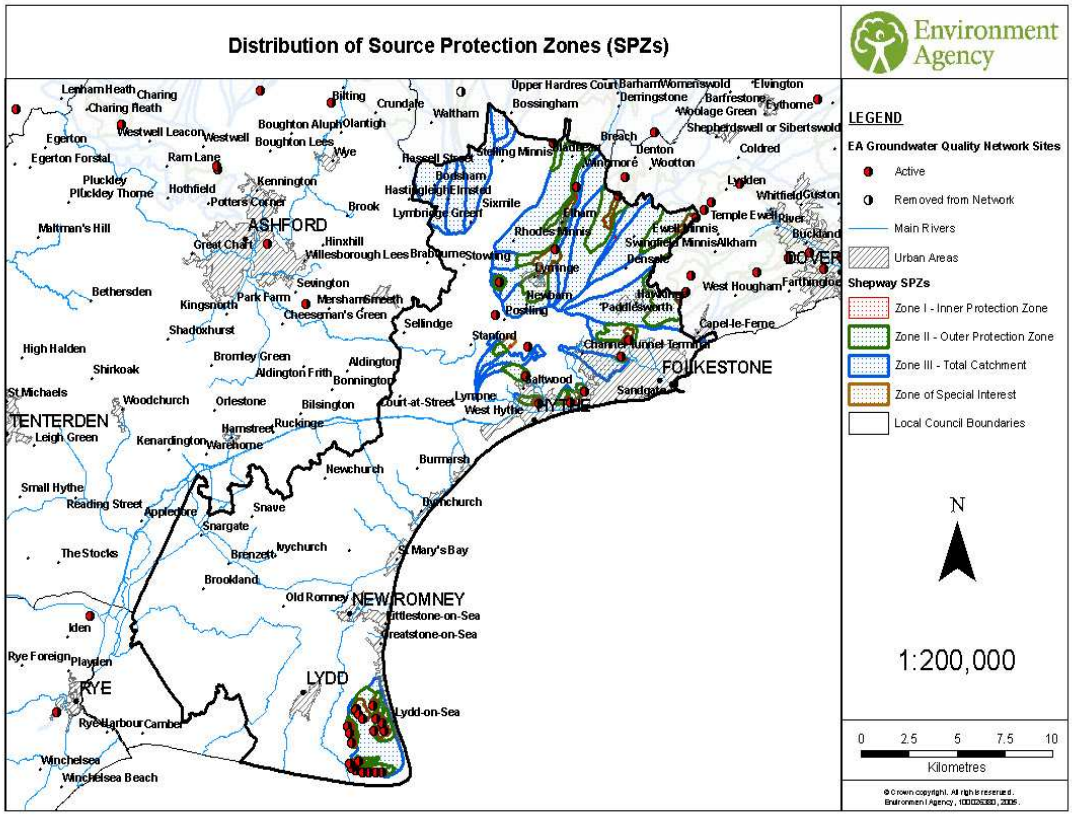
[15] Environment Agency (2009) Fact Sheet, State of Groundwater Report, Shepway District Council, Environment Agency

opportunities; e.g. through the mitigation of surface run-off, temporary storage of storm water or improvements to habitat. With this in mind the careful control of new development is vital to minimise the impact of new development and maximise any benefits.

4.5.3 The principal objective of WFD policy in relation to groundwater is to achieve good overall status in as many groundwater bodies as possible by 2027, although this is likely to be difficult because of the time it can take for pollutants to move from surface to groundwater and because of the risk of saline intrusion caused by rising sea levels. To achieve this it is necessary to prevent or limit sources of pollution of groundwater (see 4.1.5 for sources of pollution).

4.5.4 Shepway's current development plan already includes provisions to protect the quality of local groundwater in sensitive areas, and an overview of the primary areas is shown in Figure 9.

4.5.5 Figure 9.0 - Distribution of Source Protection Zones



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Not to Scale

4.5.6 The district's Groundwater Source Protection Zones is now a well-established policy, delivered through the local planning authority working closely with the Environment Agency and providing an effective and focused

[16] Environment Agency (2009) Fact Sheet, State of Groundwater Report, Shepway District Council, Environment Agency

protection mechanism. It is recommended this approach be maintained, and at the appropriate juncture in the LDF, potentially be reinforced or expanded depending on confirmation of need. In addition organisations will need to plan so that sufficient capacity exists in terms of waste water treatment to ensure that there is no impact on water quality from growth, and this is considered explicitly within Chapter 5 of this report, touching on issues such as infrastructure upgrades and development delivery arrangements.

4.5.7 The operation of these Zones will be assisted by changing arrangements for non-mains sewage (relevant to a large part of rural Shepway, but only a limited population):

- Historically, waste was dealt with in these areas through septic tanks but this is problematic as waste is only partially 'broken down' before being emitted. Due to the threat of contamination septic tanks are not allowed in an inner Source Protection Zone, and in certain other conditions. The alternative of a cesspool (cesspit) does not face this particular restriction as it should only store sewage. However, the requirements for installation and regular emptying by suction tanker means a cesspool is rarely practical even on small developments.
- The sustainable option (especially for larger developments) is a non-polluting individual treatment plant, with appropriate discharge.
- Under the government's regulatory reform, procedures for any such discharge are going to be covered under the new Environmental Permitting Programme Second Phase. Under this regime, exemptions are possible for new systems (equivalent to serving up to 27 people for larger treatment plants, or 11 people for small plant or septic tank)[17].

The Shepway LDF should seek (at the appropriate stage) to support the approach of expecting any development to try and connect to a mains sewer.

4.5.8 Agricultural chemicals and urban run off are also major contributing factors to poor groundwater result. The Water Framework Directive provides the mechanism by which to address these problems, at present by 2027. This highlights the need to focus on pathways of impact between development (such as urban run-off) and the water cycle to identify achievable actions. To this end, Sustainable Urban Drainage Systems (SuDS) are considered in Chapter 5.

4.5.9 The degree of imperative for these recommendations depends on the environment and local water feature attributes, and if prioritisation of further water quality protection is required, it may be prudent to focus spatially, for example on the North Downs area.

4.5.10 In terms of the district's growth as a whole, reserves of water need to be sufficiently aligned with the management of increasing demand sources, whilst continuing to ensure the quality of groundwater is also protected. It is recommended here that these issues are tackled collectively, although

[17] As calculated by the wastewater systems company LTE: http://www.wte-ltd.co.uk/epp2.html.

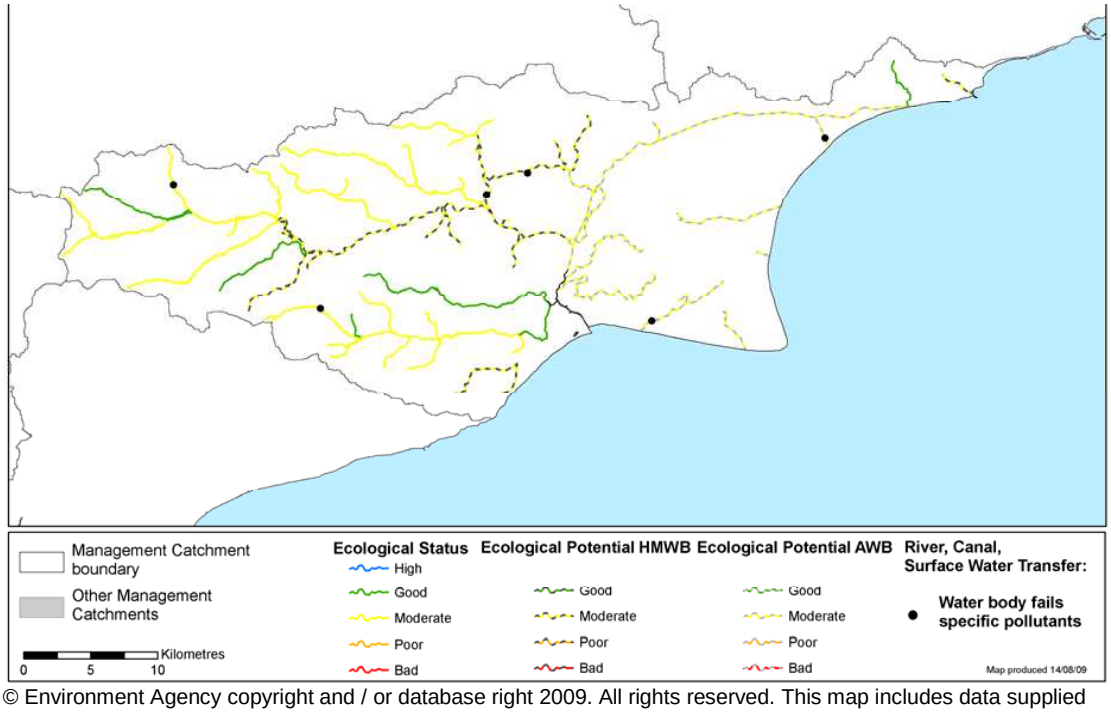
specific LDF proposals in relation to water resources are made later in the report.

4.6 Current Issues Rother Catchment

A selection of typical images of Romney Marsh

4.6.1 Surface and groundwater are abstracted from the Rother catchment from the Denge gravels, Walland Marsh and Romney Marsh. The chalk and sand geology of this area means there is a strong connection between groundwater and surface water. The Rother catchment area encompasses some important habitats including the Dungeness to Pett level SPA and Dungeness SAC, both of which it supports.[18.]

4.6.2 Figure 10.0 - Current ecological status/potential of river water bodies in the Rother catchment



[18] Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, Scott Wilson & SDC, Accessed on line, Date Accessed 04.02.11, Web site address:
http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

4.6.3 Point source pollution from sewage works is a major challenge in the catchment. This is currently limiting the number of rivers at good status. A high proportion of rivers and lakes in the catchment are heavily modified or artificial. The activities in these waters can hinder the movement of fish and increase the challenge for providing good ecology.

4.7 Future Management of the Rother Catchment

4.7.1This catchment's groundwater bodies suffer from high nitrate concentrations arising from urban sources; such as leaking sewer pipes and disturbance to soil during development and agriculture. There are also concerns regarding the amount of water that can be abstracted from the Rother Catchment without harming the ecology of the area.

4.7.2 The EA is currently reviewing the licence for the Denge Gravels, which is likely to lead to decrease in the volume of water that is currently permissible. This process should be complete with the next few years. However Veolia Water South East is aware of this issue and currently abstracts water below the levels permissible within the current licence.

4.7.3 The council is aware of the delicate ecology of the area, in particular those ecological sites recognised at a European level. It is aware of their susceptibility to increased salinity as a result of climate change (coastal management issues are discussed in Chapter 6, Section 3) and will work with partners to protect the environmental quality of the district.

4.8 Current Issues Stour Catchment

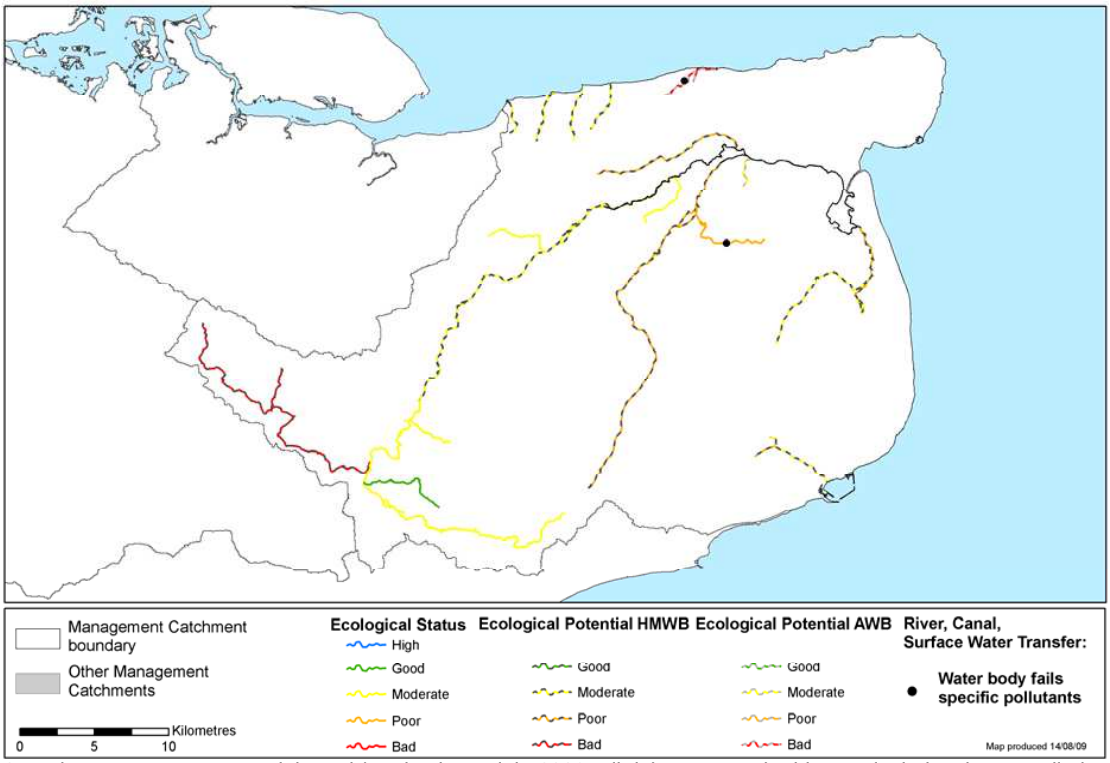
4.8.1 Many significant water bodies in this catchment are outside the district boundary as it encompasses a wide area including the Thanet Coast and Sandwich Bay SAC, SPA and Ramsar site, Stodmarsh SAC and Ramsar.[19] However, it is important to consider that the hydrological cycle does not respect political boundaries and as such it is important to recognise that activities within the district can adversely affect our neighbours. In terms of groundwater the Stour Catchment is important as it contains the principal aquifers that supply the district with water.

4.8.2 Point source pollution from sewage works and diffuse pollution from agriculture is an issue that has had an impact on water quality in the Stour area.[20]

[19]Environment Agency (2003) The Stour Catchment Abstraction Management Strategy, Environment Agency, Accessed on line, Date Accessed 07.02.11, Web site address: http://www.environment-agency.gov.uk/cy/ymchwil/cynllunio/33448.aspx

[20]Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, Scott Wilson & SDC, Accessed on line, Date Accessed 04.02.11, Web site address: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

4.8.3 Figure 11.0 - Current ecological status/potential of river water bodies in the Stour catchment



4.9 Future Management of the Stour Catchment

4.9.1 Like the Rother, the quality of water systems within the Stour catchment could also be improved. Section 2.5 shows these watercourses are sometimes shaped by the built environment in the district's towns and villages. Shepway lies at the edge of the Stour catchment, which means that any polluting activity will affect the quality of water downstream outside of the district.

4.9.2 Over abstraction at the edge of a river catchment may also have significant implications for the volume of water within surface water bodies further downstream. As such the management of abstraction and protection of water in the Shepway area of the Stour catchment is particularly important to safeguard ground and surface waters beyond the boundaries of the district.

4.10 Current Issues Coastal Waters

4.10.1 In accordance with the Water Framework Directive the coastline is divided in coastal water bodies, which extend about a mile off shore. There are two bodies that cover the Shepway coastline, Kent South and Sussex East, both of these coastal water bodies are classified as heavily modified with moderate ecological potential. This is due to the construction of flood defences. Where appropriate mitigation measures may enable these coastal water bodies to be reclassified to those with 'good ecological potential'.

Beach at Hythe

4.10.2 This is important to Shepway and the local summer economy as the district's beaches attract large numbers of visitors. The quality of the district's bathing waters is monitored by the EA and the results from bathing water quality tests are published in the council's Annual Monitoring Report. In 2009 120 separate tests were taken in the district at six different locations; Folkestone, Sandgate, Hythe, Dymchurch, St Mary's Bay and Littlestone.

4.10.3 Guidelines under the EU Bathing Water Directive stipulate that where possible:

- No more than 500 Total Coliforms per 100ml of water in at least 80% of samples (16 or more of the 20)
- No more than 100 Faecal Coliforms per 100ml of water in at least 80% of samples (16 or more of the 20)
- No more than 100 Faecal Streptococci per 100ml of water in at least 90% of samples (18 or more of the 20)

These guidelines are stricter than the equivalent EU mandatory levels. Table 6 shows the results of the 2009 tests,

4.10.4 - Table 6 Bathing Water Test Results

Test site	Number of samples failed	Percentage of samples failed	EA classification
Folkestone	4/20	20%	Good
Sandgate	4/20	20%	Excellent
Hythe	1/20	5%	Excellent
Dymchurch	3/20	15%	Excellent
St Mary's Bay	2/20	10%	Excellent
Littlestone	6/20	30%	Good

4.10.5 The 2009 AMR reported that in 2008, 18.3% of samples failed to meet guideline standards which in 2009 decreased to 16.6%. Fluctuations in figures are not abnormal and can be affected by weather, for example, as additional rainwater usually causes higher levels of Coliforms and Streptococci. These samples can also be affected by tidal flows.[21]

[21]Shepway District Council (2010) Annual Monitoring Report, Shepway District Council, Accessed on line, Date accessed 03.02.11, Web site asddress http://www.shepway.gov.uk/UserFiles/File/pdf/local-plan/annual-monitoring-report/Shepway%20AMR%202010.pdf

4.11 Future Management Coastal and Bathing Waters

4.11.1Marine waters are a useful resource for the district and the council and its partners will seek to maintain the generally excellent bathing water quality. This report recognises the impact that urban runoff may have on the quality of coastal waters and will seek to ensure that this is minimised through the planning process and, where possible the council will support measures to improve the status of the two heavily modified coastal water bodies.

4.12 Chapter Summary

4.12.1 Examining the concept of a water cycle in the local setting is intrinsic to delivering Water Framework Directive aims. In the protection of water within natural systems the WFD looks to provide a regulatory framework in which water can only be abstracted from the environment without having a major adverse impact on ecological systems. In Shepway, hydrology is regulated within the Rother and Stour River Basins. The status of surface waters and groundwater within the river basins has been shown to be varied and the council recognises the need to protect and where possible enhance the quality and to protect our limited water reserves.

4.12.2 Shepway's coastal waters are also important to district. These are ultimately the 'sink' for urban runoff transferring them to the sea. Whilst the volume of marine water available to dilute pollutants is significant, the council acknowledges the importance of protecting its coastal waters.

4.12.3 The contents of this chapter have outlined the current condition of water within the local environment. This necessitates the need to understand the impact that new development may have on the district, so that adverse impacts can be minimised. This is studied in the next chapter.

4.12.4 The commitment to protecting groundwater quality must continue and be reinforced by better designed development. In the future the attention of all agencies will have to focus on delivering active improvements to quality. Shepway's dependence on groundwater for a range of activities means concerns about quantitative water issues are legitimate, and must be reconciled in development strategy. Specific LDF recommendations for consideration have been indentified in text above (underlined).

4.12.5 The integrated approach of this report and the WFD highlights that pressures on the water cycle are more acute in some locations than others. This is irrespective of the specifics of planned new development, but does highlight the growing importance of a holistic examination of natural resources, such as the hydrological balance at Dungeness in the context of precious habitats, or the prospect of saline intrusion in many coastal areas in the context of sea-level rises.

CHAPTER 5 WATER RESOURCES & WASTE WATER TREATMENT

5.1 Introduction

5.1.1 In the context of integrated research into the district's hydrology water supply is perhaps the single most pressing concern in the eyes of many people. Waste water treatment is critical to human wellbeing and the natural environment, but can be planned for over time (notwithstanding budgetary constraints and other practical issues). This process is made easier with the certainty of adopted policy and the knowledge of where housing growth will be directed, and hence it is still critical this report influences the LDF's approach. Water supply contrasts somewhat, arguably being less an issue of engineering and delivering an infrastructure solution. It is more directly sensitive to aggregate levels of development (especially residential) as there is ultimately a finite amount of drinking water available to supply new development.

5.2 Current Issues Water Resources

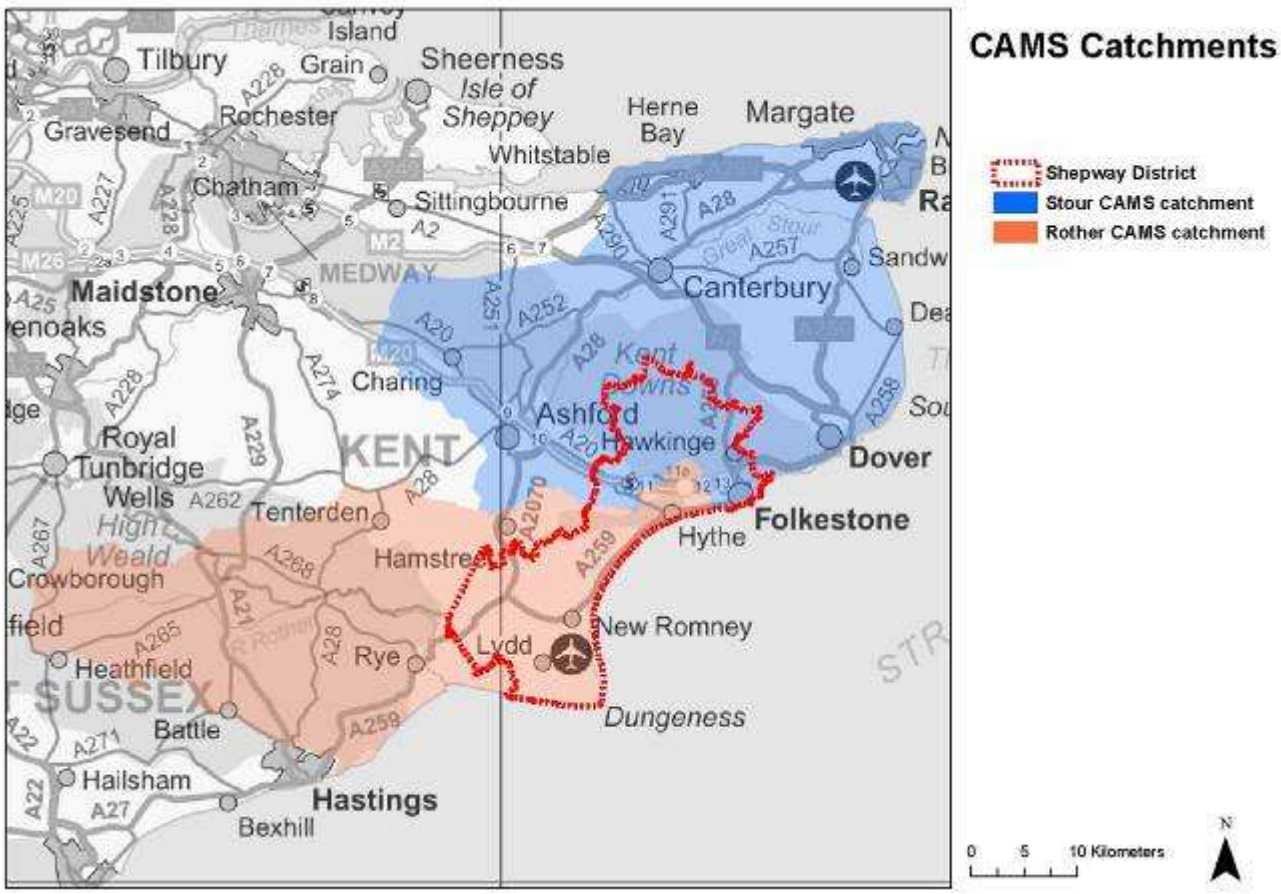
5.2.1 The South East has experienced low rainfall in recent years, including dry winters. Expected climate change trends for the south east are for drier summers, wetter winters, and more extreme events. Shepway, with its important wetland habitats, is particularly susceptible to such changes. The council recognises this and will endeavour to work with its partners to make strenuous efforts to reduce the risk of water stress, especially in European wetland sites (these are also represented in Table 12, 6.6.14)[22]

5.2.2 It is important that the amount of water that can be safely abstracted from natural systems is understood. Under the Water Framework Directive Catchment Abstraction Management Strategies (CAMS) are strategies for managing water resources at a local level and are predominantly about the amount of water available in a catchment area, although they do acknowledge water quality issues. The role of the CAMS is to define a flow regime that a sustainable ecology would require and then examine how the amount of water abstracted under licence would impact on this.

5.2.3 CAMS areas are defined by river basins. Shepway is covered by two river basins; those for the Stour and the Rother, and therefore is covered by two CAMS, as shown in Figure 12.

[22]Scott Wilson Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, Scott Wilson & SDC, Accessed on line, Date Accessed 04.02.11, Web site address: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

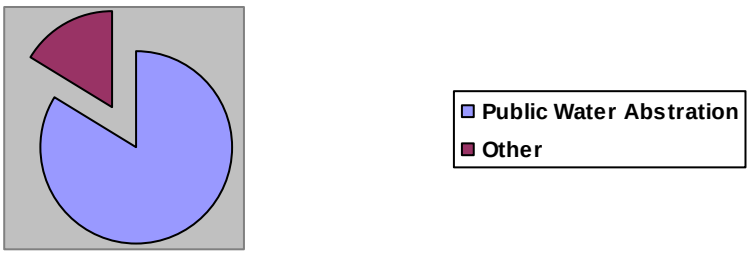
5.2.4 Figure 12.0 - CAMS Catchments that cover Shepway



23

5.2.5 There are 378 licensed abstractions in the Stour CAMS area. 286 of all licences are for spray irrigation, although this is a high proportion of all licences, this accounts for only 10% of the annual licensed quantity. Public water supply is the main abstractor, as it is licensed to take 84% of the total annual licensed quantity for the Stour CAMS area.

5.2.6 Figure 13.0 - Breakdown of Abstraction quantities in the Stour CAMS

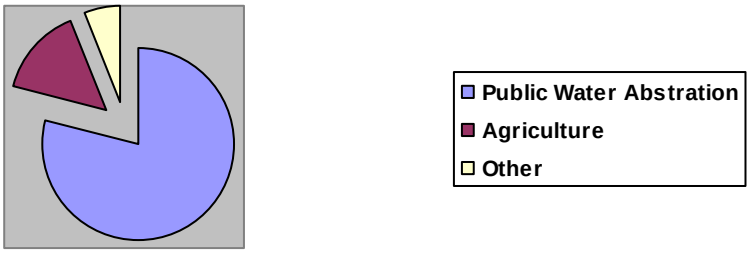


5.2.7 The majority of licensed abstraction within the Rother catchment is also for public water supply (78%). This is followed by industrial (15%) and

[23] Environment Agency (2010) CAMS Catchments (unpublished)

agricultural (6%) purposes. Approximately 60% of water abstracted in the catchment is drawn from groundwater sources with the remaining 40% from surface water.

5.2.8 Figure 14.0 - Breakdown of Abstraction quantities in the Rother CAMS



5.2.9 The EA has the responsibility for measuring the volume of surface and groundwater within a river catchment. This is done by measuring the quantity of naturally available water in a given water body and then comparing it against the quantity taken from it for public water supply, agriculture and industry.

5.2.10 Research by the EA shows that many of the surface and groundwater sources providing water for Shepway are 'over licensed' or 'over abstracted' (see Figure 8, 4.3.4 for locations of aquifers). Over abstraction means that the existing abstraction rates are causing water flows to drop below those required to sustain the ecology of the area. Importantly, the south of the Romney Marsh area is over-abstracted. Over licensed means that at existing rates of abstraction the volume of water in a system is only just sufficient to sustain the ecology of the area. In such a situation, if the rate of abstraction were to increase to the maximum limit permissible under the licence, flows would fall below that level.

5.2.11 Further information on the condition of the Stour and Rother catchments can be gained from EA publications – see footnotes.[24] [25]

5.3 Future Management of Water Supply

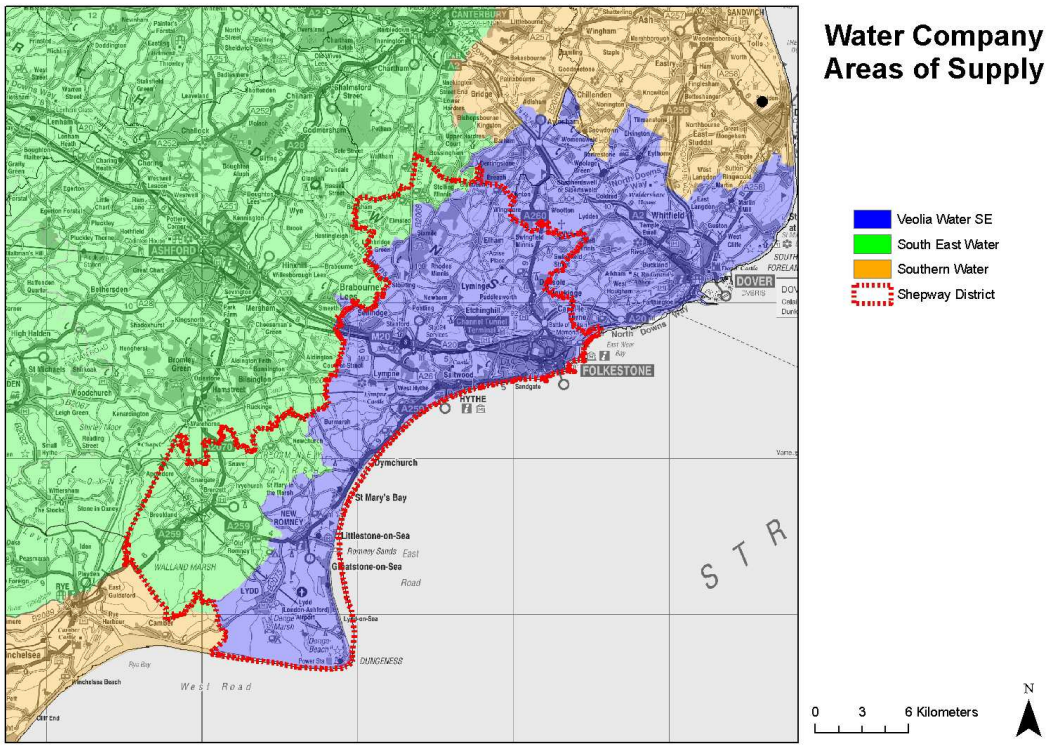
5.3.1 Drinking water in Shepway is supplied by two companies, Veolia Water SE (formerly Folkestone and Dover Water Services) and South East Water; however, the area of the district that is supplied by South East Water is minimal in terms of customer numbers. All of the major settlements in Shepway, as well as proposed strategic growth sites within the LDF Core Strategy Preferred Options document, fall under the jurisdiction of Veolia Water SE, and so this report is based around their policies and available water resources. Through this report and its liaison with the EA and Veolia

[24]Environment Agency (2003) The Stour Catchment Abstraction Management Strategy, Environment Agency, Accessed on line, Date Accessed 07.02.11, Web site address: http://www.environment-agency.gov.uk/cy/ymchwil/cynllunio/33448.aspx

[25]Environment Agency (Date unknown) Extract from Summary of Water Availability, Rother Cams, Environment Agency

Water SE the council has developed an understanding of the impact of emerging growth targets on the hydrology and water supply infrastructure of the district.

5.3.2 Figure 15.0 - Water Company Areas of Supply



Not to Scale

5.3.3 Veolia Water SE manages its water supplies as a single Water Resource Zone (WRZ). It means that water can potentially be supplied to many of the major settlements in both the Dover and Shepway districts from many different sources. This offers greater flexibility and security in water supply, facilitating the protection of individual sources in the event that they are threatened and it also means that the extra demands arising from growth could potentially be met by abstracting more water from natural sources outside of the district.

5.3.4 Water companies in the south east have to operate within the constraints of limited water supplies (described in the previous section) whilst having to ensure adequate provision for growing populations. In order to reconcile such conflicting requirements all water companies have a statutory duty as a water undertaker to prepare, consult, publish and maintain a water resources management plan (WRMP) under new sections of the Water Industry Act 1991, brought in by the Water Act of 2003.

5.3.5 Veolia Water SE has to balance a commitment to protecting the environment with its statutory duty to provide drinking water for Shepway. The company was granted water scarcity status in 2006, which allowed it to start a programme of introducing compulsory water efficiency measures. As no new

reserves are available within the company's operational area, the WRMP documents that coping with future demand is dependent on increasing the efficiency of water use and exploring the possibilities of new sources.

5.4 Examination of the Water Resources Management Plan

5.4.1 Veolia Water SE's WRMP was formerly adopted in October 2009, having been found to be sound by the EA and the Defra. It operates from 2010 to 2035 The WRMP explains how VWSE "will ensure a secure and sustainable supply of high quality water for customers over the next 25 years, taking into account the changes that are likely to occur in that period".[26]

5.4.2 During its preparation The Water Resources Management Plan was open to representation from stakeholders and interested parties. The EA, Ofwat (The Water Services Regulation Authority) and Kent Council Council all made significant contributions to the plan. Nevertheless, for the purposes of this report, the council has directly evaluated the WRMP and raised specific issues with Veolia Water SE. Naturally, to inform the LDF very close attention was paid to local growth assumptions utilised by the utility company, as outlined below.

5.4.3 Key issues that were raised during the exchange of comments and responses, which are of significance in terms of the confidence the council can have in the WRMP and subsequent delivery of its Core Strategy relate to:

- the reliability of water supply (through the discussion of deployable output, outage, shared resources, headroom and climate change)
- environmental issues (deployable output, climate change in relation to sustainable abstraction and strategic environmental assessment)
- water management (linked to metering, water efficiency measure, leakage management, population and household growth scenarios and associated consumption projections)

5.4.4 In ensuring these issues, which are key to sustainable water supply, were dealt with to the satisfaction of the EA, the council was able to conclude that the document provides a sound base upon which to work. Following the 'adoption' of the WRMP there were some further comments made by the EA, the council has raised the significance of these with the EA and is satisfied that they are not fundamental to the 'soundness' of the WRMP.

5.4.5 VWSE has adopted a twin track approach to water resource management. This links active management of demand and increasing water efficiency with investment in new water sources and improvements to infrastructure. In 2009 two new treatment works were completed by VWSE. It is anticipated they will provide access to additional water resources for the area.[27] This strategy will slow increases in water demand. VWSE proposes

[26] Veolia Water SE, (2009) Water Resources Management Plan 2009 Overview, pg 1, Veolia Water SE,

[27] Scott Wilson Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, Scott Wilson & SDC, Accessed on line, Date Accessed

that no infrastructure relating to the development of new water resources is required is seen as necessary within the life of the current WRMP, and accordingly LDF Core Strategy public infrastructure provisions may focus on other aspects of water cycle.

5.4.6 The WRMP assesses drinking water availability over the plan period using forecasts of demand in conjunction with the impact of water efficiency and leakage reduction measures. The demand forecasts are compared against predicted available water supply based on current resources and future known changes. This has to be done in the context of the predicted impacts from climate change. To allow for uncertainties the WRMP contains a reserve, known as headroom, which acts as a safeguard.

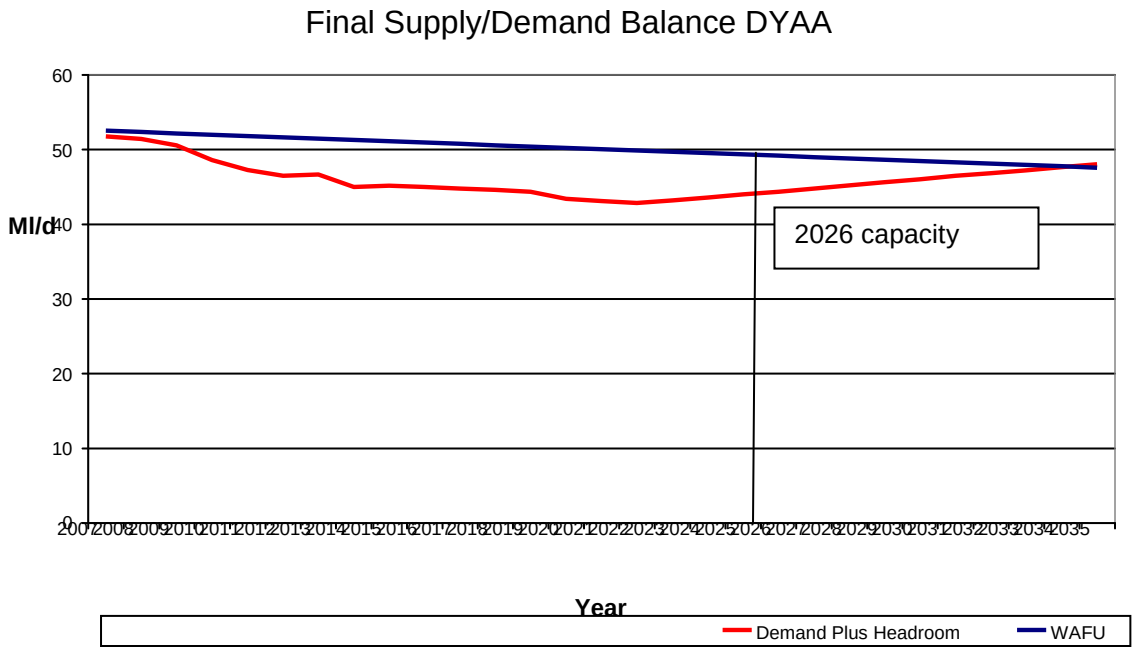
5.4.7 This report has tested the baseline assumptions[28] in terms of the actual water demand implications of new housing, e.g., population change across the WRMP area. See Appendix 4 for details. Summarising this, the WRMP is considered by Shepway District Council to use an appropriate projection scenario, baseline population and growth assumption. There are grounds to consider that whilst a reasonable projection, the rate of population growth overall may actually be relatively liberal.

5.4.8 Nevertheless, there is a rationale to directly consider the demand implications of housing supply options under consideration in the LDF. The WRMP was compiled using figures from the SE Plan, which provided for house building at a rate of 290 per annum in Shepway, up to and including 2026, with extrapolations of trend beyond that period. Various demand control measures will be implemented over the coming years, managing consumption and ensuring that there is a positive supply demand balance. This results in significant available capacity by 2026, which is projected to continue until the mid 2030s, as shown in Figure 16.

04.02.11, Web site address:
http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

[28] This is the core WRMP modelling (i.e. associated with a 290p.a. rate of house building) however the purposes this specific exercise is to focus on the determinants of demand – people and households – as the relationship between these demographic factors and planning strategy (new dwellings) is changing due to shifts in household composition.

5.4.9 Figure 16.0 - Water Supply Demand Balance using 290pa housing figures

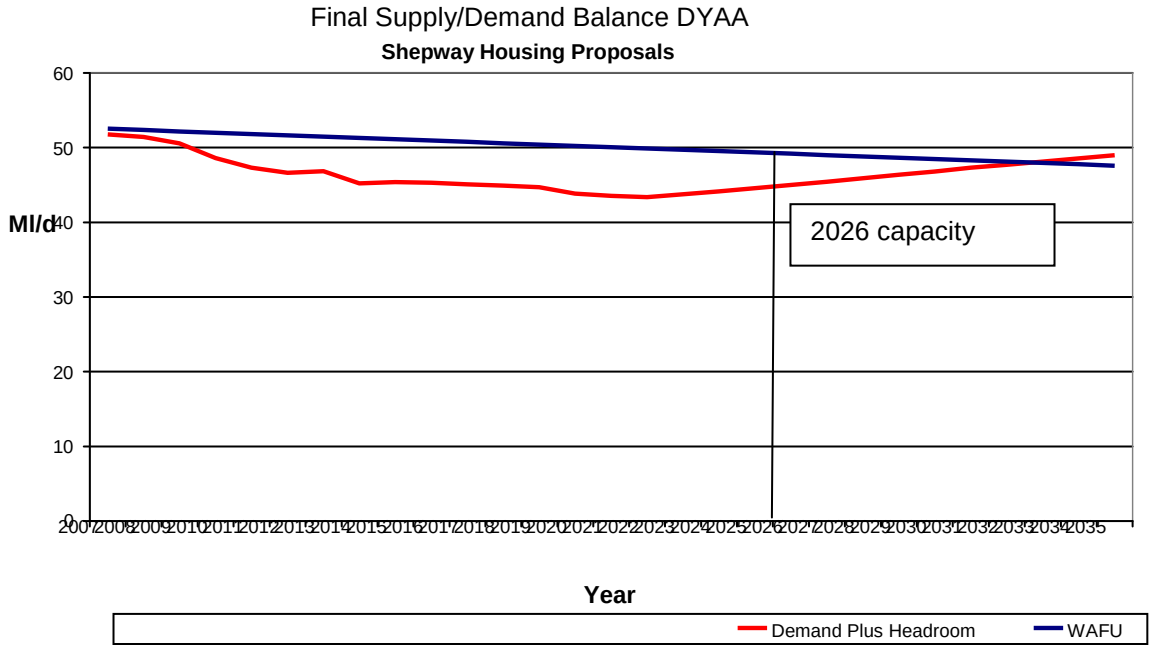


DYAA – Dry year annual average
WAFU – Water available for use

5.4.10 This essentially means that the bulk of any realistic future housing growth in the district has been allowed for in supply/water demand calculations and the water supply company, the regulator and official environmental watchdog are satisfied that there are sufficient water reserves available to the district to facilitate this growth in the WRMP period.

5.4.11 At the request of Shepway District Council, Veolia Water SE investigated LDF options by undertaking remodelling that adds a further 2,200 homes to 2026 (a higher rate under consideration in the LDF) and extrapolating this trend. This brings forward the need for a further resource or demand management schemes from the WRMP date of 2035 to 2033, as shown in Figure 17.

5.4.12 Figure 17.0 - Water Supply Demand Balance using 400pa Housing figures



DYAA – Dry year annual average
WAFU – Water available for use

5.4.13 An approximate estimate of the additional demand resulting from this LDF proposal is around 1 Ml/d by 2035. Given the supply demand situation shown above this should be well within the capacity of the strategic supply system in the Shepway plan period. The limited impact of additional housing may be attributable to two long-term factors: the fact that the increase as a proportion of change to the existing housing stock is insignificant (most houses will still not be new ones in any instance) and the fact that with reduced household size the population implications of new houses are reducing. Superimposed on these are increasing water efficiency measures.

5.4.14 The WRMP is based on the achievement of a level of domestic water usage for metered customers by 2015 that is equivalent to the water efficiency performance required in the Code for Sustainable Homes level 3* (and 4*). Accordingly, this report concludes that this level is a reasonable benchmark warranting planning policy support for new dwellings. Although there are sufficient water resources to accommodate a house building rate of 400 dwellings per annum to 2026, and potentially beyond. It is recommended here that new dwellings should be constructed to a minimum of Code 3* water efficiency levels. This should be supported through LDF policy measures (where viable) to complement sustainable water management.

5.4.15 It is clear, however, that the majority of housing within the district will be existing. The council will support the drinking water utility companies in their efforts to increase water efficiency in existing homes, notably the Water Efficiency Strategy contained with Veolia Water South East's Water Resources Management Plan. Veolia Water SE provides advice for its

customers on water efficiency. Customers throughout their area will be encouraged to reduce their use of water by metering, which is expected to reduce water demand by 10-15%. Veolia Water SE proposes to complete 96% of meter installations by April 2012. South East Water is also promoting water efficiency in the home through the installation of water meters and predict that this will reduce water usage by about 10%. The company anticipates that by 2020 90% of their customers will have a metered supply. South East Water is also very proactive in encouraging its customers to use less water.

5.4.16 This report does not independently examine the rate of usage per capita/household, but has scrutinised the other primary variable of domestic water demand: change in the population[29]. It is concluded that when set against recent locally available information, the WRMP has a robust base and may include an element of leeway above and beyond the formal calculation of headroom water supply.

5.4.17 However, with increasing climatic uncertainty, this planned approach does not mean that temporary water saving restrictions by Veolia Water SE (such as hosepipe bans) are completely avoidable during excessive periods of drought. The WRMP states (p. 20) that hosepipe bans are expected to be necessary only once every 7-11 years, on average. This means that in any individual year there is at least an 86% expectation of no ban. However the WRMP shows that day-to-day measures for smart water use are increasingly necessary given the long-term implications of water scarcity and finite resources.

5.4.18 This report finds that the examination of research undertaken during the formulation of the WRMP, and in discussion of alternative Shepway scenarios with the utility company, demonstrates an acceptable supply demand balance within the expected parameters of the LDF and WRMP (see Appendix 4). In the long-term period beyond the Core Strategy, the regular revisions of the WRMP can utilise the certainty of LDF provisions (when adopted) to ensure sufficient water management measures are delivered to guarantee future provision.

5.5 Summary of Water Resource Findings

5.5.1 Shepway is reliant on abstraction from groundwater sources for drinking water supply. The hydrology of the district relates to water availability within two river catchment areas; the Rother and the Stour. In terms of current domestic demand and future development within Shepway, the Stour is more significant. However, there other uses, such as agriculture, which is significant to the local economy, which need to be considered.

[29] Examination of plans and proposals in the area confirms that there are no major new industrial and agricultural uses that would increase total non-domestic demand. Indeed the Shepway Employment Land Review confirms that the prevalence of industrial uses is likely to gradually contract further to 2026, as other (presumably less water intensive) commercial uses grow instead.

5.5.2 The abstraction licence for the Denge Aquifer in the Rother river basin is currently being evaluated by the EA. Veolia Water SE anticipates that the volume of water that that is permissible to abstract will decrease once the review is complete, in order to protect the delicate ecology of the area. The company has taken this into consideration and currently abstracts less water than it is permitted to under the existing licence agreement. It is anticipated that a reduction in the volume of water that can be abstracted under the revised licences will not have a significant impact on the operation of the company.

5.5.3 Veolia Water SE's operational area includes all of the major settlements within the district and includes all the potential strategic sites that were detailed within the LDF Core Strategy Preferred Options consultation. Veolia Water SE's WRMP has been tested and found to be satisfactory, both in relation to Shepway's local knowledge and up-to-date projections of demographic changes, and the specific implications of a higher house building level than originally used in the WRMP.

5.6 Waste Water Treatment

5.6.1 The issue of waste water treatment is intrinsic to the protection of water quality. This part of the chapter looks at some of the most significant aspects of waste water treatment:

- The importance of water quality
- Sustainable Urban Drainage Systems and flooding issues from sewerage infrastructure
- Waste water treatment plants within Shepway and their operation

5.7 Current Wastewater Issues and the Importance of Water Quality

5.7.1 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients in the natural environment leading to unfavourable conditions. In addition, the EA has identified diffuse pollution, partly from urban run-off as a significant factor in creating unfavourable conditions.

5.7.2 Water quality is an important determinant in the quality of ecosystems and the species they support. Aquatic ones are obviously particularly reliant on it. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompany eutrophication deoxygenate water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so

eutrophication is associated with discharges containing available nitrogen.

- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

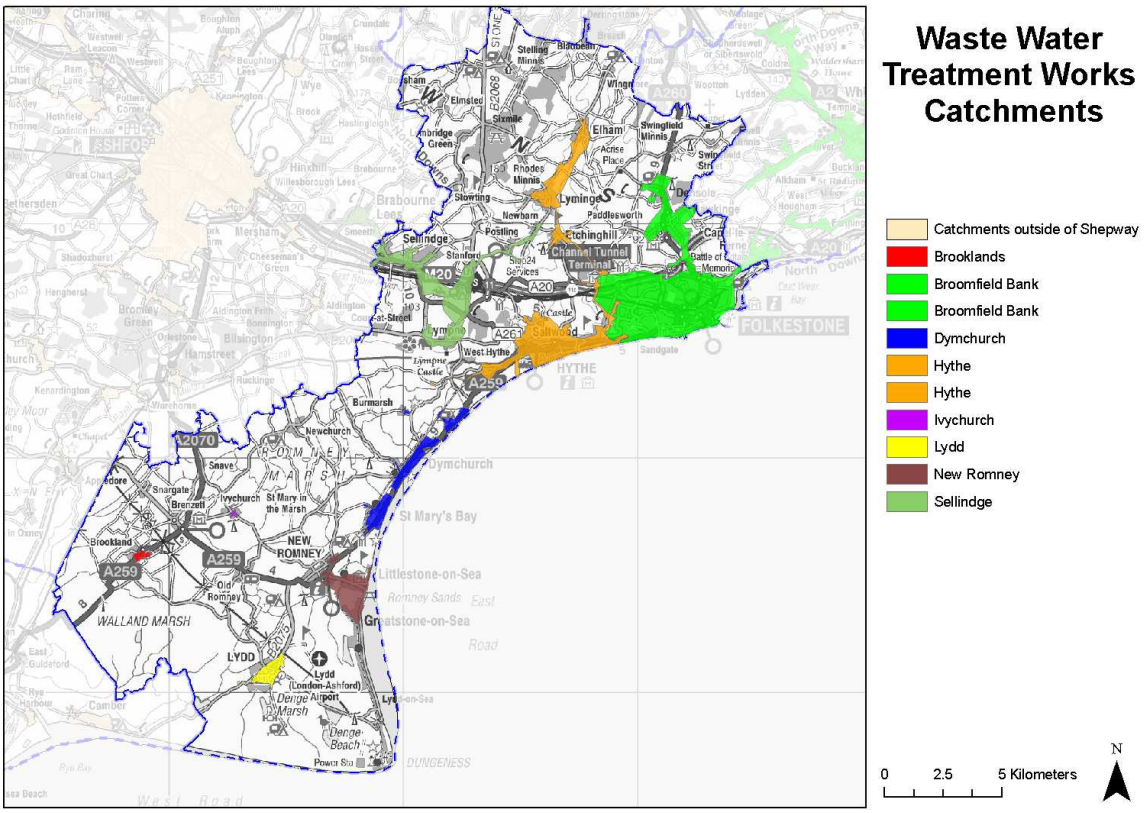
5.7.3 Waste water and sewage from homes and businesses in the district enter the sewage network managed by Southern Water. Waste water is treated and cleaned at a treatment works before being discharged to natural water bodies.

5.7.4 Precautions need to be taken that new development does not lead to increased levels of pollution and does not suffer from inappropriate odour nuisance when it located close to wastewater treatment works.

5.7.5 New development has a direct impact on waste water treatment infrastructure by using spare capacity in existing strategic sewers and waste water treatment works. The treatment of waste water is complex; especially relevant are the measures that are required to reduce chemical levels within treated waste water to those that are acceptable to discharge under the Water Framework Directive. Through consultation with Southern Water and the EA the council will need to ensure that its proposals for growth do not adversely affect water quality. The quality and quantity of water that is finally discharged to the environment is limited by licences issued by the EA so that the standards of the WFD can be met.

5.7.6 There are a number of waste water treatment plants that serve Shepway. The following diagram (Figure 18) names the treatment works and shows their catchment areas in the context of the district.

5.7.7 Figure 18.0 - Waste Water Treatment Works Catchments



Not to Scale

5.7.8 The above map shows the catchment areas for the waste water treatment works. It can be seen that they follow the coastline, as well as covering all the towns and all of the larger villages in the north of Shepway. This good coverage of settlements means nearly all future growth (housing development) will occur in localities already served by strategic wastewater infrastructure which means – apart from an identified connection issue in the Westenhanger area - the issue regarding waste water treatment is initially one of capacity or headroom at existing WWTWs. (Appendix 7 outlines the process the council is following to ensure that adequate infrastructure is provided for new developed proposed under the Core Strategy).

5.7.9 Figure 18 shows that much of the district falls outside the catchment areas for main waste water treatment plants. These areas are generally served by cesspits and septic tanks at present. The amount and density of new development in the areas not served by waste water treatment works tends to be low. For new development in these areas waste water treatment is managed through a set of regulatory regimes between the local authority and the EA. In many cases in these locations, new homes are provided with an individual facility, but where developments reach 12 dwellings or more, joint facilities may be instigated. In the work that the council has undertaken in compiling this report, no reliance has been made upon non-mains sewage treatment, as it is considered that this would be inappropriate. Table 7, 5.8.9 shows the current capacity of existing waste water treatment works and the impact that future growth in the district may have on these.

5.7.10 Local features of the wastewater management network often become readily apparent at times of stress to the system, such as heavy rainfall. Particularly in urban areas, impervious surfaces increase the amount of rainwater that drains into surface water sewers or sewers containing both surface and wastewater known as “combined sewers”. Flooding can result when the sewer is overwhelmed by heavy rainfall, becomes blocked or is of inadequate capacity, and will continue until the water drains away. When this happens to combined sewers, there is a high risk of land and property flooding with water contaminated with raw sewage as well as pollution of rivers due to discharge from combined sewer overflows. As this type of flooding is more often found in areas of higher residential density (a predominance of hard surfaces) this can impact on a significant number of households.

5.7.11 Many parts of Shepway are served by combined sewers and consequently there is an inherent risk that these could become surcharged during an extreme rainfall event. Many of the surface water and highway sewers also discharge directly into the watercourses that flow through these urban areas, which further exacerbates the problem. Detailed information on flood risk from this source is not available on a district-wide scale and therefore this type of flooding will need to be investigated on a site-specific scale[30].

5.8 Future Wastewater Management

5.8.1 The integrated concept behind this Water Cycle Report is particularly pertinent to wastewater management. To produce more sustainable systems, better design, planning and investment is needed throughout the built and natural environment. Strategic planning often focuses on larger public interventions, but these actions should be co-ordinated by privately-led green initiatives. There is now increased provision for the use of Sustainable Urban Drainage Systems (SuDS) under the Flood and Water Management Act 2010. This can mitigate the amount of water that is discharged into waste water treatment infrastructure (flood and contamination prevention) and also improve efficiency.

5.8.2 The 2010 Act contains a provision that construction work with drainage implications may not be commenced unless a drainage system for the works has been approved by a SuDS Approving Body[31]. The latter will generally be a county or unitary authority, i.e., Kent County Council. Approval will concentrate on the manner in which a drainage system is designed, constructed, maintained and operates. Critically, approval will be judged on whether a drainage system is constructed to comply with national standards for sustainable drainage.

[30]Herrington Consulting Limited (2009) Strategic Risk Assessment, Shepway District Council, (2nd Draft), Shepway District Council, Accessed on line, Date accessed 03.02.11, Web site address http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

[31] The Approving Body has a duty to consult with key stakeholders as and when appropriate; this will include such organisations as the EA and waste water utility companies. See Defra (2010) Flood and Water Management Act (Defra) Accessed On Line, date accessed 17.09.10, Web site address: www.defra.gov.uk/environment/flooding/policy/fwmb/key-docs.htm

5.8.3 However, it is recommended here that the LDF supports a positive approach to SuDs, both as a means to manage discharge and given the findings earlier in this chapter of a requirement to deliver increased water resource efficiency. Benefits gained from SuDS through the reduction of surface runoff and need for processing are recognised, although it should be remembered that the applicability of technical solutions varies. Well designed SuDS schemes can have significant benefits for the local communities that they serve, possibly forming part of a multifunctional green infrastructure network. This may also provide other benefits, e.g., mitigating the effects of climate change, ecological and recreational benefits or by improving the appearance of a housing scheme if carefully considered within the landscaping. Further recommended reading for best practice for SuDS schemes can be found at the end of this report.

5.8.4 Strategic planning is primarily concerned with the capacity of treatment of works, which is considered further below, and the main shared infrastructure that links together site-specific sewage connections with treatment works.

5.8.5 Given the identified issues, this report considers that landowners and the utility company (Southern Water) should - as a priority - work together to tackle the main identified strategic deficiency in wastewater connections. This is the link between the Westenhanger area and the Sellindge WWTW, and this report further recommends that the LDF reserves its prerogative to require direct developer funding or pooling to deliver the infrastructure, to specify phasing of development as appropriate, or (if necessary) to withhold support for strategic development in this location. Appendix 7 details the process by which the council engages with a developer and a utility company to ensure that sufficient infrastructure is provided for strategic sites. This does not negate the Development Management procedures for large developments (10 or more houses) which require comment from Southern Water on the capacity of existing strategic infrastructure; these comments form part of the criteria upon which a planning application is assessed.

5.8.6 The Flood and Water Management will affect developers by removing their automatic right to connect surface water to the public water network. The 2010 Act encourages the use of sustainable drainage systems and as such the connection of surface water to sewers will need to be approved by the Sustainable Approving Drainage Body (KCC). Developers will still retain the right to connect newly built foul sewers to the public network, but will have to enter into an adoption agreement with Southern Water.[32]

5.8.7 The sufficiency of current WWTWs is examined with reference to their capacity, planned investment and the 'worse impact' (maximum housing levels) scenario. The current capacity at these waste water treatment works is shown in Table 7, 5.8.9. This is calculated according to the Dry Weather Flow

[32] Defra (2010) Flood and Water Management Act (Defra) Accessed On Line, date accessed 17.09.10, Web site address:
http://www.defra.gov.uk/environment/flooding/documents/policy/fwmb/fwma-developersfactsheet.pdf

capacity at a waste water treatment works (the amount of water that Southern Water is licensed to discharge). This baseline information[33] is deducted from the existing capacity at waste water treatment works, which provides an estimate for the number of additional number of houses that each WWTW can legally serve. This is referred to as the headroom of a WWTW.

5.8.8 All of the WWTWs shown are located within Shepway with the exception of Broomfield Bank. The Periodic Review process is the mechanism through which investment programmes of the water companies is examined and authorised by Ofwat. The programmes are then funded by money gathered from customer payments, these programmes identify inadequacies in strategic infrastructure and target improvements that increase capacity.

5.8.9 - Table 7 Waste Water Works and Dry Weather Flows in Shepway

Waste Water Treatment Works	DWF Headroom households @500l/prop/d (Current nos of households that can be connected to system, and whether there are proposals for improving infrastructure/increasing capacity over the AMP period)	Relevant wards (or parish where cross boundary WWTW catchment)	Maximum Shepway housing growth for relevant wards (SHLAA totals34 + any greater quantum subsequently proposed by developer on strategic sites)	Some lack of headroom at WWTW in some periods if maximum housing growth occurs without phasing?	Water Cycle Report Summary
Brookland	100	Romney Marsh (all less Ivychurch parish)	31	NO	Capacity expected in all scenarios.
Dymchurch	800	Dymchurch & St Mary's	177	NO	Capacity expected in all scenarios.
West Hythe	Reconsenting has provided in excess of 2,200	Hythe West, Central and East, Tolsford, North Downs West (Lyminge Parish part), Elham & Stelling Minnis	1640	NO	Capacity expected in all scenarios

[33] The information provided is based upon an expectation of a household discharging 500 litres of waste water into the sewerage network each day, although increasing measures such as SUDS may better this scenario.

[34] All deliverable and developable sites in Strategic Housing Land Availability Assessment, other than those large Greenfield potential strategic sites explicitly not supported at LDF Core Strategy Preferred Options (sites outside of New Romney, Sellindge and Hawkinge). Sellindge total is 300 as this featured in the SHLAA and is greater than the expected amount emerging from the Rural Masterplanning Fund 'Sellindge Future' study.

Ivychurch	5 (small descriptive works)	Romney Marsh (Ivychurch parish)	0	NO	Capacity expected in all scenarios.
Lydd	New scheme has provided headroom of 400	Lydd	111	NO	depending on rate of delivery. Expected to be No capacity issue after 2012 under AMP5.
New Romney	2,600	New Romney Town, New Romney Coast	566	NO	Capacity expected in all scenarios.
Sellindge	1,250	North Downs West (less Lyminge Parish), Lympne & Stanford	C. 1100	NO**	Capacity maybe limited at the end of the period. Current figures based on latest expected strategic growth following cabinet Resolution 13th April 2011.
Broomfield Bank	14,000	All Folkestone wards, North Downs East	c. 5500	NO	Capacity expected in all scenarios, although may be limited at the end of the period, including higher level of development at Folkestone Seafront and with regard to development within Dover (where levels of growth could amount to 8228 by 2026*).

*Figures extracted from Dover District Council's Core Strategy and consultation with Dover Forward Planning Officers
**Long term headroom will require further investigation in association with growth outside the Shepway area.

5.8.10 For sewage treatment works close to capacity, further development may require investment in order to maintain water quality. This is not the general case in Shepway. Table 7, 5.8.9 tests a higher level of housing growth than is likely[35].

5.8.11 The indication from this initial broad study is that predicted growth within the district under the Core Strategy will not exceed the headroom

[35] In terms of LDF Core Strategy Preferred Options alternatives, the tested level approximates to SO2 (full utilisation of SHLAA deliverable and developable sites) even though Shepway was minded to support a lower level (SO3 preferred). The only higher level than this (SO1) was dismissed at Preferred Options as not developable.

(capacity) of the existing strategic sewerage network, with the exception of Sellindge and the possible exception of Lydd and Broomfield Bank (the latter is unlikely to be an issue until the end of the planning period in 2026). The council will strive to avoid undue pressure on existing facilities by ensuring that the necessary new infrastructure is provided to the satisfaction of Southern Water.

5.8.12 It is important that the AMP6 programme of improvements is fully planned and delivered in its entirety, and that the investment process continues with recognition of LDF progress:

- At West Hythe WWTW: to allow development in central Shepway, including the strategic Nickolls Quarry development that features in the adopted Development Plan (Local Plan 2006) and that has planning permission.
- At Lydd WWTW: to allow regeneration of the town through a series of smaller sites that are nevertheless critical in the context of the needs and opportunities within the Romney Marsh area, and given the sensitivity of the local natural and hydrological environment.
- At Sellindge WWTW and its catchment network: to establish deliverable solutions and to ensure long-term capacity is maintained on a precautionary basis, given growth options in the Shepway and Ashford districts.
- Although no issues have been identified in relation to Broomfield Bank WWTW, which has seen investment in the recent past, this report acknowledges its critical role in serving the towns of Folkestone and Dover, both of which are central to the development strategies of the district councils (LDFs) (See Appendix 5)

5.8.13 Major developments should only be planned alongside prospective improvements where these are necessary. It is appropriate that strategic proposals in applicable areas are phased in order to keep pace with the development of new infrastructure, i.e., that development cannot occur until sufficient water supply is available. However, no significant capacity issues of this kind have been identified in Shepway. Nevertheless, the aforementioned strategic network issue with the Sellindge WWTWs and associated strategic infrastructure should be addressed by the private sector, and further development details considered through this process may assist in confirming the absence of any capacity issues at all. This will ensure functioning sewage infrastructure and protect essential water quality for natural habitats.

5.9 Summary of Wastewater Findings

5.9.1 This section has highlighted the importance in ensuring sufficient waste water infrastructure to avoid unnecessary pollution, and to maintain sanitary conditions. This report promotes the timely provision of infrastructure through LDF infrastructure planning provisions as required in PPS12, and in the Flood and Water Management Act 2010.

5.9.2 Shepway's settlements have a good coverage of treatment works (WWTWs). Testing in this report and discussion with Southern Water shows that most of them have at present or as planned sufficient capacity to meet LDF growth. The physical capacity of sewers and the treatment capacity of the WWTWs and whether they are able to accept additional connections needs consideration by all parties throughout the process of delivering development. This report's findings confirm the benefits for everyone from early consultation between developer and utility companies in ensuring that requirements are met.

5.9.3 The rural nature of the district means non-mains wastewater arrangements are significant in some localities. However, technological options and regulations are improving and increasingly focusing on protecting the integrity of the hydrological system. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk. Climatic pressures mean wastewater should increasingly be managed 'at source' and SuDS can help address this challenge depending on the local environment.

Chapter 6 FLOOD RISK & COASTLINE

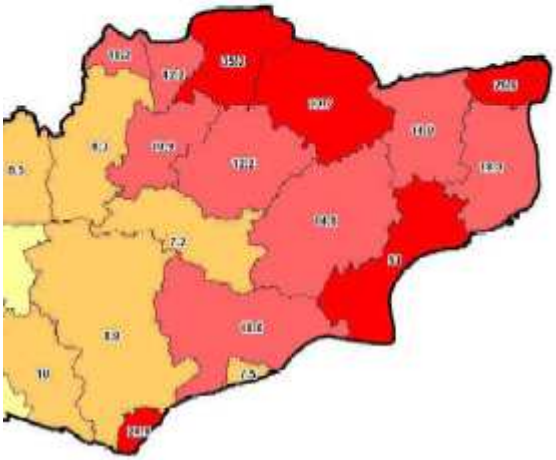
6.1 Introduction

6.1.1 This chapter examines:

- Main flood risks
- Coastline management
- Priority coastal environments

6.1.2 South and east England's landmass is very gradually moving downwards, and this has implications for coastal management even if sea levels were predicted to remain unchanged. However, rising sea levels are anticipated as a result of climate change. The overall result is a projected sustained increase in tidal flood risk for low-lying areas.

6.1.3 Figure 19.0 - Flood Risk



Flooding is an issue for much of Kent. It is particularly acute in Shepway due to the extensive low-lying land, which forms Romney Marsh that makes up the south of the district.

The map shows the south-eastern tip of England (excluding London), and the relative scale of flood risk problems district-by-district. Darker red colours are districts where significant proportion of the local land area is covered by flood zone 3 as defined by the EA.
Source: regional flood risk appraisal.

Not to scale

http://www.southeast-ra.gov.uk/documents/sustainability/rfra_nov08.pdf

6.1.4 Shepway has a long coastline of approximately 23 miles, which is intrinsic to the character of much of the district. The coast is not uniform and varies topographically, geologically and ecologically along its length. Chalk cliffs and coastal scrub in the east give way to shingle and sand in the west. The cuspate foreland that forms Dungeness is of particular significance with ecological sites that are of European significance. Many of the district's major settlements have coastal locations, including Folkestone, Hythe, Dymchurch, New Romney and Lydd. These were originally isolated settlements but linear

development, especially in the post war period, has meant that much of the previously intervening natural coastline has been lost.

6.1.5 On Romney Marsh the need to protect people and their homes from climate change and the threat of rising sea levels has necessitated the need for substantial new coastal defences. Today the only sections of the district's coast that are essentially undeveloped are Folkestone Warren, Hythe Ranges and Dungeness.

6.2 Current Issues Main Flood Risks

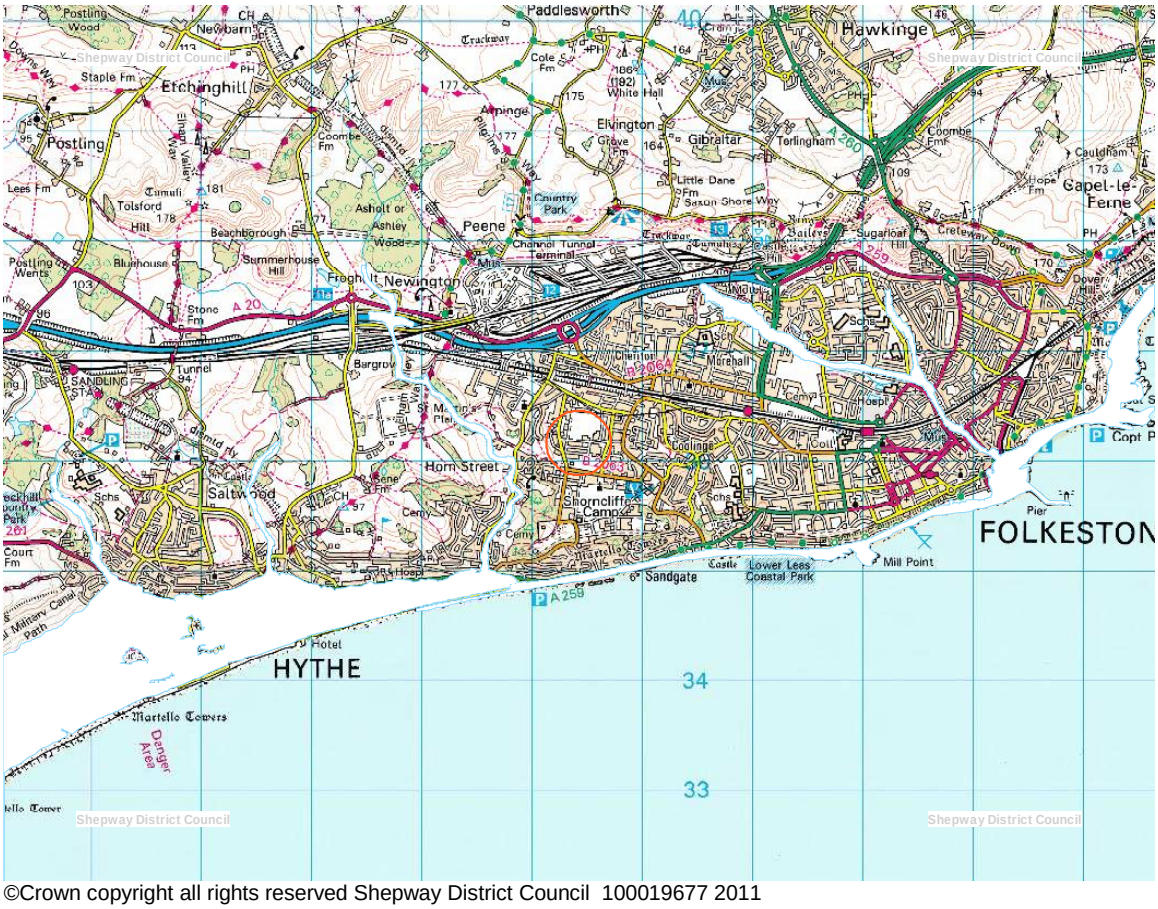
Climate change means an increased likelihood of intense rainfall periods and sea level rises, both of which increase flood risk. In relation to new development in Shepway the severity of risk of flooding from rivers and inland water courses is less significant than possible inundation from the sea, and accordingly studies have had an emphasis on the latter (see later).

6.2.1 EA classifications for flood risk are as follows:

- Zone 1, represents an area where there is low probability of flooding
- Zone 2, an area where there is a medium probability of flooding
- Zone 3, which is representative of an area where there is a high probability of flooding or represents an area of functional floodplain.

Zones 2 and 3 cover the majority of the district, concentrated in the low-lying land of the south, but also relating to streams and rivers. This includes some densely-populated areas, as shown in Figure 20.00.

6.2.2 Figure 20.0 - Flood Zones 2 and 3 for Shepway's urban area



6.2.3 These zones look at inherent risk. The extent of flood risk is based on a scenario in which no flood defences or other man-made obstructions to flood flows exist. The zones are very useful but often forming a starting point for management initiatives or the production of more tailored work on the specific nature of flood hazards in a local area.

6.2.4 Catchment Flood Management Plans (CFMP) are high-level strategic tools based around natural catchments. Through these documents the EA seeks to work with other decision-makers within a river catchment to identify and agree policies for sustainable flood risk management. In Shepway:

- The Stour CFMP includes the catchments of both the East Stour and the Pent Stream.
- The Rother CFMP covers the Romney, Walland and Denge Marsh areas, as well as the catchments of the watercourses in the Hythe and Seabrook areas.

6.2.5 In 2009 the council and the EA commissioned a Strategic Flood Risk Assessment from Herrington Consulting Limited. The Strategic Flood Risk Assessment has refined EA Flood Zone data and is vital for planning in the district. It provides important quantitative risk-based information, which can be used by the council in the preparation of development plans and ensuring that the Sequential Test, which directs vulnerable development away from areas of flood risk, can be effectively applied, therefore minimising risk to life and

damage to property (a key theme of PPS25). It will also allow other users to gain an understanding of the complex and wide-ranging flooding issues that exist within the District.

6.2.6 The key objectives of the SFRA are as follows:

- provide sufficient data and information to enable the council to apply the Sequential Test to land use allocations;
- provide a basis on which the council can prepare appropriate policies for the management of flood risk within the local development documents;
- inform the sustainability appraisal so that flood risk is taken account of when considering strategic land use policies;
- give guidance on the level of detail required for site-specific Flood Risk Assessments (FRAs) in particular locations;
- enable the council to determine the acceptability of flood risk in relation to its emergency planning capability.

6.2.7 The SFRA is not replicated here but it is used to portray the contrasting human impacts of water on developed areas in the form of flooding, especially with reference to tidal flooding[36].

6.2.8 - Table 8 Flood Sources

Flooding source	Explanation	Key strategic development/ spatial implications	Past incidence in towns/villages
Coastal (tidal)	See below	Critical to pattern of development and influential over character of areas within the district.	High in Lydd, Littlestone, St Mary's Bay, Hythe, Sandgate.
Fluvial	From rivers and natural watercourses.	Awareness needed of localised risks to development.	In and around Folkestone/ Hythe, and Elham and Lyminge.
Ground-water	As water levels below the ground rise, typically in winter.	Awareness needed of geology and groundwater management (relationships with water supply, industry and land stability)	Low in general but does feature Lyminge for example.
Non-natural water-courses	From structures such as canals and purpose built flood storage areas (FSA)	Features that contribute to water flow management are important infrastructure which warrants monitoring. See later in this chapter.	The Royal Military Canal flooded in West Hythe in the winter of 2000/2001. The canal and front ditch filled up and flooded the gardens and some ground floor conservatories and at least one kitchen/garage. The potential for flooding remains at West Hythe, and the Mill Leese FSA (Saltwood) also qualifies.
Sewerage network	Limited capacity in the network of combined sewers dealing with both and wastewater flow and surface water.	Awareness of localised implications and context of achieving infrastructure (sewage network) improvements.	High in central urban Folkestone.

[36]Herrington Consulting Limited (2009) Strategic Risk Assessment, Shepway District Council, (2nd Draft), Shepway District Council, Accessed on line, Date accessed 03.02.11, Web site address http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

Surface-water	Direct flooding of overland areas in normally dry valley bottoms or where there are restrictions to runoff. Includes overland flows as culverts etc overwhelmed.	Issues for detailed development design in relation to the location of the development. The SFRA identifies the threat from surface water flooding across the district and Appendix 2 shows historic locations where surface water flooding has occurred.37	Significant areas of Romney Marsh including around New Romney/ Littlestone and pockets in Folkestone, Hythe and Newingreen.

6.2.9 The SFRA shows flooding happens in locations across Shepway and takes many forms, but the most extensive area at risk is Romney Marsh, where some coastal settlements hold potential to be subject to significant risk to lives and property through tidal flooding.

6.3 Future Impacts and Management Main Flood Risks

Given the scale of potential tidal flood risks in Shepway, the SFRA undertook detailed modelling to give a more detailed picture of hazards, and areas of relatively limited risk. This information is complementary to (rather than seeking to replace) the defined flood zones. However, it arguably provides slightly more fine-grained and practical information, with recognition of local factors.

6.3.1 The SFRA modelling included:

- breach of defences analysis - Herrington Consulting, the council's engineers and officers from the EA identified 12 locations from which to assess the impact of a potential breach. These locations were chosen on the basis of defence type, condition, exposure and the likely consequences of a breach
- wave overtopping - during extreme storm conditions the combination of high water levels and large waves can result in significant volumes of water overtopping the seawalls
- combined events - a pragmatic and precautious approach has been adopted based on two dominant storm sectors. Shepway's shoreline has two predominant orientations; south facing and east facing, and therefore when one shoreline is subject to an incident storm, the other will benefit from the relative shelter provided by the other
- combined failures - discussions between the consultants, council's engineers and the EA developed a matrix of events, which presented a worst case scenario

6.3.2 Modelling of events was achieved using a complex computer software package that evaluated the impact of flooding in relation to the criteria that had been developed. The hazard presented by flooding was calculated using an equation that considered the depth and velocity of flooding and the danger caused by debris. The following categories were developed.

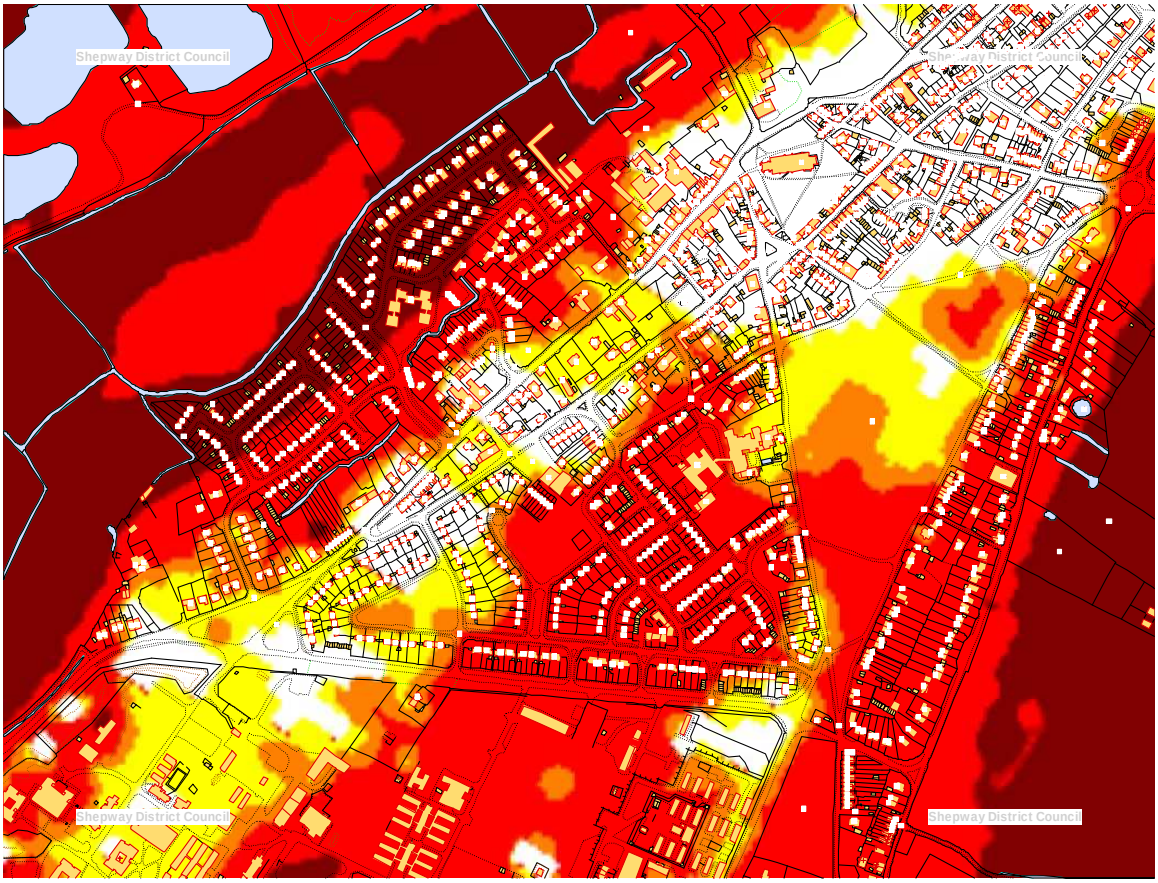
[37] Herrington Consulting Limited (2009) Strategic Risk Assesssmen, Shepway District Council, (2nd Draft), Shepway District Council, Accessed on line, Date accessed 03.02.11, Web site address
http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

6.3.3 - Table 9 Strategic Flood Risk Assessment Hazard Mapping in Shepway

Hazard rating	Colour on mapping	Description
Low (< 0.75)	Yellow	Caution – shallow flowing water or deep standing water
Moderate (0.75 to 1.25)	Orange	Dangerous for some, i.e. children – deep or fast flowing water
Significant (1.25 to 2.5)	Red	Dangerous for most people – deep fast flowing water
Extreme (> 2.5)	Dark (red)	Dangerous for all – extreme danger with deep and fast flowing water

6.3.4 These categories were applied to the district using the existing climatic conditions; a second data set was prepared for flood risk with the impact of climate change. Both of these scenarios are represented geographically on two sets of maps that are contained with the evidence base that the council is collating for the Core Strategy. They can be viewed at: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

6.3.5 Figure 21.0 - Example extract of SFRA hazard mapping (with climate change) – Lydd



Not to Scale

6.3.6 As a result of tidal flood hazards, plus the potential for flooding from a range of other sources, the SFRA set out eight important policy recommendations. These cover flooding (for example avoiding new residential allocations or infill development in the 'Extreme' hazard areas) and associated issues such as waves overtopping seawalls. The recommendations are split equally between guiding the location of development and controlling the design/construction of development, but two recommendations in particular are noteworthy to this report:

- *"To help reduce the rate and volume of surface water runoff and to improve the quality of the water passed on to watercourses, new development should incorporate the principles of SuDS in its drainage design wherever practically achievable.*
- *To ensure that any new development does not have an adverse impact on drinking water resources. This can be achieved through the reference to the Source Protection Zone maps published by the EA and by encouraging the use of rainwater harvesting and grey water recycling systems."*

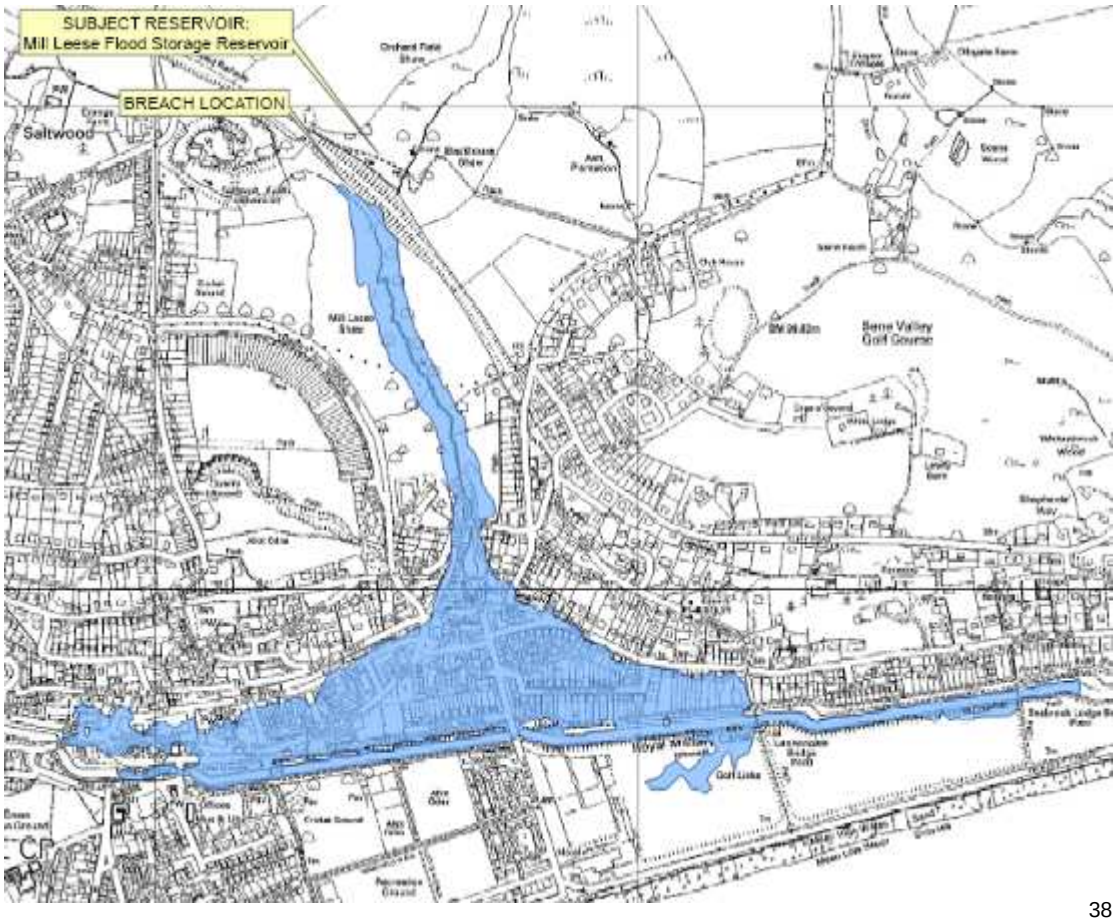
This endorses recommendations of this report in previous chapters.

6.3.7 These both highlight the importance of sustainable construction measures in the design of new developments through the water cycle. More efficient management of water resources at the point of collection can achieve reduced demand, but also bring beneficial flood management results, for example, by smoothing out ‘surges to the system’ from the increase in high intensity rainfall events anticipated with climate change.

6.3.8 Recent changes to development potentially impacted by flooding from man-made structures provide an example of the increased concern for flood risks in planning future development. Kent County Council now has an emergency planning responsibility for water bodies categorised as reservoirs under the Reservoirs Act 1975. This change is informed by Sir Michael Pitt's inquiry into the summer floods of 2007, which called for enhanced reservoir safety measures, following the breach that was narrowly averted at the Ulley Reservoir in Yorkshire. See Appendix 6 for further details.

6.3.9 Consideration has been given to the scale of flooding were reservoirs to be breached. In Shepway the applicable waterbodies are Hart reservoir (north of Folkestone) Little Cheyne Court (south western Shepway) and the Mill Leese (Hythe, see Figure 22.0).

6.3.10 Figure 22.0 - Inland water way flood scenario



38

Not to Scale

6.3.11Relevant development in the associated area of identified potential risk (illustrated above for the Mill Leese example) will in the future require a detailed evacuation plan for the building as a condition of getting planning permission. This regulatory response is required in the interests of the safety of the occupiers of the building.

6.3.12This highlights the need for an integrated approach to water management and spatial development. Further flooding issues for future strategy relate to the approach taken to coastal management and defence.

6.4 Current Issues Coastline Management

6.4.1Coastal management is dealt with through a variety of bodies and documents, and this report integrates their findings in relation to Shepway's coast and seeks to inform spatial planning decisions that arise as a result.

6.4.2The starting point for examining the coast is the Shoreline Management Plan (SMP), and its associated documents. Whilst the SMP is not a statutory planning document, it does set policy for the management of the shoreline over the next 100 years. Consequently, the SMP is an important document

[38] Reproduced with permission from the Environment Agency

when appraising shoreline management options and the risk of coastal flooding on a regional and local scale. The South Foreland to Beachy Head SMP, along with its recommended management policies, was adopted by Shepway in 2006.

6.4.3 The shoreline management policies stem from government options for coastal change of:

- *Hold the line*
- *Advance the line*
- *Managed realignment*
- *No active* intervention

The SMP achieved recommendations by breaking up the 105km stretch of coast into twenty-seven individual stretches called 'management units'. Shepway's long coastline includes around one third of the management units, reflecting its urban and rural diversity and range of coastal processes.

6.4.4 Planning Policy Statement 25: *Development and Flood Risk* was supplemented in 2010 in relation to Development and Coastal Change. This document, and associated Practice Guide, seeks a step-by-step approach to coastal planning of:

1. Appraising risk using the SMP and related documents.
2. Identifying any risk areas accordingly (to be defined as Coastal Change Management Areas, if applicable)
3. Avoiding risk in development, or if not possible
4. Managing risk in development, and
5. Mitigating impact of development.

6.4.5 The PPS25 supplement requires an LDF to address the risks and issues raised by their SMP within the context of all relevant national planning policies and related evidence. The SMP forms evidence for the LDF Core Strategy, guiding the scope of necessary policy, such as whether a coastal erosion policy is required.

6.4.6 PPS25 supplement and its guidance stipulate CCMA will only be defined where rates of shoreline change are significant over the next 100 years, taking account of climate change. These are areas likely to be affected by significant physical changes to the coast such as erosion, coastal landslip or permanent inundation. This report considers if a formal Coastal Change Management Area is appropriate for Shepway. If this is the case, then there is a need to consider planning provisions to focus the kind of development acceptable in the area, and plan development in alternative locations as necessary.

6.5 Future Impacts and Management Coastline Management

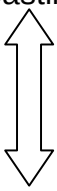
6.5.1The PPS25 supplement considers SMPs can fulfill a similar role to that of a SFRA, in that they provide the means of identifying the risks for a local area and proposals on how to manage them. In contrast to SFRA which influences development location and design inter alia, the SMP primarily guides the planning of public investment and coastal infrastructure in terms of flood defence. This report refers directly to the SMP to these ends, but considers

the document in light of subsequent activity and shoreline management policies.

6.5.2 Planning coastal defence in a genuinely sustainable manner requires a long term view to be taken. This suggests that allowing adjustments to take place to a more natural shoreline should be considered. Existing development and commitments to future development mean that opportunities to pursue this objective may be limited, and the Shoreline Management Plan identifies several management units where, in the longer term, realignment of the coast might be considered.

6.5.3 The outcomes of the current SMP for each shoreline local 'management unit' are outlined in Table 10:

6.5.4 - Table 10 Shoreline Management Plan Units

Management unit	Location	SMP Policy: 2006-2025 & 2026-2055.
Folkestone Warren	Easternmost Shepway coastline  Westernmost Shepway coastline	'Hold the line'
Copt Point		'No active intervention'
Folkestone and Sandgate		'Hold the line'
Sandgate to Hythe		
Hythe Ranges		
Dymchurch Redoubt to Romney Sands		
Romney Sands to Dungeness Power Station		
Dungeness Power Station		
Lydd Ranges		'Managed realignment'

6.5.5 The time horizon for this report flows from the LDF Core Strategy, and is therefore relatively long-term, but does not look specifically towards the next century unlike the SMP. Accordingly only the policies for 2006-2025 and 2026-2055 are shown here (and the recommendation is the same for both periods in all Shepway units) not the last SMP period.

6.5.6 The implications of these policies are now considered. The SMPs considerations can perhaps be seen as aiming predominantly to ensure a 'stable' coastline in terms of its current delineation. This can be seen as most management units in the district are recommended to hold the line, which in some instances necessitates capital investment to maintain or construct flood defence infrastructure. Holding the line clearly benefits coastal communities, and is the approach covering all urban areas, with the exception of Copt Point, where it was concluded objectives could be met through no active intervention, described by the SMP as "a decision not to invest in providing or maintaining defences". Copt Point is an east facing coast lying northeast of Folkestone town centre: generally cliffs and rocks in form. The more anomalous policy is an approach of managed realignment for the Lydd Ranges management unit, which is considered in further detail in the following sections.

6.5.7 Before the SMP is reviewed again, a South Foreland to Beachy Head Action Plan[39] has been prepared. The Action Plan has aims including:

- facilitating implementation of the SMP policies;
- identifying and/or promoting studies to further/improve understanding where this is required to resolve policy and/or implementation;
- promoting use of the SMP recommendations in spatial planning;
- initiating a future SMP review.

6.5.8 The Action Plan is important in confirming the way forward for coastal management. It highlighted specific actions for spatial planning, including noting responsible parties, and the significant ones of which are noted below:

6.5.9 - Table 11 SMP Action Plan

Action	Responsibility	How addressed in this Report
Adoption of preferred policy 'risk zones' as development planning consideration. High priority.	Local Authority and EA Planning Officers	The SFRA provides the means by which to assess areas at particular risk of flooding for the present day and with the affects of climate change. This document develops Environment Agency data and work on this subject would be undertaken in association with the Environment Agency.
Promote the development of planning policies to address potential housing stock losses through implementation of 'realignment' and 'no active intervention' policies	Local Authority and EA Planning Officers	Concluded that generally inapplicable to Shepway's LDF. No stock losses are expected in relation to the no active intervention unit (Copt Point) and the SHLAA shows no future residential development opportunities have been identified in the vicinity. The issue of possible realignment (Lydd Ranges) is dealt with below.
Assess the strategic requirement for habitat creation as a result of implementing the short, medium and long term policies on European sites.	Local Authorities, English Nature, and EA.	English Nature is currently reviewing the boundaries of the SPA on Dungeness and investigating the establishment of a Ramsar site at Dungeness/Romney Marsh. If validated these changes will have a significant impact on the responsibilities for the council and the management of the area. At the time of writing this document the council has engaged Jacobs as a consultant to assess Natural England's proposal for the extended SPA and Ramsar and review the implications for the council. With significant changes likely the council will await the outcome of these investigations before fulfilling these objectives.
Investigate possible locations for habitat creation. This should be done in conjunction with LDF development allocations, catchment management plans and flood management strategies.	English Nature, EA and Local Authorities.	

6.5.10 The SMP approach to Lydd Ranges clearly warrants further investigation. This process is underway through the Folkestone to Cliff End Strategy Flood and Erosion Management Strategy. This was issued as a draft for consultation in May 2008 and the EA has approved the strategy and Defra's Wildlife Habitat and Biodiversity Division (WHBD) have agreed the habitat regulations assessment.

6.5.11 This document sits beneath the SMP and makes recommendations for implementing flood and coastal erosion risk management schemes. The recommended strategic options include a number of large capital schemes within the district that are planned for construction within the next 10 years, including the coast near Dymchurch and Lydd. The SFRA describes them as following:

[39] http://www.se-coastalgroup.org.uk/main.cfm?objectid=117

- *At High Knocke to Dymchurch*, the proposed flood risk management option for this frontage is to improve the standard of protection by undertaking capital improvement works to the existing seawall.
- *At Lydd Ranges*, the proposed option for this frontage is to hold the line by raising and reinforcing the Green Wall, recharging the shingle beach and constructing timber groynes along the shoreline. The strategy acknowledges that this is not in line with the SMP policy of managed realignment. However, this was determined to be unachievable at present due to the MoD's requirement to operate within the full footprint of the Lydd Ranges.

6.5.12 It is understood through information supplied by the MoD as part of the LDF process that it is now planning a relative intensification of operations in the Lydd area and therefore it is even more salient that the management strategy found the SMP managed realignment approach to be undeliverable. Other major work is prioritized and being actively planned out for Hythe Ranges.

6.5.13 With the Management Strategy in place, this report considers that there is no prospect of managed realignment of the coast within the LDF Core Strategy time period. Using the SMP and associated documents, it is found that although tidal flooding will continue as a critical spatial planning issue in Shepway, there is no clear need under the horizons of current spatial planning for a designated CCMA under Planning Policy Statement 25 Supplement: Development and Coastal Change. The provisions of coastal management plans will nevertheless remain of critical importance to the LDF and future development of the district.

6.5.14 Given the key risks as confirmed by this evaluation, the SFRA will remain of critical and increasing importance to spatial policy on the shorter-to-medium term horizon, informing LDF strategy and day-to-day planning decisions.

6.6 Current Issues Priority Coastal Environments

6.6.1 Whilst previous chapters have focused on the impact of day-to-day human life on the hydrological cycle - the water we use and waste we create – predominantly non-urbanised areas are clearly important to the approach of this report and examination of natural systems. To this end, this section takes forward the linear analysis of the rural coast (Shepway's central and southern coastline) by taking forward the identified issue in section 2.5 of coastal nature conservation and the distinct character of semi-natural marine environments.

6.6.2 This closer investigation shows that development is not a continuous strip along the coast, the communities either forming discrete settlements or developments broken up, or not lying on the immediate coastline.

6.6.3 Post-war housing characterises much of the coastal route, and some developments have occurred outside of recognisable settlements. However, evaluation reveals this environment is less prevalent along the coastline itself, with the 'more hidden' coastline at Lydd Ranges and Dungeness being more

significant (or a strip of housing just set back, as at Lydd-on-Sea). At the southern end, before Dungeness point, the built form is reduced to a strip a single dwelling in depth, fronting onto the coastal road and wide tidal beach, as the following aerial photo reveals:

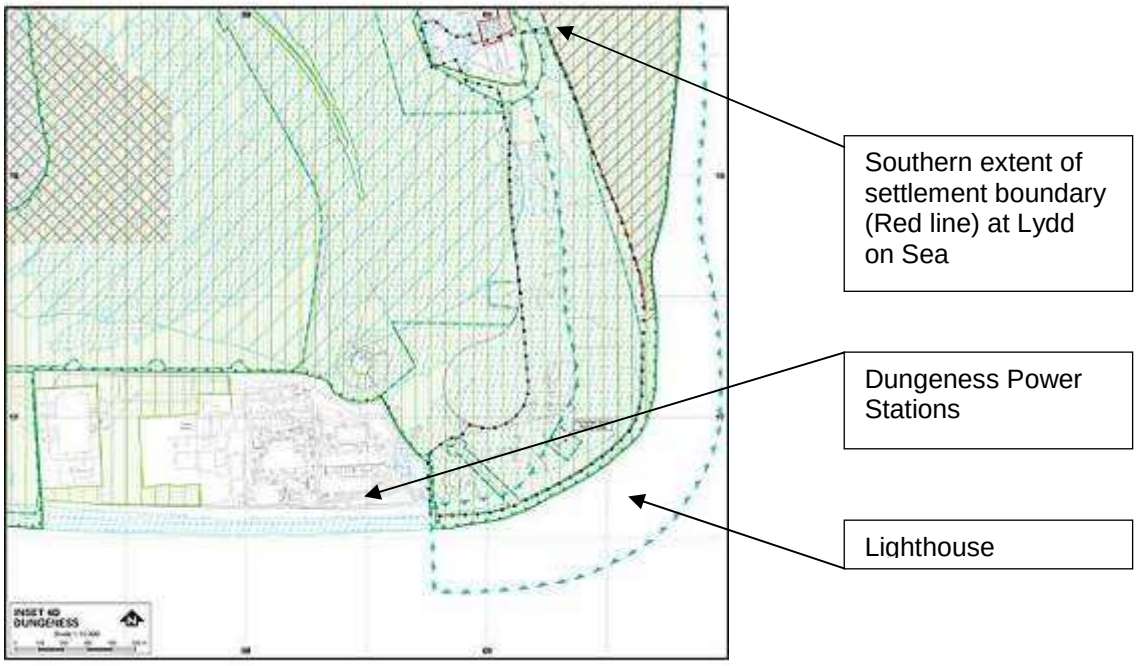
6.6.4 Figure 23.0 - Typical coastal development Dungeness

6.6.5 The clear majority is of scientific or landscape interest and covered by a wide range of designations, which sometimes have similar objectives. This includes an extensive nature designation at Hythe Ranges (nearly 2km) but is predominantly in relation to the multiple features at Dungeness. The geography of the district is increasingly complex and interesting at this southern point of the district, perhaps reflecting that, in Romney Marsh in general, many environmental features distinctive across the area derive from its water-related and coastal origins.

6.6.6 The Dungeness Conservation Area Appraisal[40] describes Dungeness as a unique combination of stark, open, coastal landform, the world's largest expanse of shingle, a protected nature reserve of some 8,000 acres and, of course, a large and varied collection of characteristic 'beach house' type buildings. The following extract from the proposals map from the Shepway District Local Plan Review 2006 shows the nature of designations in Dungeness.

[40]Conservation Architecture and Planning (2006) Shepway District Council Conservation Area Appraisal Dungeness, Conservation Architecture and Planning, Accessed on line, Date accessed: 07.02.11, Web site address: http://www.shepway.gov.uk/UserFiles/File/pdf/local-plan/conservation/DungenessCAADraft241007-section-1.pdf

6.6.7 Figure 24.0 - Extract from Local Plan (2006) proposals map



Not to Scale

6.6.8 This map extract includes over half a dozen nature and landscape conservation related designations. This special environment continues to the west in terms of the distinctive landscape and internationally protected habitats. This area towards the boundary with Sussex (Lydd Ranges coast), however, is relatively free in parts from current anthropogenic intrusions which has highly limited public access and no man-made sea defences.

6.6.9 It is no coincidence that the largest and most important areas sustaining biodiversity in the district have coastal locations. The special characteristics of places such as the Dungeness 'peninsular' are attributable to factors such as geomorphology, but are also related to rare species, many of which are sensitive to hydrological factors. This part of the report looks at the most prominent coastal habitats, not just as an example of a precious coastal environment, but also to illustrate the wider impact of water related concerns on biodiversity and climate change resilience.

6.6.10 There is wide awareness that the quantity and quality of water impact on ecosystems, for instance pollutants within water, spread rapidly affecting both animal and plant communities. The interaction of natural coastal processes, human intervention and climatic change can pose particular issues for habitats, for example, the action of 'coastal squeeze'.

6.6.11 Scott Wilson Draft Appropriate Assessment Screening Document (*Factual Update 2009*) explains actions within coastal squeeze as follows:

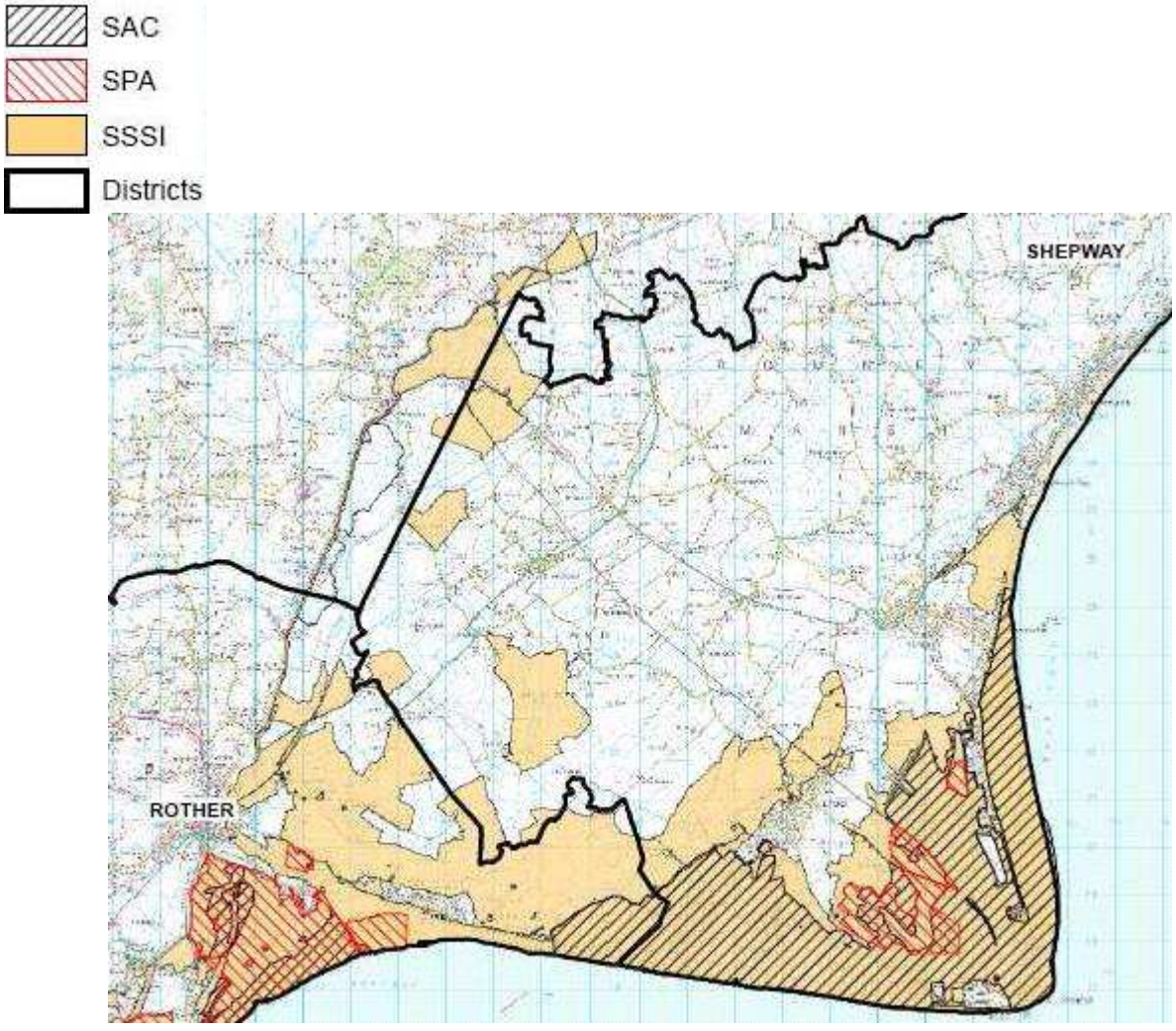
"Rising sea levels can be expected to cause intertidal habitats (principally saltmarsh and mudflats) to migrate landwards. However, in built-up areas, such landward retreat is often rendered impossible due the presence of the sea wall and other flood defences.
In addition, development frequently takes place immediately behind the sea wall, so that the flood defences cannot be moved landwards to accommodate managed retreat of

threatened habitats. The net result of this is that the quantity of saltmarsh and mudflat adjacent to built-up areas will progressively decrease as sea levels rise. This process is known as 'coastal squeeze'."

6.6.12 This means that there is a need for substantial action, including addressing the implications of flood risk management structures and sea level rise[41].

6.6.13 The relationship with coastal defence provisions and development means that coastal squeeze is relevant to the towns possibly as much as countryside areas. Sites of significant biodiversity interest are protected by European designation. Dungeness is recognised as being especially important in terms of its flora and fauna (see 6.6.14 Figure 25 and 6.6.15 Table 12,).

6.6.14 Figure 25.0 - Ecologically Sensitive Areas



[42]

Not to Scale

[41] Including creating significant new intertidal habitats (over 100ha in England) to maintain the coherence of international priority nature conservation sites: Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, Scott Wilson & SDC, Accessed on line, Date Accessed 04.02.11, Web site address: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

[42] Scott Wilson (2008) Draft Appropriate Assessment Screening Document with factual update by SDC June 2009, p. 37 Scott Wilson & SDC, Accessed on line, Date Accessed 04.02.11, Web site address: http://consult.shepway.gov.uk/portal/core_strategy/core_strategy_po?tab=files

6.6.15 - Table 12 European Recognised Areas

European Habitat	Dungeness to Pett Level Special Protection Area	Dungeness Special Area of Conservation
Features of European Interest (why site designated)	For supporting bird populations of European importance for the species of: Common tern, Little tern, Mediterranean gull, Bewicks swan, Shoveler, and Aquatic warbler.	For its annual vegetation of drift lines; Coastal shingle vegetation outside the reach of waves; and Great crested newt.
Condition Assessment	During the 2007 Condition Assessment Process the majority of the SAC was found to be in either favourable condition or recovering from unfavourable condition.	The 2007 Condition Assessment Process found the majority of the SAC to be in favourable condition. From examination of the UK Air Pollution System (www.apis.ac.uk) it can be seen that the SAC is currently suffering from poor air quality. Dungeness SAC currently exceeds the minimum critical load for nitrogen deposition.
'More water cycle' related key environmental conditions required to support the features of European interest	Including: **Unpolluted water** Absence of nutrient enrichment **Balance of saline** and non-saline conditions. **Freshwater inputs** are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking. Sufficient space between site and development to allow for managed retreat of intertidal habitat and **avoid coastal squeeze**.	Including: • **Maintenance** of hydrological regime; • Relatively unpolluted water of roughly neutral pH; • Some **ponds deep enough** to retain water throughout February to August at least one year in every three. • Maintenance of **un-shaded pond habitat** for breeding newts.
'Other' key environmental conditions required to support the features of European interest	Maintenance of grazing/ mowing regimes, absence of non-native species, control of predator numbers, maintenance of suitable grassland on adjacent land for off-site grazing and roosting, and minimal disturbance.	Low recreational pressure, especially from vehicles (erosion of shingle vegetation); minimal air pollution, in a wider context great crested newts require good connectivity of landscape features (ponds, hedges etc) as they often live as metapopulations in a number of pond, and suitable foraging and refuge habitat within 500m of newt breeding ponds.

Derived from Draft Appropriate Assessment Screening Document (Factual Update 2009)

6.7 Future Management of Priority Coastal Environments

6.7.1 The current development plan (Local Plan 2006) does not include an integrated coastal management policy. However, there are a plethora of nature conservation provisions, and some stretches of coastline are highlighted for additional reasons. Policy CO6 of the Local Plan highlights:

- The Folkestone-Dover shoreline (for heritage reasons)
- Undeveloped shorelines (at West Hythe, Dymchurch, St Mary's Bay and Dungeness).

Contrasting with this, section 2.5 found some of Shepway's coast devoid of any specific spatial local policy (other than generalised 'countryside protection' for areas outside of defined settlements, policy CO1). The findings of this chapter of the report suggest that the effectiveness of this approach should be reviewed compared to a more integrated coastal management strategy. It is recommended that a universal but spatially targeted coastline policy be considered as a possible key principle of the LDF in order to manage this priority environment.

6.7.2 It is clear, however, from the wide-ranging approach of this report that this some recurrent matters are of pre-eminent importance to the coast. Alongside flood risk, the future of sensitive natural habitats is clearly of critical significance along the majority of Shepway's coastal environments. Shepway has a rich and diverse range of habitats, many of which are extremely sensitive to water quantity and quality. Some of the most sensitive were featured above:

- Dungeness Special Area of Conservation - the UK's largest shingle structure and represents the habitat type on the south-east coast of England. In summary, the unshaded pools, relatively unpolluted water and hydrological regime are important to the health of the site.

- Dungeness to Pett Level Special Protection Area - this large area contains a wide variety of coastal habitats, ranging from shingle beaches through to various types of wetlands and open water. The large deposits of gravels that make up much of this area act as a store of fresh water. This is known as the Denge Gravels aquifer, and the status of much of this designated site is heavily dependent on the quantity and quality of the water stored within it. Public drinking water is abstracted from this source and it is important that the water taken from the aquifer does not affect the quality of the resource. To summarise for this site, freshwater inputs, clean unpolluted water equilibrium between saline and non saline conditions are key to importance here.

6.7.3 The overall health of these habitats is obviously linked to the quality and quantity of water in them. The impact of development on these European habitats is carefully controlled under Habitats Regulations, and the LDF Core Strategy will be subject to an Appropriate Appraisal of proposals (the first stages of which are utilised in Section 6.6).

6.7.4 Apart from this, water quality is normally managed through regulations outside the LDF. However, this perspective increases imperatives for the EA and partners to be supported in securing objectives such as those enshrined in the Water Framework Directive.

6.7.4 In terms of excess water demand, a review of licenced abstractions impacting on the Dungeness Special Area of Conservation is being undertaken. Over-abstraction is detrimental to water-dependent ecosystems resulting in a decrease of biodiversity. In order that such sensitive environments remain healthy, water abstraction must be limited to levels that can be replenished by natural systems. The WRMP (p. 24) confirms that the licensing regime for abstraction will be amended in due course in this area.

6.7.5 In relation to ecosystems along the district's coast, this report accepts the recommendations in the Draft Appropriate Assessment Screening Document (Factual Update 2009) that:

> "Although the contribution of climate change to coastal squeeze cannot be avoided, some of the resulting 'squeeze' can be avoided through careful siting of new development, and management of existing development."

The LDF should consider the most feasible means by which coastal squeeze can be prevented. The Screening Document's recommendation was made to protect the integrity of international habitats. However, the principle may apply elsewhere. The issue could be addressed in development management issues in urban - as well as rural - coastal areas.

6.7.6 However, it has been shown that mitigation is likely to be required, alongside management (and preferably avoidance). This report acknowledges South Foreland to Beachy Head Action Plan's actions for spatial planning, and accordingly, it is recommended that opportunities for securing further habitats for coastal biodiversity purposes be explored (if formally addressed in the LDF, this is expected to be most appropriate to deliver through an allocations DPD).

6.8 Summary of Chapter Findings

6.8.1 Specific recommendations on coastal environments and flooding are made above (underlined). To both manage flood risk (from tidal and other sources) and to better manage increasingly pressurised water demand/supply balance in Shepway, all the recommendations of the SFRA on development location and design are fully supported and should be considered in the LDF.

6.8.2 The evaluation of the SMP and all associated documents and prospects for its implementation in Shepway reveals that although a CCMA is regarded as inapplicable for this LDF, coastal defence measures to hold the line will be central in managing flood risk to existing communities. Accordingly, the LDF must plan for the sustainable delivery of public investment in coastal management, both in terms of infrastructure planning and ensuring factors such as coastal squeeze, are addressed.

6.8.3 The planning of coastal environments in the LDF should include consideration of provisions to secure the status of further special marine or water sensitive habitats.

SECTION C – CONCLUSIONS

Section C defines the key aspects of the report that will be carried forward into LDF policy. It also promotes a list of recommendations that will contribute to the sustainable use of water in the district in accordance with the LDF.

Chapter 7 CONCLUSIONS

This report has integrated a range of perspectives, issues and studies from topics across the water cycle. It provides a snapshot but also looks forward in relation to local planning policy (LDF) options.

This report has demonstrated the complex range of issues that relate to water and development within Shepway; nevertheless there are many ways that the report shows water management could be integrated further. This report's findings can be summarised around the following broad questions:

- Is there enough water to supply the development proposed without having an adverse affect on the environment?
- Can an increase in the volume of waste water be treated without having an adverse impact on the environment?
- Has sufficient consideration been given to flood risk?

Accordingly, there has been specific confirmation that sufficient future water resources will be available under the provisions of the Water Resources Management Plan (e.g. water efficiency measures) to meet managed demand with a growth level of 400 dwellings per year, and without adverse environmental impact. Similarly, there is expected to be wastewater infrastructure in place to meet all prospective areas of significant housing growth (notwithstanding confirmation of the need to deliver upgrades in the Westenhanger/Sellindge area), which will help ensure Water Framework Directives can be addressed.

The strategic sites that have been considered for inclusion in the Core Strategy have all been examined in relation to the council's strategic flood risk assessment that provides a reasonable insight into the severity of flood risk under existing climatic conditions and with climate change.

Recommendations for the planning system, and especially Shepway's development plan (LDF) recognising the need to safeguard the district's water reserves, as considered by this report are summarised below:

1. Reflecting an appropriate role for strategic planning in delivering WFD objectives (in Chapter 4)
2. Maintaining and enhancing the integrity of groundwater, and ensure proper local wastewater connections are in place (in Chapter 4)
3. Supporting the maintenance of water resources through multi-pronged demand management measures, such as appropriate increases in efficiency through setting development standards (e.g. the Code for Sustainable Homes) rather than substantial new strategic infrastructure (in Chapter 5)
4. Supporting, as practicable, water companies in promoting widespead water efficiency measures in Shepway for all users and sectors (including potential savings from existing stock, e.g. retro-fitting measures) (in Chapter 5)
5. Ensuring planning provisions continue to help manage the demand on, and capacity of, strategic wastewater infrastructure (in Chapter 5)
6. Continuing the current regime of shoreline management by implementing existing management proposals, supported by use of the SFRA in spatial planning to tackle the primary risk for coastal communities that of inundation by tidal flooding (in Chapter 6)

7. Considering an integrated coastal zone policy to guide the LDF and strategy for this key environment; this could include the defence and creation of coastal habitats and climate change adaptation as the primary coastal environmental objective (in Chapter 6)

8. Planning in advance to align the delivery of key strategic infrastructure and Strategic Sites. (see Appendix 7)

Summary of way forward for lead partners, by thematic issue:

Water Supply

Local Planning Authority, utility companies: WRMP is central. It is applicable for the LDF; increased efficiency is needed and the planning system should consider actions to augment and support design/construction demand management.

Residents, businesses, landowners and utility companies: Water saving measures in existing homes, and potentially from non-domestic sources, are very important in reducing average consumption in Shepway.

Waste Water Treatment

Local Planning Authority, utility companies and developers: Forward planning for infrastructure for WWT is significant due to the lead in times that it can take to plan for strategic infrastructure, and planning certainty is needed for long-term investment, and therefore it is imperative that appropriate provisions are made in the LDF and planning permissions.

Landowners and Environment Agency: There is also the potential for better management of land and design features of accommodation to minimise impacts on wastewater infrastructure and the environment.

Flood risk

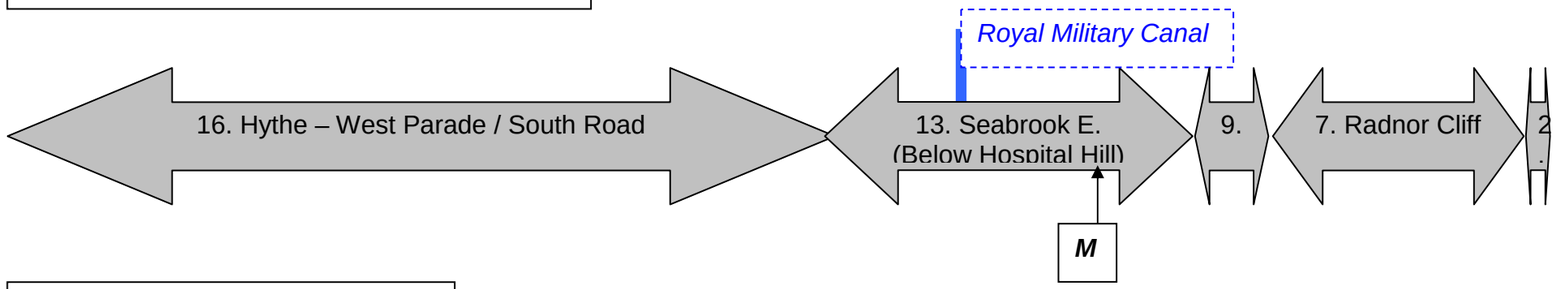
Environment Agency and Local Planning Authority: Plan infrastructure and guide development to avoid and minimise risk, co-ordinate interventions for a better designed built environment and more sustainable natural environment.

Protection/promotion of coastal habitats

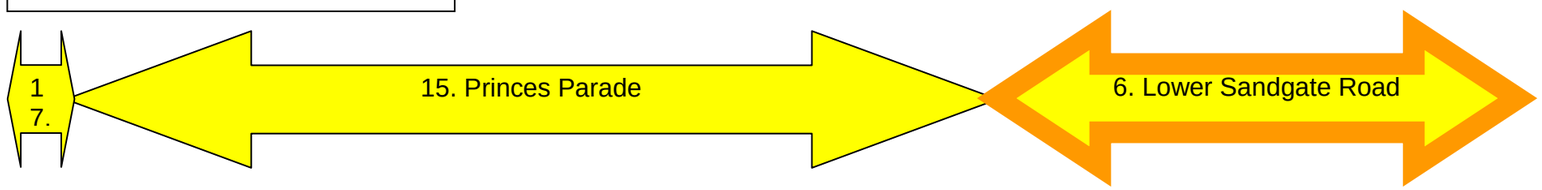
Utility companies, Local Planning Authority, Natural England, Environment Agency: Protect ecology through integrated hydrological management and to mitigate impact of climate change, through a co-ordinated approach to ‘blue infrastructure’ and ‘green infrastructure’ assets.

APPENDIX 1: An indicative linear analysis of the urban coastline by Local Plan designation, illustrated to approximate scale (1cm=1km)

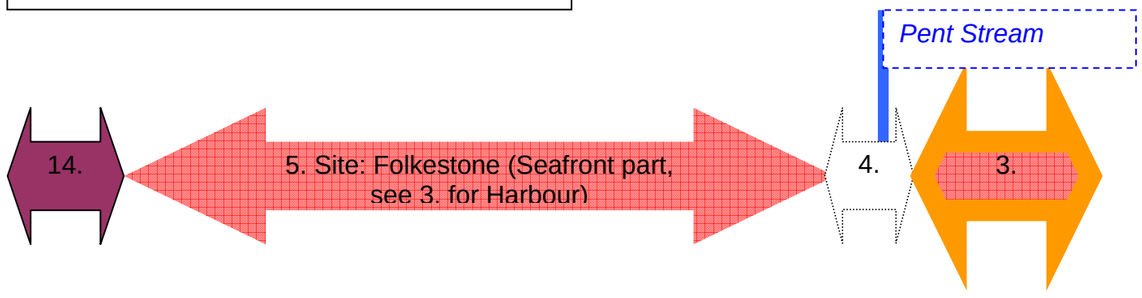
UNDESIGNATED (IN SETTLEMENT) ~2.5KM



LEISURE DESIGNATIONS ~2.4KM



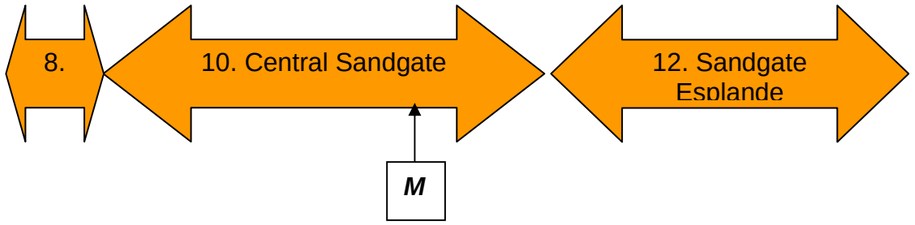
REGENERATION DESIGNATIONS ~1.8KM



This process is a simplification that illustrates the relative importance of contrasting spatial development priorities along the coast. This creates section lengths depending on their use or intended function, although this should be considered as an indicative overview not 'scientific', as the definition or sections is to some extent lead by cartographic presentation

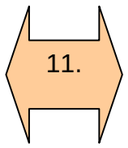
The coastal frontage broken downs are grouped by broad purpose. This page shows the most significant (lengthy). See the colour coding and key (below) for specific designation. All 17 sections are numbered from east (1) to west. Selective frontages are named.

CONSERVATION (BUILT ENVIRONMENT) ~1.5KM



CONSERVATION (NATURAL ENVIRONMENT) Outside settlement ~0.8KM

POTENTIAL LAND INSTABILITY AREA ~0.2KM not included above



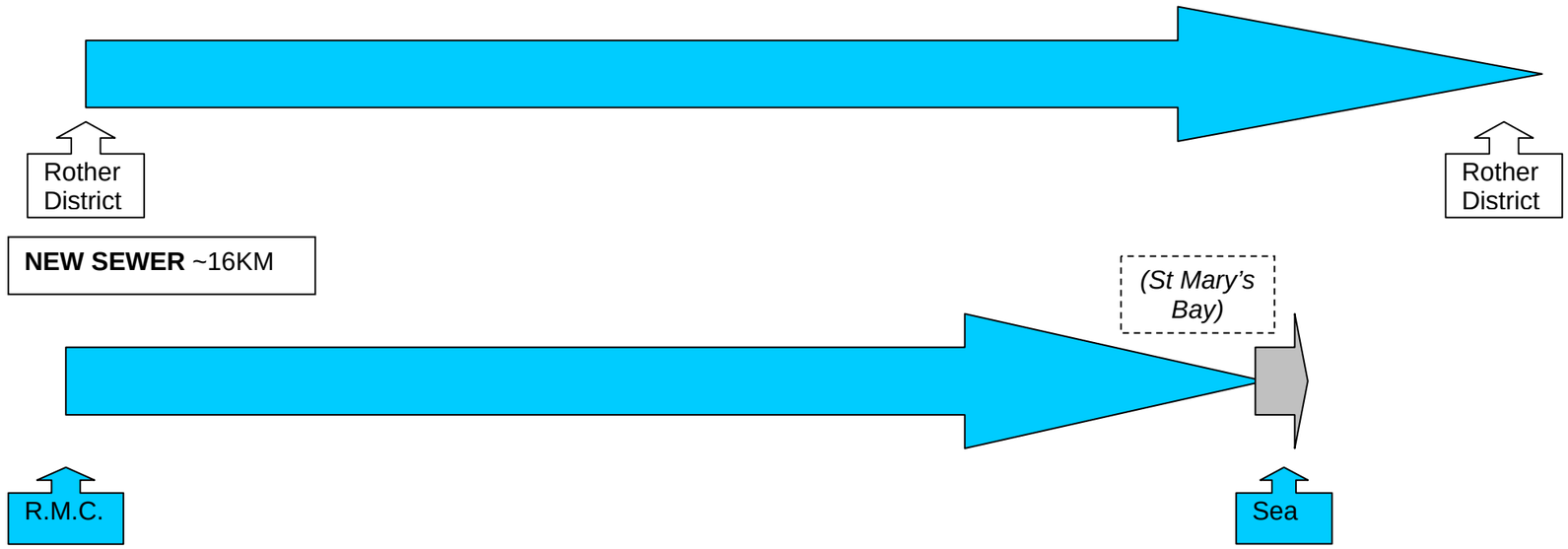
M- Scheduled Ancient Monument e.g. Martello Tower etc.
Grey – in settlement boundary (CO2)
Yellow – leisure (LR policies)
Purple – tourism (TM8)
Pink – development allocation (site)
Clear – railway bridge taken as shoreline
Orange – conservation area / BE12
Light blue – heritage coast (national)
Light green – AONB (national)
Tan – land instability (BE19)

APPENDIX 2: An indicative linear analysis of the main watercourses, illustrated to approximate scale (1cm=1km)

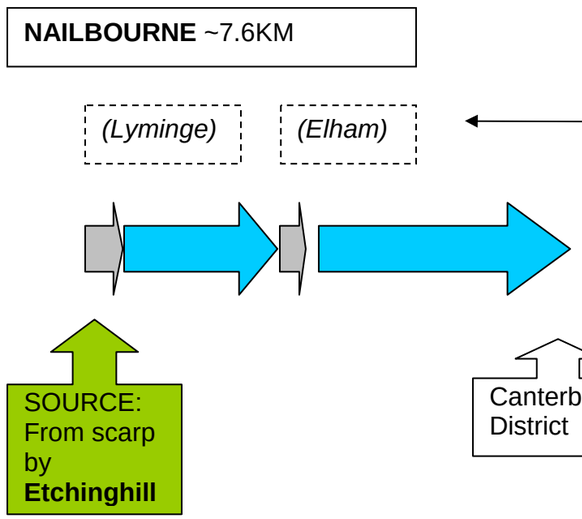
This process is a simplification that illustrates the relative importance of contrasting spatial development priorities along the longer watercourses in Shepway. This creates section lengths depending on whether inside or outside the Local Plan (2006) Proposal Map's definition of settlement boundaries (open countryside or not. This should be considered as an indicative overview not 'scientific'. An annotated example is included on the next page.

Although agreeing the primary route of watercourses is notoriously difficult (and has on occasions reached the heights of the Houses of Parliament in the past) this has been informed by Ordnance Survey mapping down to 1:25,000 scale. This evaluation does not cover secondary branches of watercourses, and certainly does not include all significant water features on Romney Marsh – being focused on two most recognisable waterways there. This arose from tracing the primary course of streams as defined by the *main watercourse* Shepway GIS layer).

JURY'S GUT / WHITE KEMP SEWER ~23.8KM



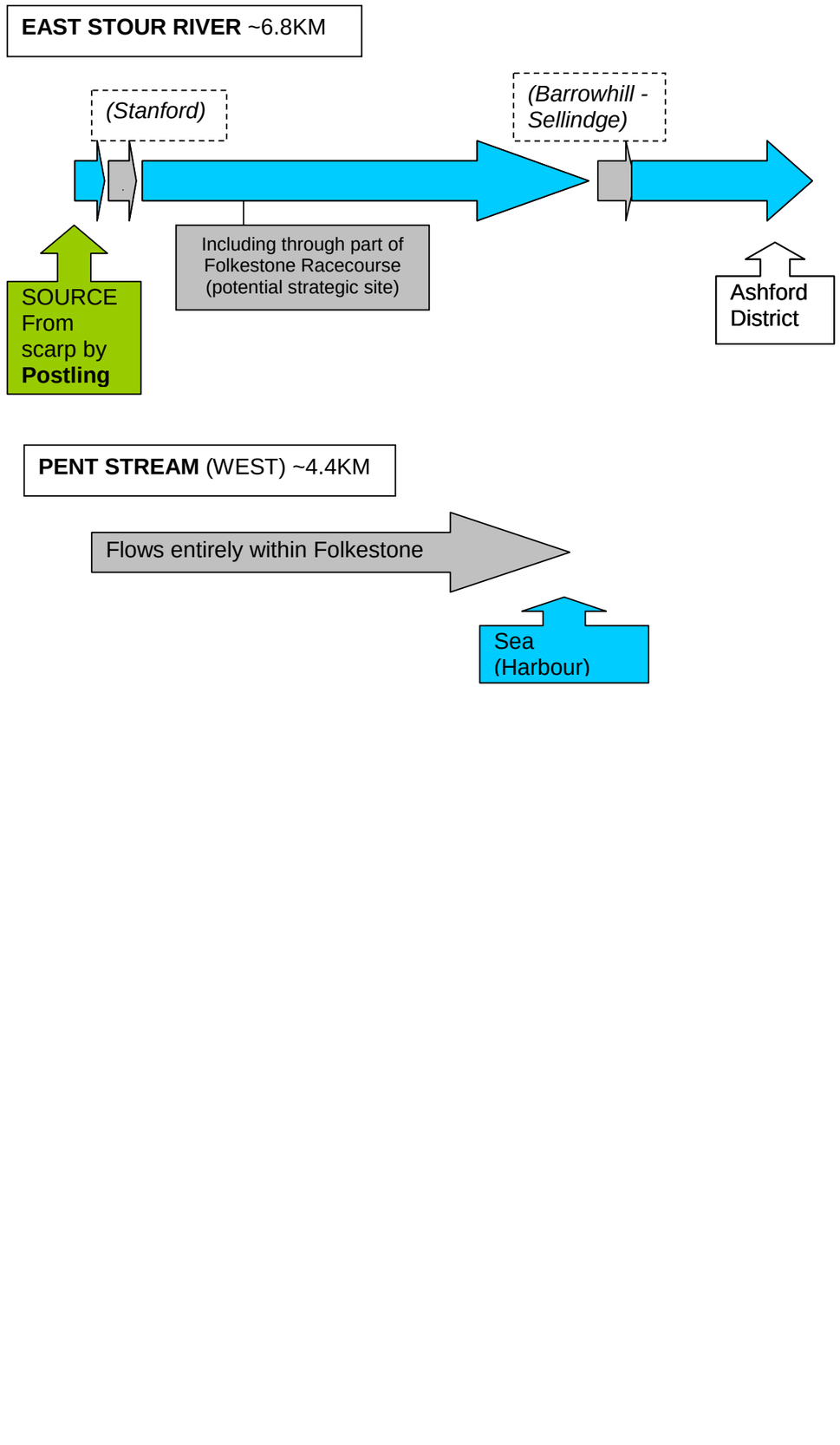
NEW SEWER ~16KM



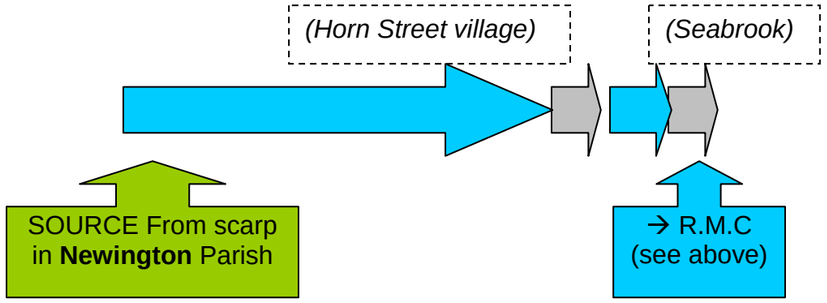
Annotated explanation of diagrams.
Features shown on this example include:

- *Settlements past through (grey sections)*
- *Urban sections (within/on Local Plan settlement boundary): shown blue. To approximate scale.*
- *Origin and outflow points. Natural source in Shepway shown green, outfall to sea in Shepway shown blue, and flow to/from land elsewhere (crosses Shepway boundary) shown clear.*

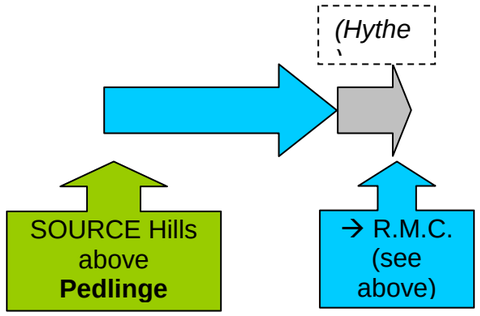
This linear depiction of the Nail bourne therefore shows it is one of the longer watercourses in Shepway, that it has two main urban and two main rural sections (flowing through Lyminge and Elham but mostly through open countryside), and that it originates near Etchinghill and flows on into Canterbury's+ area.


EAST STOUR RIVER ~6.8KM
(Stanford)
(Barrowhill - Sellindge)
Including through part of Folkestone Racecourse (potential strategic site)
SOURCE From scarp by Postling
Ashford District
PENT STREAM (WEST) ~4.4KM
Flows entirely within Folkestone
Sea (Harbour)

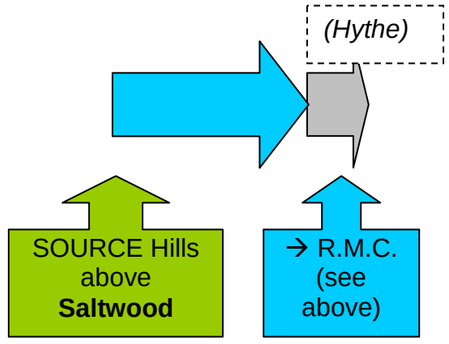
SEABROOK STREAM ~4.3KM



BROCKHILL STREAM ~2.5 KM



MILL LEESE ~2.1KM



APPENDIX 3 South East Plan Policy

South East Plan Policy	Policy Content
Cross Cutting Policies	
Policy CC1: Sustainable Development	Promotes sustainable development, the sustainable use of resources, protecting the physical and natural environment of the South East Region and safeguarding against climate change
Policy CC2: Climate Change	This examines the suitable location of development away from risk and more sustainable building techniques and measures.
Policy CC3: Resource Use	Focuses on the efficiency of new development, the adaptation of existing development and encouraging change of behaviour in organisations and individuals
Policy CC4: Sustainable Design and Construction	Promotes the use of sustainable construction standards and techniques in all new development, and the redevelopment and refurbishment of existing building stock.
Policy CC7: Infrastructure and Implementation	Promotes proper regard for the capacity of existing infrastructure and secures the programmed delivery of additional infrastructure where it is required.
Policy CC8: Green Infrastructure	This policy provides a considered approach to Green Infrastructure, its planning and delivery and its resilience against climate change.
Housing Policy	
Policy H2: Managing the Delivery of the Regional Housing Provision	Reinforces an appreciation of due regard to environmental and infrastructure issues.
Policy H5: Housing Design and Density	This encourages positive measures to reduce the environmental impact of new housing through sustainable construction methods and good use of available land.
Natural Resource Management	
Policy NRM1: Sustainable water resources and groundwater quality	Promotes the avoidance of detrimental effects on natural systems and favours the twin track approach of demand management and water resource development; therefore ensuring local planning authorities have a responsibility for protecting water resources; promotes water efficiency and good environmental practice in relation to new development.
Policy NRM2: Water Quality	This will be maintained and enhanced through avoiding adverse effects of development on the water environment within the plan making process and through cooperation with the relevant key stakeholders
Policy NRM3: Strategic Water Resources Development	There is a demonstrable need for new water resource schemes to ensure that future supply can meet demand. The policy recommends that local authorities liaise with the EA and relevant water companies to safeguard the environment and consider what is required for future supplies.
Policy NMR4: Sustainable Flood Risk Management	This reiterates the objectives of Planning Policy Statement 25 at the regional level, promoting a sequential approach to development and the production of a strategic flood risk assessment. Encourages closer working between the local planning authority and the EA over a number of areas; including management plans, biodiversity, the impact of surface runoff and waste water.
Policy NMR5: Conservation and Improvement of Biodiversity	Guards against the loss of biodiversity and actively encourages improvements that will help to achieve a net gain. Most significant are the internationally recognised sites, including those subject to the Habitats Directive. It is the local planning authority's responsibility that its plans do not create any adverse impacts on such areas in its plan making process. This policy also favours the development of Green Infrastructure.
Policy NMR8: Coastal Management	Provides an integrated approach to the management and planning of coastal areas. Appropriate social, economic and environmental objectives should be taken into account in relevant plans. The dynamic nature and character of the coast should be managed through enhanced collaboration between organisations and across administrative boundaries. [43]

[43]Government Office for the South East (2009) Extract from The South East Plan, The Region's Key Environmental Challenges, Government Office for the South East, Accessed on line, Date accessed 16.03.10, Web site address: http://www.gos.gov.uk/gose/planning/regionalPlanning/815640/

APPENDIX 4 Water resources: examination of the WRMP assumptions

The growth in population within the district that is likely to occur over the lifetime of the LDF CoreStrategy is a key aspect of the water demand calculation used by Veolia Water SE in the development of the WRMP.

The underlying population change assumptions used in the WRMP to help derive predicted demand have been thoroughly scrutinised through comparison with data available to the district council. This is a robust approach as VWSE's area aligns well with administration boundaries within districts, and therefore demographic information published at ward/parish level can be closely matched and aggregated up to meet VWSE's boundary.

The focus of this analysis is on population levels (rather than, for example, number of households) as the WRMP states this is the primary determinant. The WRMP draws from modelling commissioned by Experian and sets out a range of total population scenarios for 2001 to 2040 (see p.41 of the document). It shows that the majority of VWSE's current population is accounted for by Shepway residents[44.] See Shepway's Annual Monitoring Report (2010) for up-to-date local population projections.

Guidelines for producing the WRMP recommend use of a policy-based approach and the district council concurs with this general philosophy as the most appropriate in its experience. VWSE's projections include a trend scenario. However, Shepway District Council is aware that extrapolating forward recent population trends (unless on a long term basis) produces very large increases in population at a rate that has not occurred in the past and, moreover, to a 2026 level which cannot be accommodated under any likely scenario[45]. (Structural influences, for example, economic or demographic change, mean it is rarely robust to rely on an extrapolation for a long time forward, based on a relatively short period).

Examination of population projections for the local policy scenarios most likely (as set out district LDFs), shows:
The WRMP policy growth scenario to be generally realistic, at least as far as the period to 2026 is concerned[46.]
The WRMP total population starting point (2001) is appropriate and not an over-estimate.

In terms of the period 2001-2007, analysis for this report suggests that the growth mapped out in the WRMP (see figure 3 of the document) is potentially slightly higher than is now believed to have occurred: at 4% compared to the KCC sub-district information suggesting a population increase for the relevant area of half that rate.

[44] On this basis, VWSE covers all of Shepway apart from areas served by South East Water: Elmsted and Stelling Minnis to the north, Brenzett, Brookland, Ivychurch, Newhcurch, Old Romney, and Snargate parishes of Romney Marsh). It also covers the south of Dover District: 'Dover Urban Area' as defined by KCC (9 wards) plus around half a dozen other parishes. The couple of small parishes in Canterbury's area are sparsely populated and considered de minimis in growth terms.
[45] The WRMP trend total proportionate increase in population 2006-2026 is comfortably in excess of the 14% increase in the same period calculated by Kent County Council for the maximum likely housing growth scenario (developing all SHLAA sites) for Shepway.
[46] Limited growth under an 8,000 dwelling completion level in Shepway 2006 to 2026, is increased by Dover's ambitious growth plans in their Adopted 2010 LDF Core Strategy (the main growth point of Whitfield falling within VWSE's area unlike the north of their district)

The results of this exercise were satisfactory in terms of accommodating growth into the 2030s, and the fundamental issue of whether sufficient drinking water reserves were available during the lifetime of the WRMP. Following on from this are practical issues such as the local water infrastructure. In consultation on the council's potential Strategic sites with Veolia Water SE, the company's initial response is presented in Appendix 5, Water Supply for Strategic Sites.

In addition, Table 5 shows initial comments from Southern Water, who raised concerns regarding the connection of potential strategic sites to the existing waste water infrastructure network and provides comments on flooding in relation to the sites taken from the council's Strategic Flood Risk Assessment

APPENDIX 5 Potential Strategic Sites

Location	Current Estimate of number of new homes	VWSE Comments	Initial SW Comments	Strategic Flood Risk Assessment Hazard Rating existing	Strategic Flood Risk Assessment Hazard Rating with climate change
Folkestone Seafront	800-1000	Provisional analysis suggests there is sufficient capacity in the system but with a development of this size some offsite works are likely to be required once more detail are available.	Issues regarding infrastructure capacity Initial comments from SW underpin the need to provide a connection to the sewerage network at the nearest point of adequate capacity. Further technical work will be required. (In April 2011 the Shorncliffe Garrison Masterplan was published. This contains a Utilities Strategy that details progress that has been made regarding waste water strategic infrastructure improvements. Initial comments from Southern Water indicate a preference for a new sewer connecting the barracks site to the waste water treatment works at Hythe).	Adjacent to an overflow boundary	Adjacent to an overflow boundary, pockets of low and medium risk
Risborough and Napier Barracks, Cheriton	900-1200	There are a number of issues with this site: the MoD are responsible for supply and operate a storage tank and booster pumps. If MoD seek to transfer their current water supply responsibility to VWSE (which based on previous experience is considered likely), this will need detailed assessment, but is likely to involve local reinforcement. Further local reinforcement to meet development demand will depend on the exact location of the development as there are high points which will be difficult to supply.		N/A	N/A
New Romney	200-500	Difficult to assess but could be a problem depending on location. Spare capacity / pressure in general area not good. Needs further investigation to define extent of local reinforcement.	Southern Water stated that provision for Wastewater was ok and that foul sewer capacity was available. In their formal response, Southern Water expressed standard concerns and proposed the council supporting developer connection at the nearest point of adequate capacity	Marginally affected by low hazard rating	Mix of risk zones, some areas free, of risk, rest of site generally medium with pockets of low and high risk
Westenhanger (Folkestone Racecourse)	400-900	No significant issues; some off site connection work required, but not	SW recognise the issues relating to waste water treatment within the	There is some risk of flooding associated with local water course.	This is not shown to be affected by climate change. Areas subject to flooding can be

		significant.	Westenhanger/Sellindge area and submitted investment proposals to Ofwat as part of their periodic review (2010-2015). Improvements were aimed at treating effluent discharge and additional works to accommodate growth. Although Ofwat did not grant funding the council is working with SW and the developers of Westenhanger to ensure qdequate capacity		incorporated into the landscape for the site.
Sellindge	100-250	Existing mains infrastructure lacks capacity - local reinforcement is considered likely.		N/A	N/A
Hawkinge	100-300	Existing mains infrastructure lacks capacity - local reinforcement is considered likely.	Southern Water expressed concerns about the capacity of the local sewerage system and proposed the council supporting developer connection at the nearest point of adequate capacity. The whole of the PO site was not included in the Feb 2009 comments, areas that were covered were deemed to have no capacity, further improvements would be required downstream.	N/A	N/A
Lympne	50-100	No significant issues; some off site connection work required, but not significant.	Issues regarding infrastructure capacity	N/A	N/A

The Nicholls Quarry site is an inherited allocation in the context of the LDF. It has gained outline planning permission, and masterplanning of the site has been used to addressing flood issues.

There are also some flood issues in respect of New Romney, especially when climate change is factored in. However, using the Strategic Flood Risk Assessment, it is possible to demonstrate that the site is at considerably less risk of flooding than much of the surrounding area. The council will seek to ensure that any masterplan for the site acknowledges this issue and that effective measures to mitigate against this risk are part of the design solution for the site.

APPENDIX 6 The Pitt Review

In June and July 2007 severe floods hit many parts of the country, which tested the resilience of infrastructure and the efficiency of emergency response procedures. As a result ministers asked Sir Michael Pitt to write an independent review, an assessment of what had happened and what could be done to minimise the impact of such events.

The Pitt Review identifies six key areas where improvements to mitigation measures against flooding could be made:

- Knowing where and when it will flood
- Improving planning and reducing the risk of flooding and its impact
- Being rescued and cared for in an emergency
- Maintaining power and water supplies and protecting essential services
- Better advice and helping people to protect their families and homes
- Staying healthy and speeding up recovery

The Pitt Review contains 97 recommendations, which can be divided between prevention measures and response measures. Planning policy can be most effective in terms of flood prevention through the development of policy that supports sustainable development in suitable locations[47]

[47] Cabinet Office (2008) The Pitt Review: Lessons learned from the 2007 Floods, Cabinet Office, Accessed on line, Date Accessed 20.09.10, Web site address: http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html

Appendix 7 Protocol for evaluation of potential strategic sites for development against water related requirements

In terms of the LDF Core Strategy these generic aspirations can be developed by aligning policy with the capacity of existing water infrastructure and water related issues, with assistance from service providers. Factors raised in this report warrant ongoing consideration, and the council and statutory agencies will continue to discuss the issues that the report has raised in conjunction with other key partners.

Early consultation between the district council, the utility companies and the Environment Agency provides an opportunity to discuss water related aspects of a site in relation to a development scenario to provide a comprehensive assessment of the relevant issues.

As has been shown within the Water Cycle Report there are a variety of water related factors that need to be considered in the future long term planning for the district, these are:

- water availability and whether there are sufficient reserves for the housing growth proposed within the Core Strategy
- flood risk
- waste water treatment capacity
- nature conservation

In order for a development to be realised it will proceed through a number of design stages, which should refine ideas and solve problems to provide the most appropriate design solution for a site.

Site Evaluation

A considered and informed approach to the design process is intrinsic to the delivery of successful development. Through the examination of a potential site in the context of its environs strengths and weaknesses can be identified. The basic stages of the design process and how the council can use it to successfully engage with developers and service providers is outlined below.

Preliminary Engagement

- Initial discussions between local authority, the Environment Agency and utility company regarding:
    - site proposals
    - the implications of location
    - existing infrastructure

Initial design concepts

- Consideration of issues and demonstration, to the satisfaction of the council and its partners that effective deliverable measures are possible to facilitate successful development.

- Initial plans and evidence of work undertaken by a developer, which has been sanctioned by the relevant utility provider demonstrating how a strategic site will be serviced without any detrimental affects on the surrounding environment. Where appropriate showing options for the location and viability of elements of strategic infrastructure

- The council, in conjunction with its partners will evaluate of any proposals for their suitability and stipulate requirements for the realisation of a design solution.

Detailed Design

- The provision of detailed design solutions that are acceptable to the council and service providers. These will need to show a final agreed design solution supported by evidence on how it will be delivered, including phasing where this is applicable.

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Sustainable drainage systems. Hydraulic, structural and water quality advice (C609)

"A sustainable drainage system aims to mimic as closely as possible the natural drainage of a site to minimise the impact of urban development on the flooding and pollution of waterways.
This technical report summarises current knowledge on the best approaches to design and construction of sustainable drainage systems. Readers of this book will improve their understanding of the hydrological, hydraulic, structural, water quality and ecological aspects of the various SUDS features available in the UK and overseas."

The SUDS manual (C697)
"This guidance provides best practice guidance on the planning, design, construction, operation and maintenance of Sustainable Drainage Systems (SUDS) to facilitate their effective implementation within developments.
The guidance supersedes previous general guidance on SUDS and addresses landscaping, biodiversity issues, public perception and community integration as well as water quality treatment and sustainable flood risk management. A separate site handbook (C698) Site handbook for the construction of SUDS on the construction of SUDS has also been produced."
Groundwater Protection Best Practice
Relevant Information produced by the Environment Agency is available @

http://www.environment-agency.gov.uk/research/planning/121619.aspx

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