

Topic Paper 5 - Water

Introduction

- 1 This topic paper covers a series of issues relating to water in Dorset, including
 - surface water (rivers and inland water bodies);
 - coastal water;
 - groundwater;
 - water consumption and;
 - flooding (including Strategic Flood Risk Assessment).

Surface Water

2 Rivers, lakes and coastal waters are vital natural resources, providing drinking water, crucial habitats for many different types of wildlife, and are an important resource for industry and recreation. The baseline information for surface water in Dorset is discussed below. As protecting and improving the water environment is an important part of achieving sustainable development, the regulatory context for achieving this is initially summarised.

Water Framework Directive

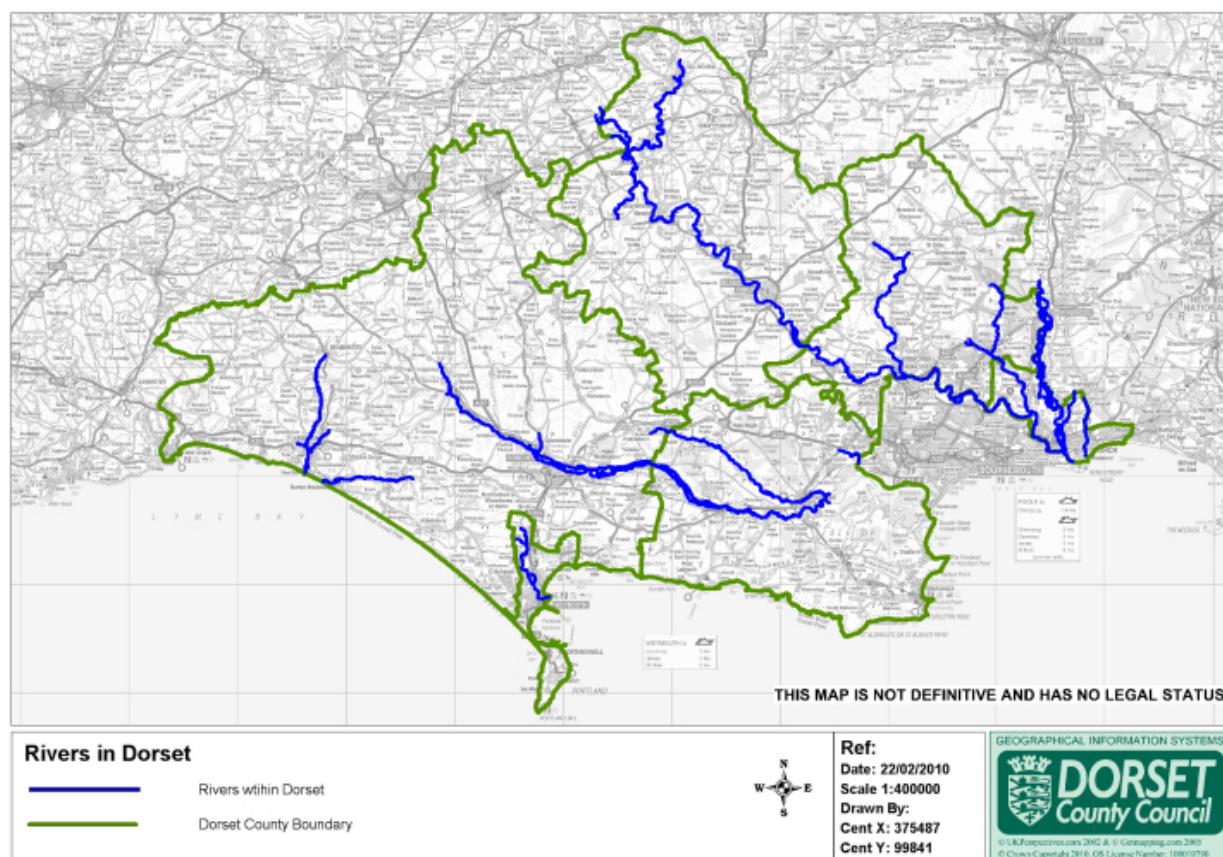
3 The EC Water Framework Directive, which came into force in December 2000, established a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. Its purpose is to ensure that all aquatic ecosystems, with regard to their water needs, terrestrial ecosystems and wetlands, meet 'good status' by 2015.

4 The Directive requires Member States to establish river basin districts and, for each of these, a river basin management plan. The South West River Basin Management Plan Water identifies actions to improve the water environment. This includes actions related to the minerals industry, since water quality can be undermined by the silting of watercourses from mining and quarrying operations, by workings below the water table and by discharges of mine water. Other actions set out in the management plan which may be relevant to minerals and waste planning, include actions on transport, development planning and industry (including pollution and emissions).

Baseline Information

5 There are a number of rivers within the county, illustrated on Figure 1. The sub-region is also home to Poole Harbour, a transitional water body. Minerals and waste developments must be considered in the context of surface water and implications relating to water quality and flooding. Many of the surface water bodies are also important ecologically.

Figure 1 Dorset's Rivers



6 The Water Framework Directive enables the Environment Agency to assess the whole water environment in a comprehensive way so that action can be directed to where it is most needed. For surface waters there are two separate classifications for water bodies, ecological and chemical. For a water body to be in overall 'good' status both ecological and chemical status must be at least 'good'. For groundwater there are two separate classifications for groundwater bodies; chemical status and quantitative status. Each must be reported in addition to the overall groundwater body status. For a groundwater body to be at good status overall both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status.

7 In the South West River Basin District 33% of surface waters meet good status or better; 67% per cent do not meet good status. For groundwaters, 84% of waterbodies are at good quantitative status, and 64% at good chemical status.

8 The following river catchments are within or partly within Dorset. A description of each catchment is given below.

- Frome and Piddle
- Dorset Stour
- West Dorset Streams
- East Devon
- Parrett

- Hampshire Avon

9 For each of these catchments (with the exception of East Devon, for which there is no Catchment Abstraction Management Strategy) the Environment Agency have produced a Catchment Flood Management Plan (CFMP) and a Catchment Abstraction Management Strategy (CAMS).

10 The CAMSs are strategies for management of water resources at a local level. They make more information on water resources and licensing practise publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties. CAMS are also the mechanism for managing time-limited licences (licences that have a fixed expiry date) by determining whether they should be renewed and, if so, on what terms ⁽¹⁾.

11 The Catchment Flood Management Plans (CFMP) assess inland flood risk, considering all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea (coastal flooding), which is covered by Shoreline Management Plans (SMPs). CFMPs will establish flood risk management policies which will deliver sustainable flood risk management for the long term ⁽²⁾.

Frome and Piddle

12 For the Frome and the Piddle, the overall catchment area is about 900 square kilometres, and has a population of around 170,000. Except for the urban conglomeration of Poole, it is a rural catchment, with urban areas making up only two per cent of the total. The other main urban areas include Dorchester, Wareham and Swanage.

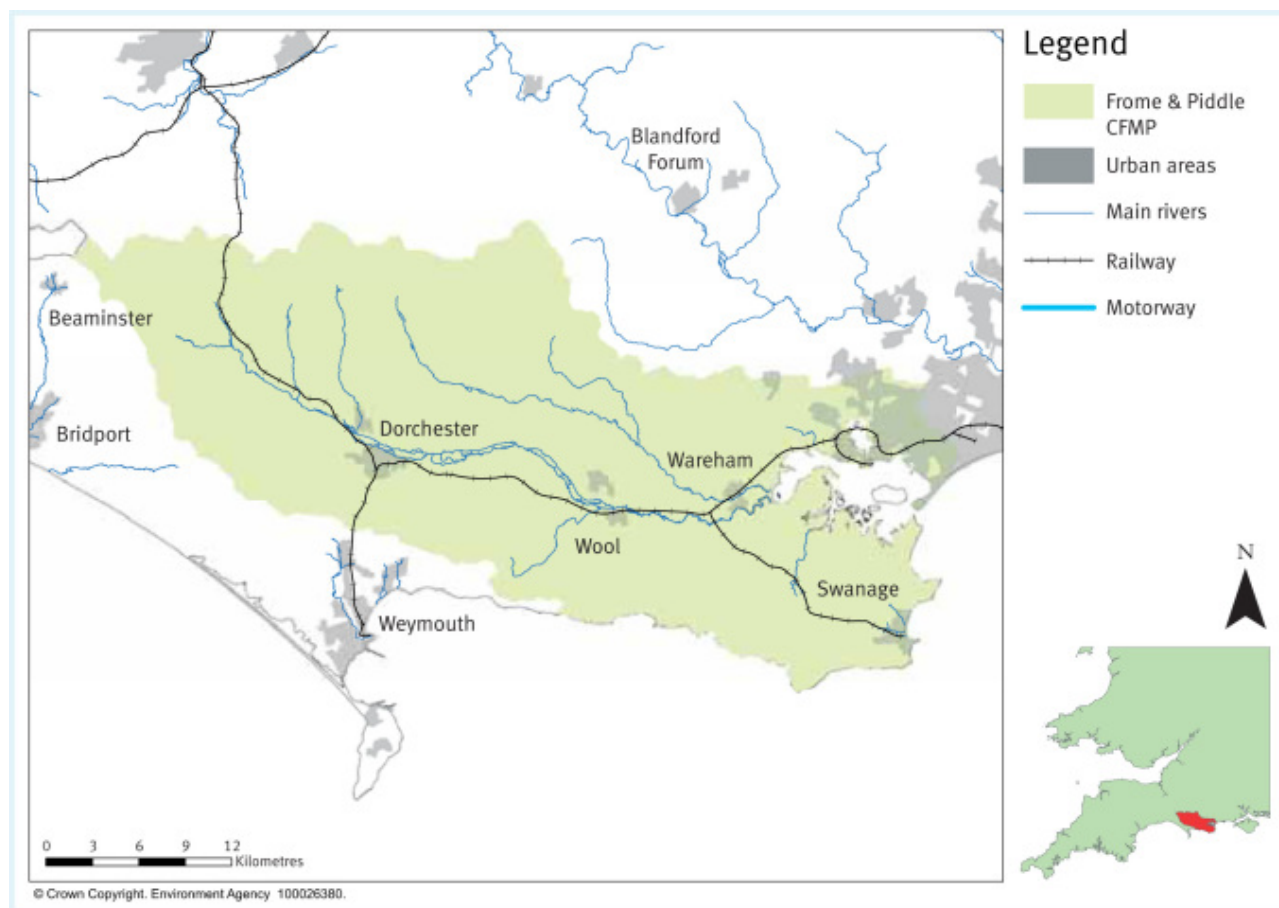
13 The Frome and Piddle catchment is characterised in the upper reaches of the North Dorset Downs by open chalk downland with steep scarp slopes, sheltered valleys, chalk hills, ridges and limestone plateaux, leading to flat-bottomed open valleys with clay and alluvial deposits at the lower end. The rivers Frome and Piddle discharge into Poole Harbour at sea level just downstream of Wareham. The steep slopes at the top of the catchment lead to fast runoff responses to rainfall events. As gradients slacken and valleys broaden through the catchment, there is a more gradual response to run-off.

14 The upper area of the catchment is underlain by chalk geology up to 300m thick, which readily absorbs rainfall and transmits it to the groundwater supplies, which in turn support spring and river flows. This chalk aquifer is used for public water supply. The middle and lower areas of the catchment are overlain by up to 100m of mixed geology including clays that, in contrast to the chalk, do not readily absorb water allowing it to remain on the surface before discharging into the rivers. There are large low-lying wetland areas, the site of important habitats, around Poole Harbour ⁽³⁾.

1 Dorset Stour Catchment Abstraction Management Plan 2004: Environment Agency

2 Dorset Stour Catchment Flood Management Plan - Environment Agency: 2009

3 Frome and Piddle Catchment Flood Management Plan - Environment Agency

Figure 2 Frome and Piddle Catchment Area

Source: Frome and Piddle Catchment Flood Management Plan

Dorset Stour

15 The Dorset Stour catchment extends from the headwaters of the River Stour at Stourhead flowing south east through Gillingham and Blandford Forum to Christchurch Harbour where it enters the English Channel.

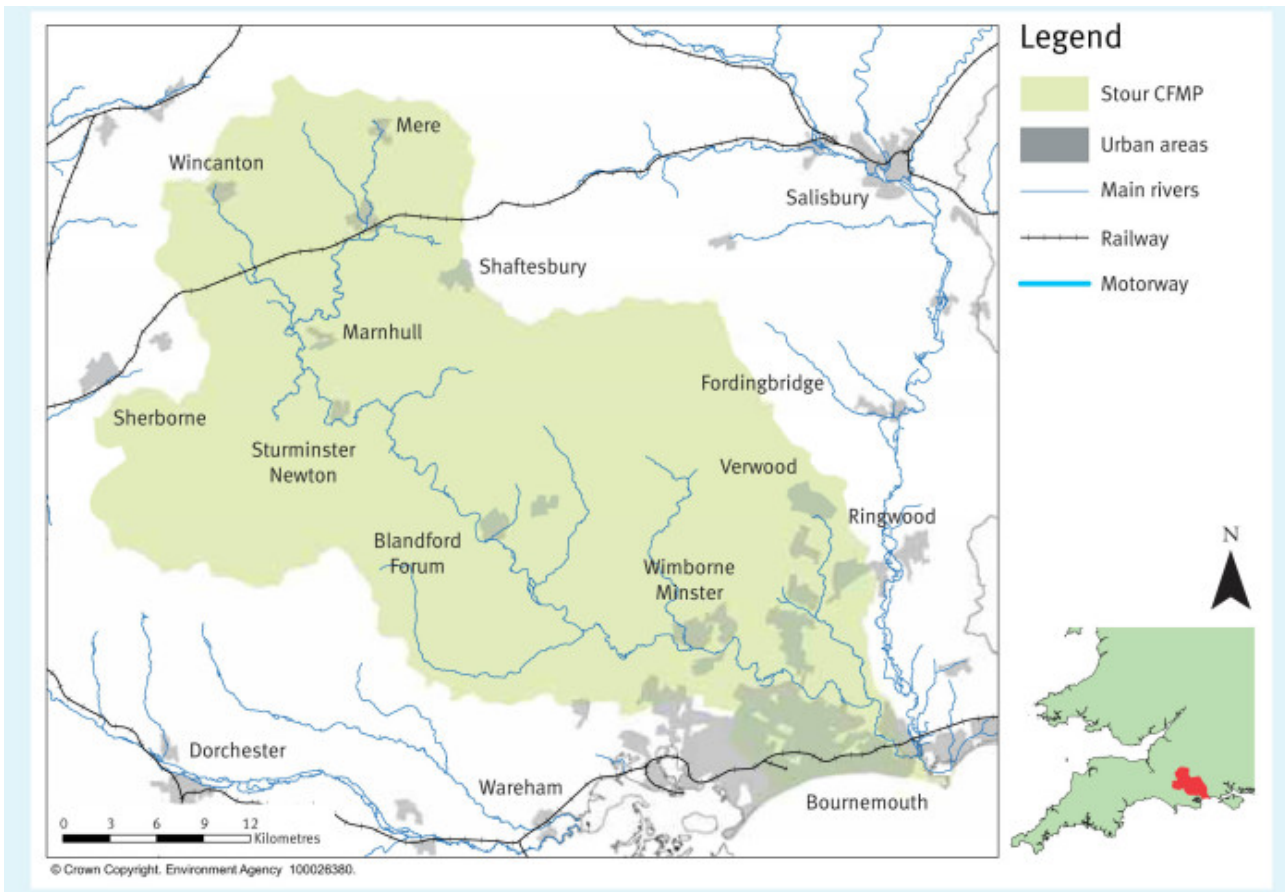
16 The overall catchment area is about 1,240 square kilometres, and has a population of around 400,000. Almost three quarters of these people live in the Bournemouth, Poole and Christchurch conglomeration in the south of the catchment. Away from this urban conglomeration the catchment is largely rural.

17 The landscape of the Dorset Stour catchment varies considerably with the varying geology along the Stour's course. This influences both the river's characteristics and the causes of flood risk across the catchment. The upper catchment consists of impermeable clays of the Blackmore Vale resulting in shallow valleys with wide floodplains. The central band of permeable chalk on Cranborne Chase results in steeper valleys and narrow floodplains. The lower catchment has the semi-permeable sands, clays and gravels of the Dorset Heaths.

18 Run-off and changes in water levels are rapid in the many streams on the clays. Water levels rise more slowly in the rivers across the chalk, the rivers being fed by groundwater. Within the River Stour catchment there are a number of sites designated for their environmental importance including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites. Important

environmental sites in the catchment include Dorset Heaths (Ramsar, Site of Special Scientific Interest (SSSI), SPA and Environmentally Sensitive Area) and The Cranborne Chase and Wiltshire Downs Area of Outstanding Natural Beauty (AONB) ⁽⁴⁾.

Figure 3 Dorset Stour Catchment Area



Source: Dorset Stour Catchment Flood Management Plan

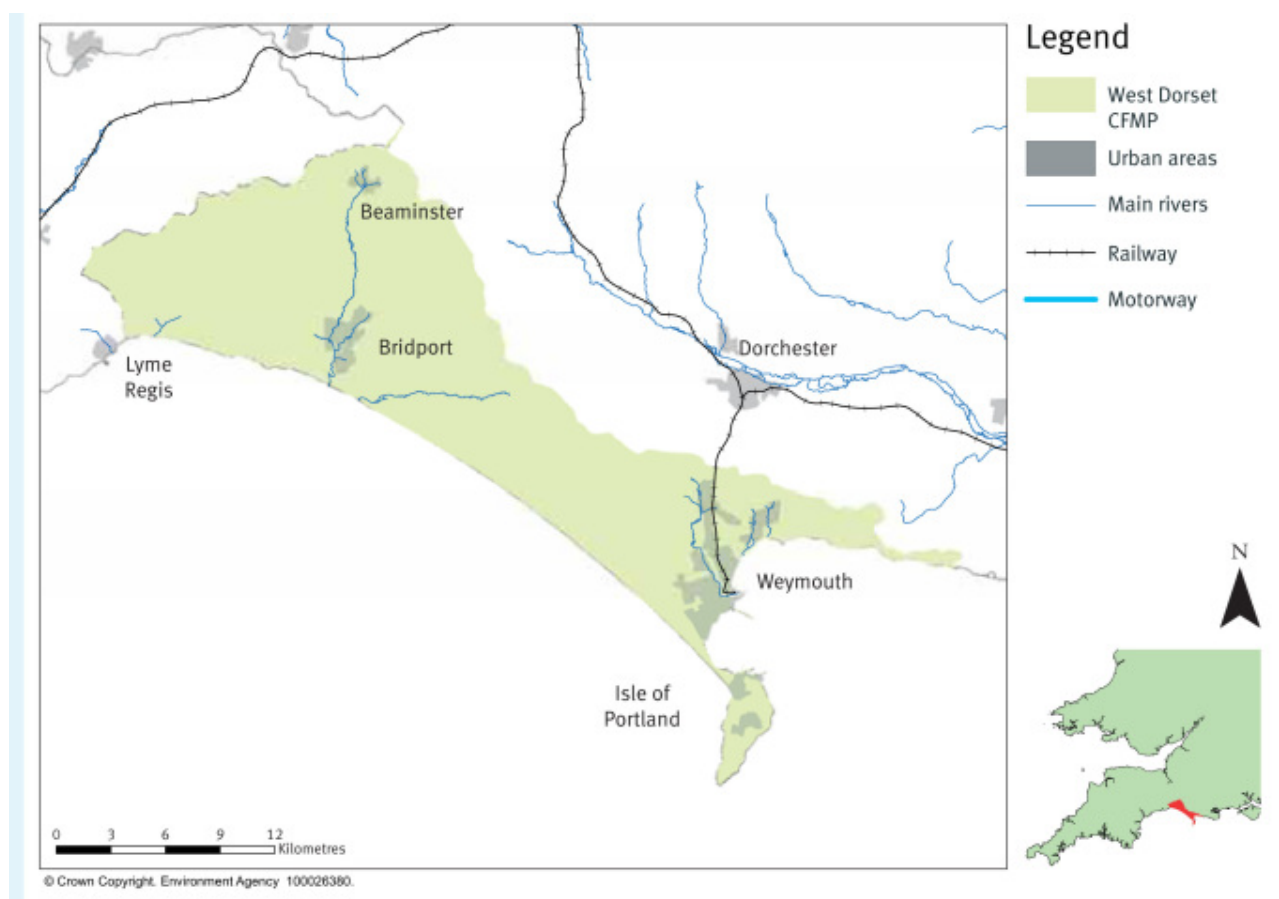
West Dorset Streams

19 The river catchments covering West Dorset are (from west to east) the Char, Brit, Bride and Wey, each flowing directly into the sea on the south coast. All of these catchments are small with a total river length of between 10km and 20km and catchment areas of 50km² to 115km². The River Char and River Brit have a very rapid response to rainfall. The River Bride and River Wey are fed by chalk aquifers which tend to dampen the response unless heavy rainfall occurs following a period of prolonged wet weather.

20 The geology of the West Dorset area is highly distinctive and has had a profound influence on the landscape, hydrology and land use within the catchment. In general, the geology becomes progressively younger from west to east. Lower Jurassic sandstones and clays in the west give way to Middle Jurassic clays and limestones further to the east. Overlying the Jurassic strata to the west

and north east are outcrops of Cretaceous Greensand and remnants of the overlying Chalk. These are major aquifers providing baseflow to the River Bride and River Wey during the summer months (5).

Figure 4 West Dorset Catchment Area



Source: West Dorset Catchment Flood Management Plan

East Devon

21 The river catchments that make up the East Devon CFMP are (from west to east) the Otter, Sid, Axe and Lim, each flowing directly into the sea. The Otter and Axe are the larger of these catchments. The Otter rises at 300m Above Ordnance Datum (AOD) in the Blackdown Hills, while to the east, the Axe rises at a lower altitude of 175m AOD in the Yeovil Scarplands. Both of these rivers have steeply sloping tributaries. The Sid and Lim are much smaller catchments with steep channel gradients from their source to the sea. The East Devon CFMP covers an area of some 750 square kilometres (300 square miles). Annual rainfall ranges from more than 1,000mm (40in) in the Blackdown Hills to less than 800mm (32in) on the coast.

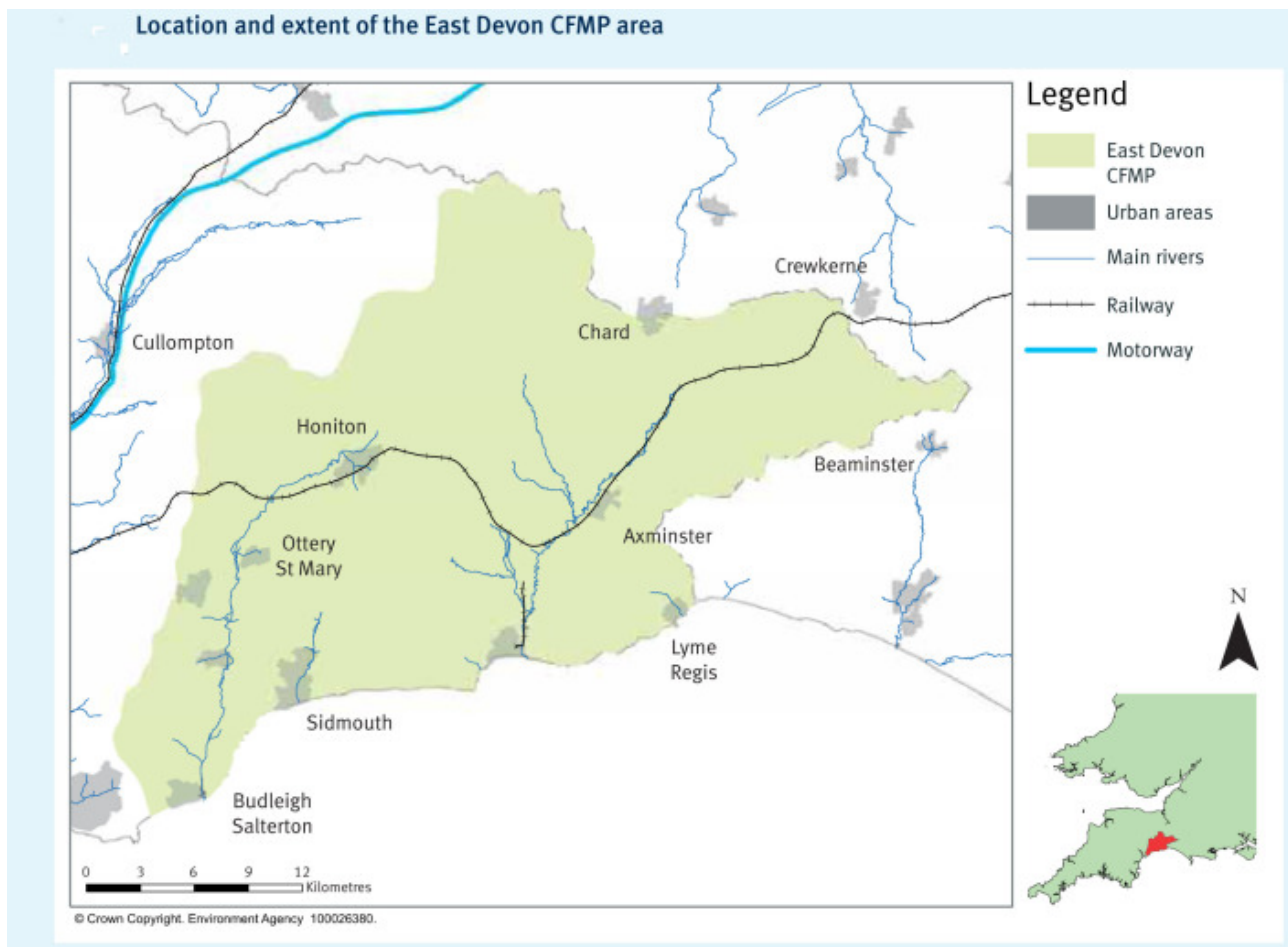
22 The geology tends to become progressively younger from west to east. Older Permian, Triassic and Jurassic layers are covered by younger Cretaceous layers are still present, forming plateaux at higher elevations, particularly in the Axe and Lim catchments. The Permo-Triassic mudstones,

sandstones and pebble beds lying beneath the Otter and Sid Catchments lead to significant surface run-off. The rivers respond rapidly to rainfall, and floods are characterised by a very rapid rise and fall in water levels, with high flood peaks.

23 Beneath the Axe and Lim catchments there are Triassic and Jurassic calcareous clays and mudstones, and Cretaceous greensand and chalk. These rivers generally respond to rainfall, though they respond slower than the other East Devon rivers. The flood peaks of the River Axe reduce as they reach wide floodplain, but the river is often slow to recede in its lower reaches. The greensand is important in storing and slowly releasing groundwater into the tributaries of the Axe, maintaining flow through dry periods.

24 The catchment is known for its valuable visual landscape and includes parts of the Blackdown Hills, East Devon and Dorset Areas of Outstanding Natural Beauty (AONBs). There are also four Special Areas of Conservation (SAC), one Special Protection Area (SPA), 29 Sites of Special Scientific Interest (SSSI), and 118 Scheduled Monuments. Urban development is mainly concentrated in towns on the coast, notably Budleigh Salterton, Sidmouth, Seaton and Lyme Regis. Inland, with the exception of Honiton, Axminster and Ottery St Mary, the majority of land use is agricultural ⁽⁶⁾.

Figure 5 East Devon Catchment Area



Source: East Devon Catchment Flood Management Plan

Parrett

25 The catchment of the River Parrett is located in the south west of England. It drains from the Quantocks, Blackdown Hills and Mendips, flowing through the low-lying Somerset Levels and Moors to the Bristol Channel at Bridgwater Bay. Figure 6 shows the location and extent of the River Parrett CFMP area. It includes the tributaries of the rivers Isle, Tone, Yeo and Cary. Below Bridgwater, the downstream limit of the CFMP area overlaps with the upstream boundary of the North Devon and Somerset Shoreline Management Plan (SMP) boundary. The North Devon and Somerset SMP deals with coastal flood management, while the CFMP considers tidal flood risk along the Rivers Parrett and Tone to the tidal limits at Oath and Newbridge respectively.

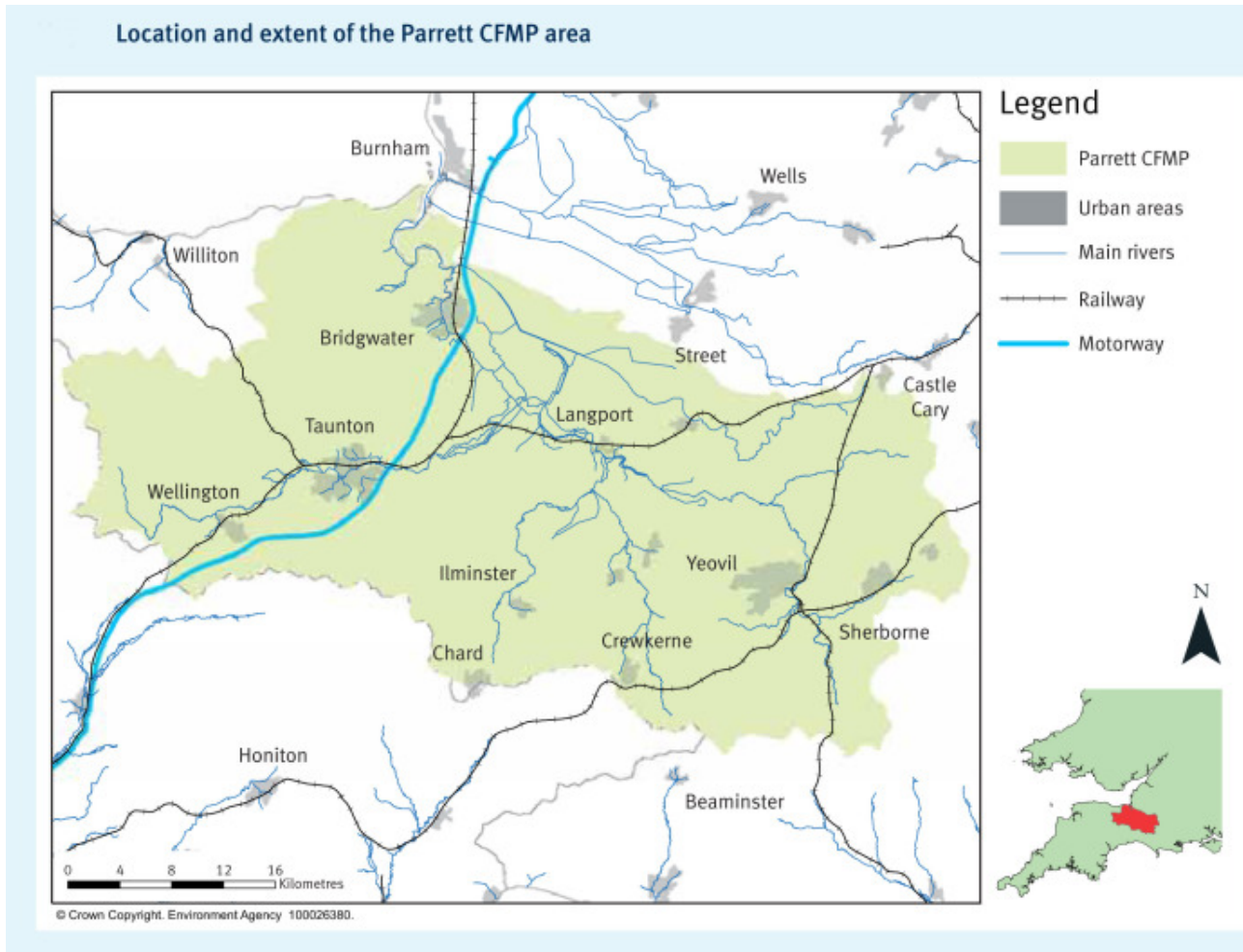
26 The overall catchment area is about 1,700 square kilometres, and has a population of around 300,000. It's a rural catchment, with urban areas making up only four per cent of the total. Its main urban areas include Taunton, Bridgwater and Yeovil. The rivers and streams flow from their source in the hills in the southwest and east of the Catchment overview catchment. They flow in a north and westerly direction down into an extensive lowland floodplain, before flowing out into the Bristol Channel through the Parrett Estuary. The major rivers start in the steep uplands, then flow through flat lower moors, where they are embanked and in some places perched above the surrounding floodplain. The lower reaches of the rivers Tone and Parrett are tidal for some 30km (18.6miles) from the Severn Estuary.

27 The steepness of the uplands, coupled with the geology and soil conditions, generates quick run-off from short intense rainfall. In the Somerset Levels and Moors, flooding is caused by longer duration storms or a series of storms of low intensity. The high-level embanked channels overflow and floodwater is stored in the moors before it can reach the estuary. The capacity of these channels can be significantly reduced by high tidal conditions backing up the Parrett.

28 The underlying rock has a significant influence on the catchment's response to rainfall, with high run-off from the impermeable uplands in the east and waterlogging of the lowlands. The area does not have any major aquifers so groundwater flooding is not a major risk.

29 The catchment contains a number of designated sites of national and international importance. A significant part of the low-lying Somerset Moors are designated Special Protection Areas and a Ramsar site, which depend upon flooding. ⁽⁷⁾.

Figure 6 Parrett Catchment Area



Source: Parrett Catchment Flood Management Plan

Hampshire Avon

30 The east and west branches of the Hampshire Avon rise in the Vale of Pewsey to the north of Salisbury. The watercourses here receive significant flows from the chalk aquifers underlying Salisbury Plain, and then continue to flow in a southerly direction. At Salisbury, the Avon is joined by two of its major tributaries – the River Bourne and the River Nadder (including the River Wylfe), and a short distance downstream by the River Ebble. The Avon then continues through the towns of Downton, Fordingbridge and Ringwood, draining south across a wide flood plain also fed by the New Forest streams, towards Christchurch Harbour and Christchurch Bay on the south coast.

- Area: 1,750 square kilometres (690 square miles).
- Population: 230,000.
- Annual rainfall: Varies from 833 millimetres (33 inches) on the coast to more than 1,000mm (40in) over the upper reaches. This compares to the average for England and Wales of 920mm (36in).

- Land use: The catchment is predominantly rural (98 per cent), with much of the area consisting of pasture and arable land, woodland and plantations and heathland.

31 Environmental designations: Parts of the catchment lie within the Cranbourne Chase and West Wiltshire Downs Area of Outstanding Natural Beauty (AONB) and the North Wessex Downs AONB. Parts also lie within the South Wessex Downs Environmentally Sensitive Area (ESA) and Avon Valley ESA. There are nine Special Areas of Conservation (SAC); 71 Sites of Special Scientific Interest (SSSI); six National Nature Reserves (NNR); part of the New Forest National Park; and the World Heritage Site of Stonehenge.

32 Geology: The upper Avon catchment is typified by the undulating, chalk downlands of Salisbury Plain, which are cut by steep coombes and river valleys. The lower catchment is characterised by rolling farmland and the New Forest. The main watercourses have wide floodplains and flow through farmland, woodland, scrub and open heathland.

33 Topography: The Hampshire Avon catchment is characterised by open chalk downland with steep scarp slopes, sheltered valleys, chalk hills, ridges and limestone plateaux. These significant variations in the topography have a strong influence on the rivers' response to rainfall ⁽⁸⁾

Figure 7 Hampshire Avon Catchment Area



Source: Hampshire Avon Catchment Area Management Strategy

Poole Harbour

34 Poole Harbour is a large natural harbour of approximately 36 km². It is designated a 'transitional water body' and 'protected area' under the Water Framework Directive. Its intertidal habitats and coastal waters are of international nature conservation importance (see Topic Paper 4 - Biodiversity and Geodiversity).

35 The condition status of Poole Harbour protected habitats is subject to the provisions of the Habitats Directive and Water Framework Directive (WFD), both of which aim at maintaining or, where appropriate, restoring the condition of the protected habitats.

36 Since the mid 1980's, the harbour has experienced a significant expansion of macroalgal mats fuelled by rising levels of nitrate and other inorganic nitrogen compounds in harbour waters. These originate from river sources (primarily the Frome and Piddle) primarily as a result of agricultural run-off. Sewage treatment works discharging to the rivers also contribute to the issue. The smothering effect of excessive macroalgal growth is putting the environment and ecology of Poole Harbour at risk, by reducing invertebrate food supplies to birds and species diversity.

37 The Environment Agency has published a nutrient management plan for the harbour, entitled the 'Strategy for Managing Nitrogen in the Poole Harbour Catchment to 2035'. This aims to ensure that the condition of the wider catchment for the harbour can be improved.

Coastal Waters

38 Dorset's coast is of particular significance, as reflected in the designation of the Heritage Coast and the World Heritage Area. Coastal waters/harbours of particular significance include the Fleet (the area enclosed by Chesil Beach) and Poole Harbour. The latter is one of the largest harbours in the world, and lies over the Wytch Farm oilfield, the largest onshore oilfield in the UK. As noted above, the Frome and the Piddle drain into Poole harbour, so waste facilities situated within the valleys of these rivers have the potential to impact on Poole Harbour itself.

39 A Shoreline Management Plan (SMP) is a large-scale assessment of the risks associated with coastal processes and helps reduce these risks to people and the developed, historic and natural environments. Coastal processes include tidal patterns, wave height, wave direction and the movement of beach and seabed materials. SMPs will provide a 'route map' for local authorities and other decision makers to move from the present situation towards meeting our future needs, and will identify the most sustainable approaches to managing the risks to the coast in the short term (0-20 years), medium term (20-50 years) and long term (50-100 years).

40 Within these timeframes, the SMPs will also include an action plan that prioritises what work is needed to manage coastal processes into the future, and where it will happen. This in turn will form the basis for deciding and putting in place specific flood and erosion risk management schemes, coastal erosion monitoring and further research on how we can best adapt to change.

41 There are two SMPs covering the Dorset coastline:

- Durlston Head to Rame Head (South Devon & Dorset) ⁽⁹⁾
- Hurst Spit to Durlston Head (Poole & Christchurch Bays) ⁽¹⁰⁾

9 <http://www.sdadcag.org/SMP.html>

10 <http://www.twobays.net/index.htm>

42 The National Planning Policy Framework covers coastal change, meaning physical change to the shoreline, i.e. erosion, coastal landslip, permanent inundation and coastal accretion. The Government's aim is to ensure that our coastal communities continue to prosper and adapt to coastal change. Local planning authorities should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast. The NPPF advocates that Coastal Change Management Areas should be designated where an area is likely to be affected by physical changes to the coast.

43 In terms of water quality, the bathing water results announced by Defra for 2009 showed a significant improvement on the previous year with 186 (97.3 per cent) of the bathing waters in the South West passing the water quality standard. Five bathing waters failed to meet the mandatory (basic) standard, compared to 10 last year. In England and Wales, 98.6 per cent of bathing waters around England and Wales passed mandatory EC water quality standards this year, up 2 per cent from 2008. 82.2 per cent of sites met the more stringent EC guideline standard – up from 71.7 per cent in 2008. In the South West, 84 per cent met the EC Guideline standard compared with 75.4 per cent compliance for 2008 ⁽¹¹⁾.

Groundwater

44 Groundwater is water contained within underground rock layers. Its presence is the result of precipitation, which soaks into the soil, with excess rainfall flowing overland to rivers. Once the needs of plant roots and soil moisture have been satisfied, the remaining water continues downward to rock layers beneath the soil. These underground rock layers have the capacity to let water flow through them, either through large cracks and openings in the rock, or through tiny inter-connected spaces between individual rock grains. The water contained in these rocks is groundwater; and these bodies of rock (from which groundwater can be extracted) are known as aquifers.

45 Water aided by gravity naturally fills the aquifer from the bottom upwards. This bottom part of the aquifer has spaces that are completely filled by water and this is known as the saturated zone of the aquifer. In the top part of the aquifer the rock spaces contain air as well as water, here the aquifer zone is called unsaturated. The margin where the aquifer changes from unsaturated to saturated is marked by the water table.

46 The Environment Agency seeks to protect groundwater by identifying different types of aquifer. They are categorised using aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

47 The aquifer designations comprise:

- 1. Principal Aquifers** - these are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
- 2. Secondary Aquifers** - these include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

11 Environment Agency - news releases

- Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;
 - Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
 - Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
3. **Unproductive Strata** - these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

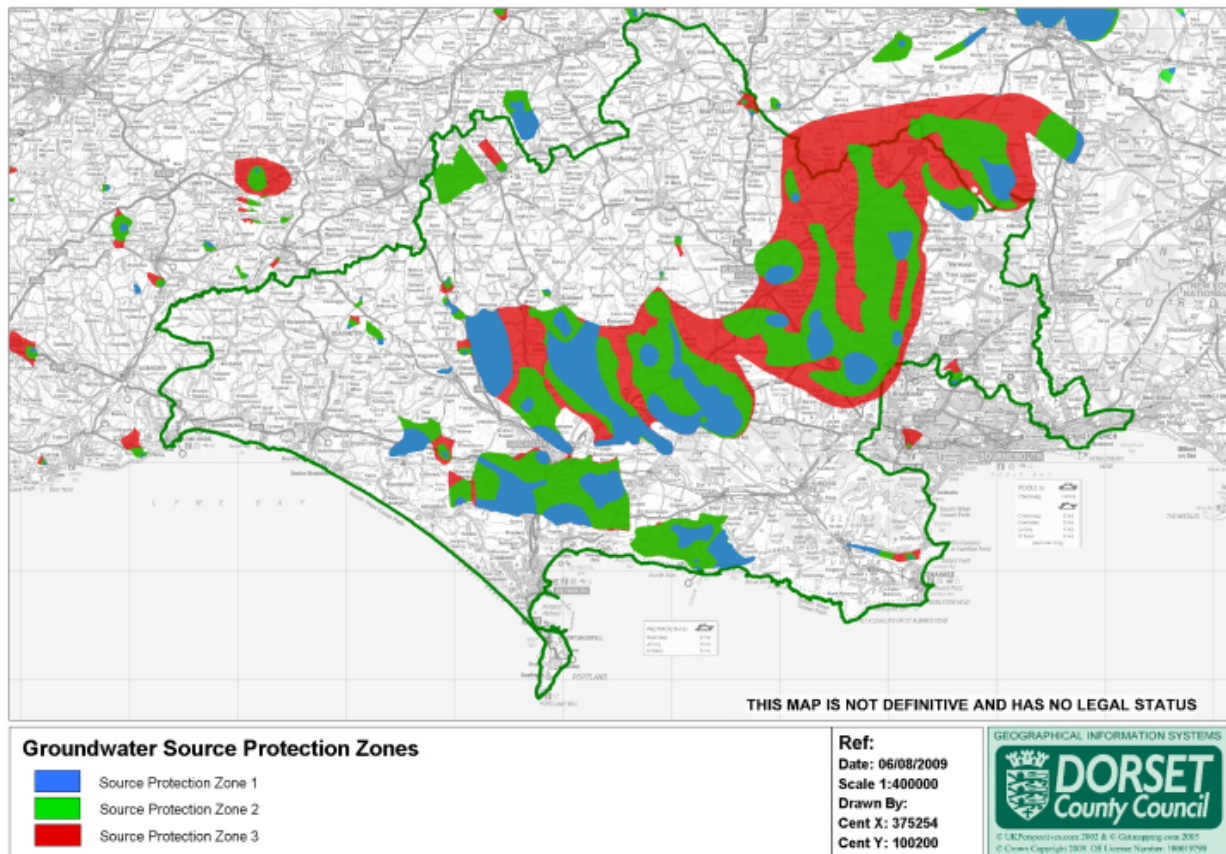
48 Groundwater is vulnerable to a variety of contaminants. The Environment Agency monitors groundwater quality and levels across Dorset and the wider South West region. The principal diffuse contaminant is nitrate, the source of which is likely to be the application of nitrate fertilisers and manure to agricultural land. Nitrate can enter the aquifer in recharge areas, as it is leached from fertiliser-rich agricultural soils. Herbicides have also been detected in groundwater, again probably in relation to their agricultural use within the area being monitored.

49 To minimise the potential impacts on groundwater, Principal and Secondary aquifers are designated, as discussed above. The Environment Agency defines Source Protection Zones (SPZs) as a planning tool to protect groundwater quality in the vicinity of potable supplies, since groundwater is a source of drinking water. In the case of larger strategic supplies bespoke sources protection zones have been delineated and published on the Environment Agency's website. However all abstractions used for potable supply, including private domestic supplies, benefit from a source protection zone of no less than 50 radial distance from the source. The source protection zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest to a groundwater source. The zones are used in conjunction with the Groundwater Protection Policy to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.

50 The shape and size of a zone depends on the condition of the ground, how the groundwater is removed, and other environmental factors. The definition of a zone includes finding out how the groundwater behaves in that area, what constructions there are to get the water out into the public water supply, and the process for doing this. From this it is possible to develop a model of the groundwater environment on which to define the zones.

51 SPZs in Dorset are shown below in Figure 8. The Zones are subject to continual revision and modification by the Environment Agency.

Figure 8 Source Protection Zones



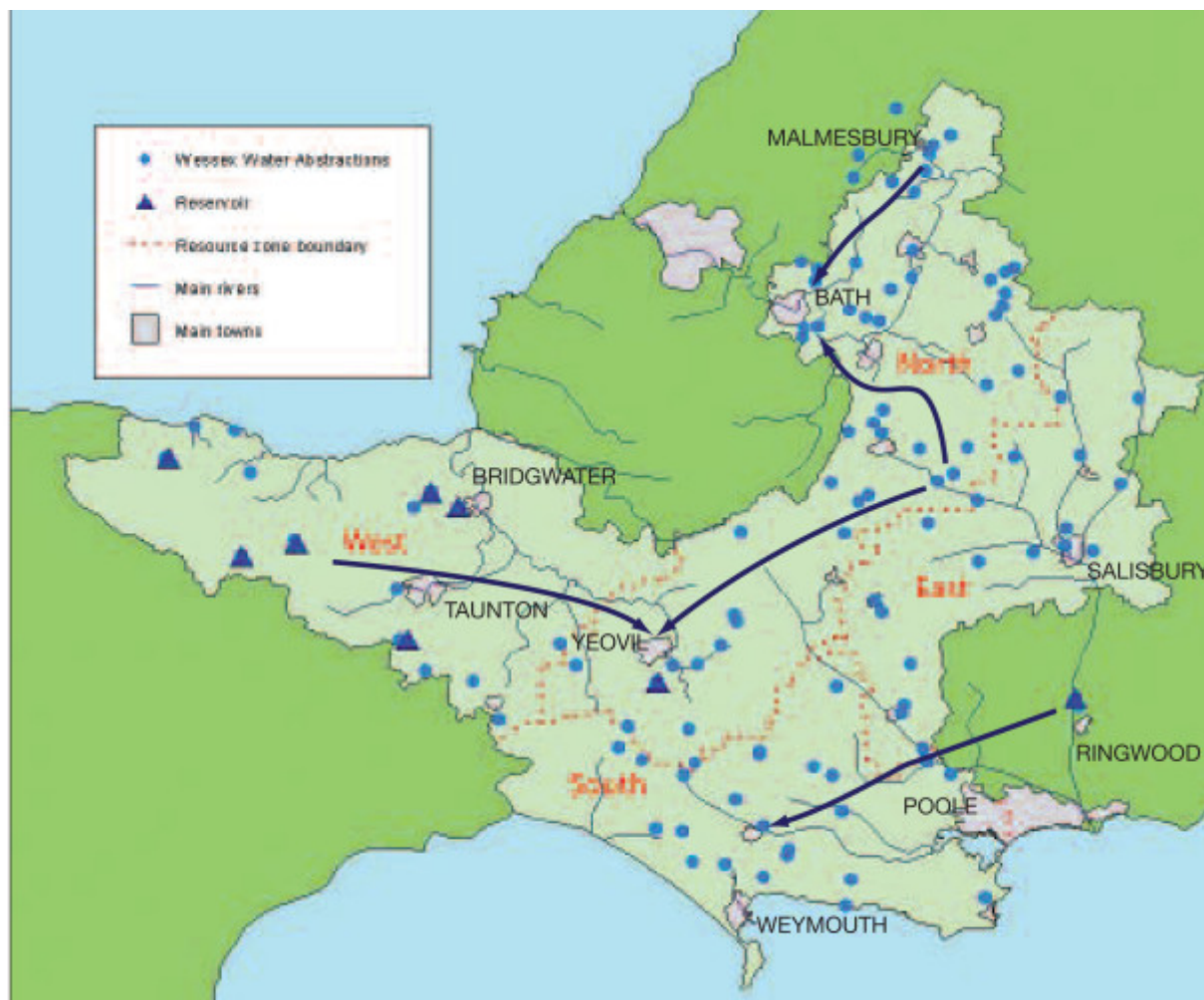
Water Consumption and Resources

52 Water for human consumption and use is treated and supplied by two water companies in Dorset - Wessex Water and Sembcorp Bournemouth Water.

53 For **Sembcorp Bournemouth Water**, their major sources of water are direct river abstractions from the Dorset Stour and the Hampshire Avon along with a number of groundwater sources. Their supply area covers some of the most environmentally important locations in the region, including the Avon Valley, Christchurch Harbour, and parts of the New Forest. Options for new water resource developments are therefore extremely limited, and have very high environmental values. The main finding of their Water Resources Management Plan 2009 is that, providing they continue to implement measures to manage demand, no new water resources will need to be developed.

54 **Wessex Water** currently works on the basis of four resource zones; North, South, East and West as shown in Figure 11. The assessment of demand and supply is not done at a company level but at a resource zone level. A resource zone is defined by the Environment Agency as “the largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall” Wessex Water, in their current Water Resources Management Plan, have identified that in the South and West Resource Zones, which cover most of Dorset, there is enough available water resources to meet demands over the coming years.

Figure 9 Wessex Water Resource Zones



Source: Wessex Water - Water Resources Management Plan (May 2008)

55 In relation to mineral extraction, dewatering of quarries is a key area where impacts on the water environment need to be taken into account. The process takes place where mineral working will be below the water table. This can be the case for sand and gravel extraction. Dewatering can cause loss of groundwater resources from the saturated zone, drying up of abstraction wells, reduction in water in surface features and changes to groundwater flow paths.

56 It should also be noted that water resource availability for the future is uncertain. However, future water resource availability pressures will not be limited to the south and east of England. Under many of the scenarios considered by the Environment Agency, south west England, as well as northern England and Wales, are likely to see significant unmet demand in the future. ⁽¹²⁾

Flooding

57 Flooding can have widespread effects on property, land, people and other sensitive receptors and can be caused by both river, sea and groundwater levels as well as excess runoff from the land.

12 The Case for Change: Current and Future Water Availability (Environment Agency)

58 In 2009, Defra produced a National Rank Order of Settlements Susceptible for Surface Water Flooding. Table 1 outlines the top ten areas and number of properties, within Dorset, Bournemouth and Poole susceptible to surface water flooding resulting from severe rainfall and the rank in England of each settlement (out of 4,215, 1 being most properties at risk).

Table 1 Top 10 'at risk' Settlements in Dorset (inc Bournemouth and Poole)

England Settlement Rank	Settlement Name	Estimated Properties at Risk
74	Bournemouth	4100
114	Poole	3000
205	Weymouth	1700
268	Bridport	1300
270	Christchurch	1300
273	Dorchester	1300
385	Swanage	820
412	Wimborne Minster	760
442	Ferndown	690
459	Gillingham	660

59 Planning Practice Guidance to the NPPF retains key elements of PPS25 in relation to flood risk. Flood risk has two components: the chance (probability) of a particular flood and the impact (or consequence) that the flood would have if it happened. The probability of a flood relates to the likelihood of a flood of that size occurring within a one year period. It is expressed as a percentage. For example, a 1% flood has a 1% chance or 0.01 probability of occurring in any one year, and a 0.5% flood has a 0.5% chance or 0.005 probability of occurring in any one year.

60 The Environment Agency publishes Flood Zone Maps. Flood Zones are based on annual probabilities of flooding, and show the flooding that would occur without the presence of flood defences.

Flood Risk Zone 1 - Low Probability

Definition: This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

Flood Risk Zone 2 - Medium Probability

Definition: This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Zone 3a - High Probability

Definition: This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

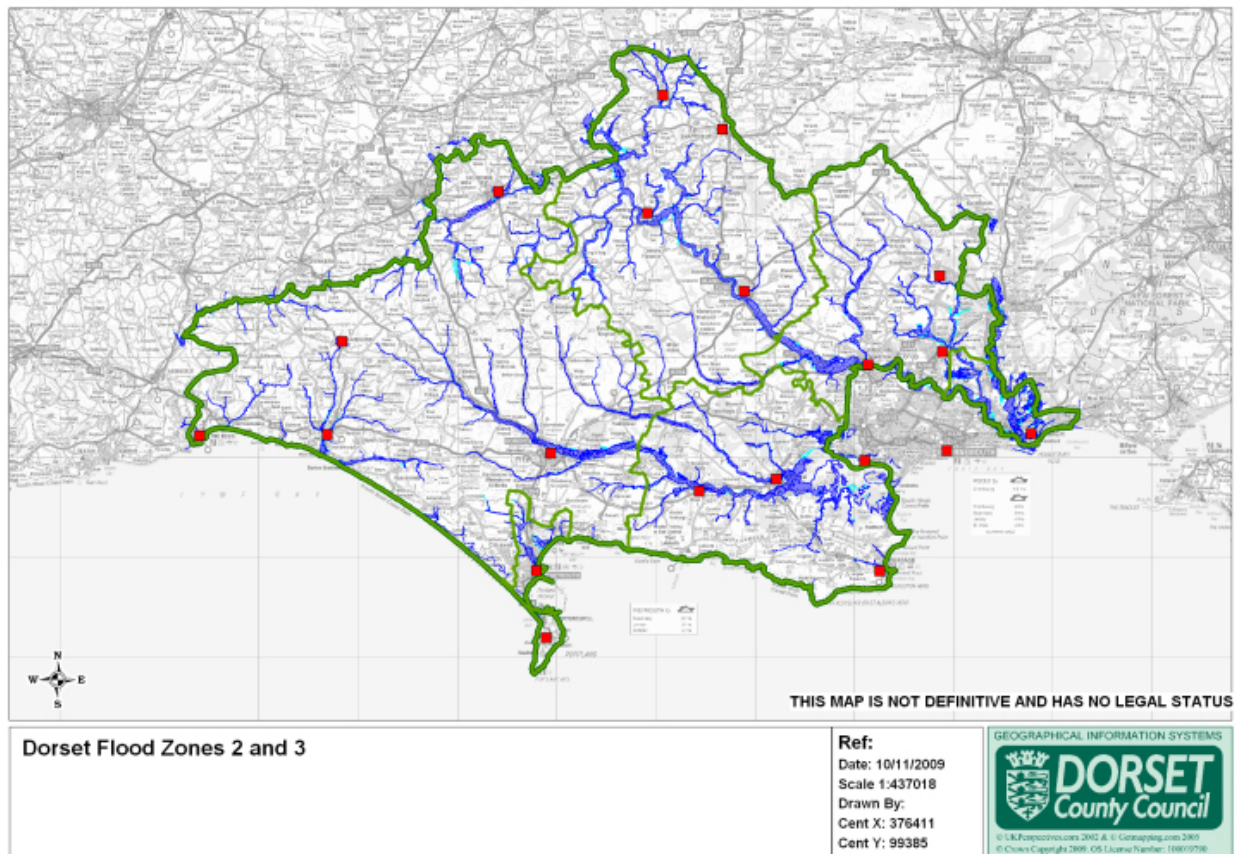
Zone 3b - The Functional Floodplain

Definition: This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood).

PPS25 - Development and Flood Risk (December 2006)

61 Figure 10 below shows Flood Zones 2 & 3 for river flooding in Dorset.

Figure 10 Dorset Flood Zones 2 & 3



62 The **Dorset Stour catchment** has a long history of flooding. The most significant event in recent years occurred in Iford and Longham and other hamlets in November 2002 when 80 properties were affected by river flooding after a period of heavy rainfall on a saturated catchment.

63 Overview of the current flood risk: At present there are around 1,500 people and 800 commercial and residential properties at risk in the whole catchment from a 1% annual probability river flood taking into account current flood defences. This means that 1% of the total population living in the catchment are currently at risk from flooding.

64 It is difficult to assess the current impact of flooding to environmental features. Designated sites at risk would not actually be damaged by the inundation, and in some, the ecosystem depends on flooding. 17 Scheduled Monuments are at risk of flooding, these being mostly bridges. Again, the actual risk of damage from flooding is limited ⁽¹³⁾.

65 The **Frome and Piddle catchment** also has a long history of flooding. The most significant event in recent years occurred in Piddletrenthide, Maiden Newton, Sydling St Nicholas and other hamlets in October 2000 to January 2001 when 90 properties and two caravan parks were affected by groundwater, surface water and river flooding after periods of heavy rainfall.

66 Currently the main sources of flood risk for people, property, infrastructure and the land are:

13 Dorset Stour Catchment Flood Management Plan - Environment Agency

- river flooding from the River Frome in Dorchester and Maiden Newton, River Piddle in Wareham, River Carne in Cerne Abbas, and River Swan in Swanage;
- tidal flooding in Wareham and Swanage;
- surface water drainage flooding, which has occurred in Frampton, Swanage and Wareham. Other towns have the potential to be at risk from surface water flooding;
- groundwater flooding which has occurred in Milborne St Andrew, Cerne Abbas, Dorchester and other isolated locations throughout the catchment.

67 Overview of the current flood risk: At present there are around 1,900 people and 1,160 commercial and residential properties at risk in the whole catchment from a 1% annual probability river flood taking into account current flood defences. This means that 1% of the total population living in the catchment are currently at risk from flooding.

68 It is difficult to assess the current impact of flooding to environmental features. Designated sites at risk would not actually be damaged by the inundation. Twelve Scheduled Monuments are at risk of flooding, these being mostly bridges. The actual risk of damage from flooding is limited ⁽¹⁴⁾.

69 Sources of flood risk within the **West Dorset catchment** include fluvial, surface water and tidal flooding. Fluvial flood risk is associated with the Rivers Char, Brit, Bride and Wey. Over half of all properties at risk and economic damages due to flooding are in Bridport. There are also significant numbers of properties at risk in Beaminster, Burton Bradstock and Nottingham. Several designated environmental sites and historical features are also at risk of flooding.

70 However, the number of caravan, camping and holiday parks at risk is a particular issue in this area. Although a flood warning system is in place for the River Char, Brit, Asker, Bride and Wey, in some areas, particularly upstream, there is less than two hours warning of an impending flood. There is no flood warning for many locations next to smaller watercourses.

71 Overview of the current flood risk: Today, there are approximately 700 properties across the catchment at risk of flooding from rivers and the tide, at a 1 per cent annual probability (rivers) or 0.5 per cent annual probability (tidal) event. Also at risk are a water treatment works, two sewage treatment works, a fire station, two police stations, a care home, two health centres and a school. The area includes a number of caravan, camping and holiday parks that represent highly vulnerable communities at risk of flooding.

72 Within the floodplain are also a number of designated sites, including Radipole Lake SSSI, Lodmoor SSSI and parts of the Sidmouth to West Bay SAC, West Dorset SAC and Chesil and Fleet SPA, SAC and SSSIs.

Flood Risk Vulnerability Classification

73 Technical Guidance to the NPPF includes a table that lists the type of development that is appropriate according to its vulnerability to flooding. Landfill sites and sites used for waste management facilities for hazardous waste are classified as 'More vulnerable' and are appropriate in Flood Risk Zones 1 and 2. Development in Zone 3a would be subject to the exception test and development should not be permitted within the functional floodplain, Zone 3b. Other waste, water and sewerage treatment facilities are classified as 'Less vulnerable' and development is appropriate in Zones 1, 2 and 3a.

74 Waste treatment (except landfill* and hazardous waste facilities), minerals working and processing (except for sand and gravel working), water treatment works which do not need to remain operational during times of flood and Sewage treatment works are identified as 'less vulnerable' and appropriate 'in principle' in Flood Zones 3a, 3b 2 and 1. Sand and gravel working is identified as 'water compatible' and appropriate 'in principle' in all Flood Zones. However, development in Flood Zone 3a or 3b is likely to be unacceptable if it involves the raising of existing ground levels, or impedes flood flows and measures for flood compensation storage cannot be implemented.

Strategic Flood Risk Assessment

75 Dorset County Council commissioned a level 1 Strategic Flood Risk Assessment (SFRA) to provide an evidence base on flood risk for Bournemouth, Dorset and Poole to assist in the assessment of the various options and proposals for minerals and waste developments. The Districts within the County, together with Bournemouth and Poole Councils, are already covered by their own SFRAs, all of which are accessible online. The NPPF and Planning Practice Guidance maintain that Local Plans should be supported by Strategic Flood Risk Assessment and that policies should be developed to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards.

Summary of relevant policy documents

N.B. More detail on these and other policy documents is included at the end of this topic paper.

Table 2 Summary of Relevant Policy Documents

Policy Documents	Relevance to Waste and Minerals Plans
<p>Key International Policy</p> <ul style="list-style-type: none"> • EU Water Framework Directive (2000/60/EC) • EU Urban Waste Water Treatment Directive (1991/271/EC) • EC Groundwater Directive (80/68/EEC) 	<ul style="list-style-type: none"> • The policy guidance establishes the importance given to the water environment (ground, surface and coastal) at both national and international levels. • The emerging Waste and Minerals Plans will be required to take careful account of any possible impacts that waste facilities may cause to the water environment and minimise these impacts through provision of mitigation or if necessary avoiding the proposed development altogether. • For water, and particularly groundwater, the effects of possible cumulative impacts must be carefully considered and planning policy should seek to protect and improve water policy, and to minimise flood risk by locating new developments and associated plant in the most suitable (lowest risk) areas.
<p>Key National/Regional Policy</p> <ul style="list-style-type: none"> • Future Water - The Government's Water Strategy for England (2008) • Water for Life and Livelihoods - River Basin Management Plan South West River Basin District (EA) • Groundwater Protection: Policy and Practice GP3 (EA) • National Planning Policy Framework (2012) • Planning Practice Guidance (March 2014) • National Flood and Coastal Erosion Risk Management Strategy for England - Environment Agency 2011. 	
<p>Key Local Policy</p>	

Policy Documents	Relevance to Waste and Minerals Plans
<ul style="list-style-type: none"> • EA Catchment Flood Management Plans • Water Companies - Resource Management Plans • Dorset Coast Strategy • Dorset County Council Strategic Flood Risk Assessment 	

Potential impacts related to waste facilities

- Disturbance or removal of surface features such as watercourses or flood storage.
- Modification of rainfall/run-off relationships due to changes in nature of surface materials.
- Alteration of catchment size of headwater stream.
- Removal of unsaturated zone causing increased possibility of aquifer contamination, change in response rate of groundwater variations and loss of temporary groundwater storage.
- Contamination of surface and groundwater and siltation of watercourses
- Pollution from natural contaminants and fuels, oils and solvents.
- Pollution from industrial processes within the site.
- Obstruction of floodplains by waste tipping.
- Landfilling or backfilling sites with non-inert waste may generate landfill leachate causing groundwater pollution.
- The movement of waste up the waste hierarchy - diverting waste away from landfill
- The distribution (number and location) of waste facilities in the county
- Increased nitrogen into river catchments from sewage treatment works.

Potential impacts related to minerals development

- Effect on groundwater flow of investigative boreholes.
- Release of, or provision of pathways for, contaminated water from investigative drilling.
- Disturbance or removal of surface features such as watercourses or flood storage.
- Modification of rainfall/run-off relationships due to changes in nature of surface materials.
- Alteration of catchment size of headwater stream.
- Removal of unsaturated zone causing increased possibility of aquifer contamination, change in response rate of groundwater variations and loss of temporary groundwater storage.
- Excavation below the water table causing readjustment of hydraulic gradients and evaporation losses from open water.
- Removal of confining strata causing the floor to heave and water seepage.
- De-watering due to pumping from the sump of an excavation, causing loss of groundwater resources from the saturated zone, drying up of abstraction wells, reduction in water in surface features, changes to groundwater flow paths with possible contamination from external sources and saline intrusion, subsidence and settlement, degradation of archaeological sites.
- Water table rebound where other development has occurred in an area where de-watering has taken place over a long period, resulting in possible flooding, contamination and land instability due to rising groundwater levels.
- Contamination of surface and groundwater and siltation of watercourses by suspended sediment from mineral working and tipping of mineral waste.
- Pollution from natural contaminants and fuels, oils and solvents.
- Pollution from the working of previously contaminated land, including the reworking of mineral waste tips for secondary aggregates.

- Pollution from industrial processes within the site.
- Pollution through dredging of river and estuary beds.
- Effect on river tidal flows of estuarine dredging.
- Effects of open coast extraction on flood defence and coastal stability.
- Effects of restoration on open water due to contamination of open water body or underlying aquifers, readjustment of hydraulic gradients, evaporation losses and effects on land drainage in flood plains.
- Backfilling of excavated void may have effects on drainage and surface water run-off within the site, groundwater levels and flow paths in adjacent areas and water quality.
- Landfilling or backfilling with non-inert waste may generate landfill leachate causing groundwater pollution.
- Increased risk of groundwater flooding from low level restoration.
- Effects of long term pumping on other abstractors and wetland habitats.
- Varying impacts from post-restoration uses, e.g. use of fertilisers, surface water run-off, groundwater quality and levels, flood hydrology.

Issues relevant to Water

- Run-off water from sites may pollute water courses and soil. Water and soil pollution can be controlled through careful design and location of site planning, infrastructure, management, restoration, mitigation and compensation with appropriate conditions and considerations.
- If waste facilities or mineral extraction sites are in close proximity to the boundaries of the neighbouring authorities, their impact on water resources in the neighbouring areas may be an issue.
- Waste facilities and mineral working must be carefully designed not to cause risk of increased flooding and to ensure that facilities are not at risk of flooding. Proposed minerals developments must ensure they do not impede drainage in any way, and mineral processing plant is not at risk of flood damage.
- Opportunities to improve drainage, or minimise flood risk, should be taken where possible.
- In some instances, surface water or groundwater may need to be abstracted from mineral development sites. This causes changes in groundwater level through discharging water from extraction sites. Mineral extraction sites may therefore cause changes in groundwater level.
- Discharge of water into surface water courses from the site may cause flooding depending on the volume of water discharged. There may also be issues of silt deposition or turbidity.
- Proposed developments should not result in a net increase in nitrogen load to Poole Harbour. This is particularly relevant to proposals for sewage treatment works. Where proposed mineral sites can take land out of agricultural use this could provide a benefit in terms of reducing nitrate input into the harbour catchment.

Suggested Sustainability Objectives

To maintain, conserve and enhance the quality of ground, surface and sea waters and manage the consumption of water in a sustainable way.

To reduce flood risk and improve flood management.

...and Broad Indicators

"To what extent does the strategic option, objective, strategy or policy..."

- Protect or enhance the quantity and quality of ground, surface and sea waters?
- Avoid adverse effects on existing patterns of groundwater flow and/or surface water flow?
- Maintain water consumption within local carrying limits?
- Minimise the risks and impacts of flooding having taken into account climate change?
- Minimise the numbers of people and property at risk from flooding?

Relevant Policy Documents: Water

Table 3

<p>EU Water Framework Directive (2000/60/EC)</p> <p>The Directive seeks to protect inland surface waters, transitional waters, coastal waters and groundwater through:</p> <ul style="list-style-type: none"> • Preventing further deterioration and protecting and enhancing the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems; • Promoting sustainable water use; • Enhancing, protecting and improving the aquatic environment, inter alia, through specific measures for the progressive reduction or phasing out of discharges, emissions and losses of • priority substances; • Ensuring the progressive reduction of pollution of groundwater and preventing its further contamination; and • Contributing to mitigating the effects of floods and droughts. <p>The objectives of the waste and minerals plans should safeguard and protect groundwater resources, surface waters or river systems from pollution or degradation from waste facilities. The aim should be to protect and, where possible, improve surface, groundwater and drinking water quality in accordance with national legislation arising from the water framework directive.</p> <p>Implications:</p> <p>The Waste and Mineral Sites Plans will take into account the guidance and issues identified in this Directive. Water Framework Directive Assessments may be required for proposals/site allocations to be included in the plans.</p>
<p>EC Groundwater Directive (80/68/EEC)</p> <p>The objective of the Directive is to prevent polluting substances entering groundwater, primarily as a consequence of the disposal of waste substances. Since groundwater is a very important drinking water resource and, unlike most surface water, undergoes only very slow self-purification, it is prudent to take steps to protect groundwater resources.</p> <p>The Directive relates primarily to the disposal of a substance, or product, on its own or in conjunction with other substances. Approved uses, such as the application of pesticides to crops, are covered by other legislation, although the Groundwater Regulations may apply if there is a particular circumstance in which the risk to groundwater is deemed unacceptable.</p> <p>The Directive has been implemented in the UK by the Groundwater Regulations 1998 and Regulation 15 of the Waste Management Licensing Regulations 1994. The Directive specifies groups of substances that are considered to be particularly undesirable in groundwater. These fall into two lists.</p>

The Directive requires that substances in groups included on List I should be prevented from entering groundwater, directly or indirectly. A discharge containing substances from these List I groups can be allowed only if the substances are present in quantities and concentrations which are so small that there is no danger of causing deterioration in the

quality of the groundwater at the time of the discharge or in the future. For substances in the groups included in List II, the requirement of the Directive is that any discharge is limited so as to prevent any danger, then or in the future, of deterioration in the quality of the groundwater.

Implications:

The Waste and Mineral Sites Plans will take into account the guidance and issues identified in this Directive.

EU Urban Waste Water Treatment Directive (1991/272/EC)

The objective of this Directive is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors (see Annex III of the Directive) and concerns the collection, treatment and discharge of:

- Domestic waste water
- Mixture of waste water
- Waste water from certain industrial sectors (see Annex III of the Directive)

Implications:

The preparation of the emerging Waste Plan will take the requirements of this Directive into account.

Groundwater Protection: Policy and Practice GP3 Version 1.1 (EA, 2013)

This document sets out a framework for the EA's regulation and management of groundwater resources. The overarching aim is to protect and manage groundwater resources for present and future generations in ways appropriate to the risks identified by the EA.

Implications:

The preparation of the emerging Waste and Mineral Sites Plans will take the strategy into account.

Making space for water - Taking forward a new Government strategy for flood and coastal erosion risk management in England (DEFRA: 2005)

In this 'first response' document, Government confirmed the strategic direction of travel set out in the document 'Making space for water'. The Government will, over the 20-year lifetime of the new strategy, implement a more holistic approach to managing flood and coastal erosion risks in England. The aim is to manage the risks of flooding and coastal erosion in an integrated and holistic way, employing a portfolio of approaches, so as to reduce the threat to human life and property while furthering sustainable development and the strategic objectives of the Government; and to secure rational funding mechanisms that deliver appropriate levels of investment.

Implications:

The preparation of the emerging Waste and Mineral Sites Plans will take the requirements of this strategy into account.

Water - the Government's Water Strategy for England (2008)

Future Water sets out the Government's vision for sustainable delivery of secure water supplies and an improved and protected water environment. It includes:

- sustainable delivery of secure water supplies
- an improved and protected water environment
- fair, affordable and cost-reflective water charges
- reduced water sector greenhouse gas emissions and
- more sustainable and effective management of surface water.

Implications:

The preparation of the emerging Waste and Mineral Sites Plans will take the requirements of this strategy into account.

National Flood and Coastal Erosion Risk Management Strategy for England (Environment Agency, 2011)

The strategy sets out a statutory framework that will help communities, the public sector and other organisations to work together to manage flood and coastal erosion risk. It will support local decision-making and engagement in FCERM, making sure that risks are managed in a co-ordinated way across catchments and along each stretch of coast. This includes the development of local flood risk management strategies by lead local flood authorities, as well as our strategic overview of all sources of flooding and coastal erosion.

Implications:

~~The preparation of the emerging Waste and Mineral Sites Plans will take the requirements of this~~

Water for people and the environment: Water Resources Strategy for England and Wales (Environment Agency, 2009)

The Strategy sets out a series of actions under various headings, including:

- Climate Change
- A Better Water Environment
- Managing Water Resources
- Valuing Water

Implications:

The preparation of the emerging Waste and Minerals Sites Plans will take the requirements of this strategy into account.

South West River Basin Management Plan (Environment Agency 2009, with Erratum 2011)

This plan focuses on the protection, improvement and sustainable use of the water environment. River basin management is the approach the Environment Agency is using to ensure our combined efforts achieve the improvement needed in the South West river basin district. River Basin Management is a continuous process of planning and delivery. The Water Framework Directive introduces a formal series of 6 year cycles. The first cycle will end in 2015 when, following further planning and consultation, this plan will be updated and reissued. This plan has been prepared under the Water Framework Directive, which requires all countries throughout the European Union to manage the water environment to consistent standards.

The plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater.

Implications:

The preparation of the emerging Waste and Minerals Sites Plans will take the requirements of this document into account. It is anticipated that a revised River Basin Management Plan will be published in 2015 which should be taken account of.

A Sustainable Future for the South West: The Regional Sustainable Development Framework for the South West of England (SWRA: 2001)

Sets out a high level strategic framework for moving towards sustainable development in the South West. Objectives include:

Development & Planning

- Minimise the risk of flooding to people and places

Natural Resources & Waste

- Reduce pollution and improve water, land and air quality
- Ensure water, land, minerals, soils, forestry and other natural resources are used efficiently and with least environmental damage

Coast & the Maritime Environment

- Reduce diffuse marine pollution from land-based sources

Implications:

The preparation of the emerging Waste and Mineral Sites Plans will take the requirements of this document into account.

Our Environment: Our Future – the Regional Strategy for the South West Environment 2004-2014 (SWRA: 2004)

The purpose of the strategy is to generate awareness of the importance of the South West environment, identify priorities for protecting and enhancing the environment and to provide a framework for action in the South West.

Aims

- Protect and improve the quality of our air, soils and water
- Manage flood risk to land and property

Targets (in development)

- Restore sustainable flows to 15 rivers by 2010.
- Ensure that nationally, 95% of inland and coastal waters achieve requirements of EC use-related Directives.
- Reduce water demand.

Implications:

The preparation of the emerging Waste and Mineral Sites Plans will take the requirements of this document into account.

South West Regional Flood Risk Appraisal (SWRA: 2007)

The purpose of the RFRA is to provide a broad regional understanding of the risk that flooding creates in the South West. It assesses how flood risk has been taken into account during the planning process and the Regional Spatial Strategy. It also provides supplementary guidance and help to Strategic and Local Authorities by presenting the strategic areas significantly at risk in each of the sub-regions. By considering the various courses of flooding in the 9 sub-regions the RFRA aids to the completion of the Local Planning Authorities' individual Strategic Flood Risk Appraisals.

Implications:

Although not primarily intended to guide the preparation of DPDs, it will be taken into consideration in the preparation of the emerging Waste and Minerals Sites Plans.

Strategy for Managing Nitrogen in the Poole Harbour Catchment to 2035

The Nitrogen Reduction Strategy identifies the source of nitrogen entering the catchment for Poole Harbour, sets a target that should be achieved to bring the catchment back to 'Good Status' and highlights options that might be considered for achieving this.

The key objectives of the strategy are:

- To bring the catchment to good status, nitrogen entering the harbour from non-marine sources, should be reduced to 1732 tonnes N/yr.
- Land owners should ensure their land use activities do not exceed maximum leaching target of 18.3kg N/ha, when considering all rural land uses. Where possible this should be delivered voluntarily.

- New development (residential and commercial) should not result in a net increase in nitrogen load.

Implications:

Policies and proposals in the Waste Plan and Mineral Sites Plan should have regard to the strategy and in particular should not result in a net increase in nitrogen load. This is particularly relevant to proposals for sewage treatment works. Where proposed mineral sites can take land out of agricultural use this could provide a benefit in accordance with the strategy.

Catchment Abstraction Management Strategies

CAMS are six-year plans detailing how we the EA will manage water resources within catchments. Each strategy stands for a six year period until it is reviewed. CAMS within Dorset are:

- Dorset Stour (2004)
- Frome, Piddle and Purbeck (2005)
- West Dorset Streams (2007)

Implications:

Waste and Minerals Sites Plans to be prepared taking into account the guidance and issues identified in these Strategies.

Dorset Stour Catchment Flood Management Plan

Draft Frome and Piddle Catchment Flood Management Plan

West Dorset Catchment Flood Management Plan(Environment Agency, 2006)

Catchment Flood Management Plans are strategic planning tools through which the EA will seek to work with other key decision-makers within river catchments to identify and agree policies for sustainable flood risk management.

Draft policy appraisal objectives:

- Prevent an increase in the number of people exposed to flooding
- Increase in the number of recipients to the river and groundwater flooding warning services
- Prevent an increase in the number of properties and infrastructure exposed to flooding
- Prevent an increase in the damages to high quality agricultural land
- Increase the area of wetland habitat
- Increase the length of watercourses in a naturally functioning state
- Prevent any negative impacts on the landscape character

Implications:

The Waste and Minerals Sites Plans should reduce and limit risk of groundwater and river flooding through taking into account the requirements of the Flood Management Plan and working closely with the EA..

Wessex Water - Water Resources Management Plan

Wessex Water supplies 1.2 million people in the south west of England with high quality drinking water, using 105 sources, 110 water treatment works and 11,400 km of water mains. This plan outlines how the company intends to ensure a reliable water supply over the next 25 years.

This plan describes how the company plan to:

- forecast the demand for water over the next 25 years
- assess the available output of our current sources of supply
- allow for any reductions in source outputs to improve river flows
- calculate the balance between supply and demand
- determine what options are available to overcome any deficits
- Take action to overcome deficits

Implications:

The preparation of the Waste and Minerals Sites Plans will take this document into account.

Securing Water Supplies - the development of a more integrated water supply grid (Wessex Water: 2008)

Describes key issues faced by Wessex Water, such as:

- improving the security and reliability of supply to all customers, even in the event of a source failure such as when one of Severn Trent's water treatment works was flooded in the summer of 2007
- meeting customers' demand for water over the next 25 years
- meeting the reductions in abstraction licences required by the Environment Agency to improve flows in some rivers to protect their ecology
- dealing with deteriorating raw water quality, particularly nitrate and cryptosporidium at some groundwater sources
- accounting for the potential impacts of climate change.

This report describes what developing a more integrated water supply grid would involve, provides further details of the water supply issues that we are facing and explains how the grid would overcome these. It also describes how the problems could alternatively be tackled by standalone solutions.

Implications:

The preparation of the Waste and Minerals Sites Plans will take this document into account.

Bristol Water - Draft Water Resource Plan (2008)

The Plan describes how the company will cope with future challenges and continue to provide customers with a safe, secure and affordable water supply in the decades ahead. It covers the following:

- Policies putting customers at the heart of our planning process and ensuring that the security of the water supply is maintained

- The current position on the water we have available, present demand, and security of the supply
- How the forecast housing growth of 30% and population growth of 20% in our supply area will increase the demand for water over the next 30 years
- What measures we have considered to cope with the projected growth in demand and what social and environmental consequences these may have
- How climate change will reduce the availability of water that can be abstracted from the environment without causing damage
- The strategy we propose over the next 25 years to cut leakage, increase water efficiency and enhance existing sources of water -- ensuring an affordable, secure and sustainable water supply in future

Implications:

The preparation of the Waste and Minerals Sites Plans will take this document into account, as relevant.

Bournemouth and West Hampshire Water - Water Resources Management Plan 2009

The main finding of this plan is that, providing BWH continue to implement the measures to manage demand consistently followed since the late 1990s, there will not be a need to develop any new water resources to maintain the balance between supply and demand. It is expected that climate change will be an ongoing area of focus for the water industry.

Implications:

The preparation of the Waste and Minerals Sites Plans will take this document into account.

Strategic Flood Risk Assessment

The SFRA was prepared by Halcrow for Dorset County Council and provides an evidence base on flood risk for Bournemouth, Dorset and Poole to assist in the assessment of the various options and proposals for minerals and waste development.

This SFRA provides the following:

- General guidance about locations where flood risk is an issue
- Strategic advice on the issue of flood risk relevant to the preparation of the Minerals and Waste Development Framework.
- Information to inform the preparation of policies relating to flooding, managing flood risk, land use and development allocations within the Development Plan Documents

Implications:

The SFRA is an important source of baseline information specific to Dorset, Bournemouth and Poole and should inform the development of policies and allocation of specific sites in both the Waste Plan and Mineral Sites Plan.

Dorset Coast Strategy (1999)

In 1999 the Dorset Coast Strategy was published. Developed by the Dorset Coast Forum, it sets out a future for the coast, covering the coastline and inshore seas from Lyme Regis to Highcliffe. There are four key elements to the Dorset Coast Strategy:

- Vision: A clear vision of the future of the Dorset Coast
- Principles: A basis for widespread agreement on future planning and management
- Priorities: Nine priorities for the future management of Dorset's coast
- Action: Detailed policies and actions to achieve progress with each priority.

In 2005 the Dorset Coast Strategy was reviewed. The results of the review were published in the document State of the Dorset Coast.

Implications:

The principles and priorities of the Dorset Coast Strategy should be reflected in the development of the Waste and Minerals Sites Plans.

Planning Practice Guidance (March 2014)

The National Planning Policy Framework sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed.

Planning Practice Guidance accompanies the NPPF and should be used when flood risk is an issue. The guidance sets out the main steps to be followed, in summary, are designed to ensure that if there are better sites in terms of flood risk, or a proposed development cannot be made safe, it should not be permitted.

Implications:

This guidance should inform the development of policies and allocation of specific sites in both the Waste Plan and Mineral Sites Plan.