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The Isle of Wight Catchment Abstraction Management Strategy

Final Strategy
March 2004



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Foreword

Water is essential for natural life and for human use. We use it in our homes and gardens, in commerce and industry, and in agriculture. The way that we use water has a direct impact on the natural environment. This means that we must have a plan for the management of water that will protect the long term future of the environment while encouraging sustainable development.

Water resource management policies on the Isle of Wight have been formulated over many years and the development of the Catchment Abstraction Management Strategy (CAMS) builds on and consolidates these. The strategy's main aims are to provide a consistent balanced approach to local catchment management which is accessible to the public and has involved stakeholder participation in its development.

Water resources on the Isle of Wight are finely balanced with up to a quarter of its public water supply already coming from the River Test in Hampshire. Public Water Supply, the environment, agriculture and horticulture all compete for water from the Island's small rivers and limited groundwater supplies.

The first Isle of Wight CAMS is a starting point for assessing the status of the Island's water resources. A number of these resources appear to be over-abstacted but, before any long-term remedial action is taken, it is recognised that more robust environmental, surface water and groundwater information is required to ratify the results.

This document sets out our policies for managing groundwater and surface water abstraction licences on the Isle of Wight for the next six years. It also details key actions that will be taken before the next review of the strategy in 2008.

Peter Quarmby Hampshire & Isle of Wight Area Manager

Contents

1	Introduction	1
2	Consultation on the Isle of Wight CAMS	2
3	The CAMS area	3
3.1.	Hydrology and Hydrogeology	3
3.2.	Hydrometry	6
3.3.	Abstractions and Discharges	8
3.4.	Conservation Designations	8
3.5.	Status of Ecology and Fisheries	11
3.6.	Water Quality	13
3.7.	Stakeholder Concerns	14
3.8.	Links with Other Plans	14
4	Resource assessment and resource availability status	15
4.1.	Introduction	15
4.2.	Resource assessment of groundwater management units	17
4.3.	Resource assessment of river assessment points	17
4.4.	Integration of the surface water and groundwater resource assessments	20
4.5.	Water Resource Management Units (WRMU's) in the Isle of Wight CAMS	20
5	Licensing strategy	25
5.1.	Sustainability appraisal	25
5.2.	Licensing strategy Development	25
5.3.	Climate Change	27
5.4.	Catchment overview of licensing strategy	28
5.5.	Water Resource Management Unit 1 – Eastern Yar	30
5.6.	Water Resource Management Unit 2 - Medina	31
5.7.	Water Resource Management Unit 3 – Lukely Brook	32
5.8.	Water Resource Management Unit 4 – Brighstone Stream	33
5.9.	Water Resource Management Unit 5 – Atherfield Brook	34
5.10.	Water Resource Management Unit 6 – Central Chalk (West)	35
5.11.	Water Resource Management Unit 7 – Central Chalk (East)	36
5.12.	Water Resource Management Unit 8 – Southern Downs Chalk	37
5.13.	Water Resource Management Unit 9 – Lower Greensand	38
5.14.	Remaining CAMS Area not within a Water Resource Management Area	39
5.15.	Summary of Licensing Policy for the Isle of Wight CAMS area	40
5.16.	Opportunities for licence trading in the Isle of Wight CAMS area	40
5.17.	Water Act 2003	41
5.18.	Water efficiency	41
6	Future developments in the CAMS area	42
7	Post-CAMS Actions	43
	Appendix 1: Useful Water Efficiency Contacts	44
	Glossary	45
	List of abbreviations	49

Introduction

ISLE OF WIGHT Catchment Abstraction Management Strategy (CAMS) Consultation Document

The Vision:

To make the best use of water resources on the Isle of Wight in order to:

- Ensure reliable supplies of water for the public
- Protect rivers and wetlands from the effects of unsustainable abstraction
- Share water between conflicting demands in the face of changes in legislation and in climate.

Catchment Abstraction Management Strategies (CAMS) are strategies for management of water resources at a local level. They will make more information on water resources and licensing practice 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 by determining whether they should be renewed and, if so, on what terms.

Managing Water Abstraction: The Catchment Abstraction Management Strategy Process is the national document that supports the development of CAMS at a local level. It sets out the national policy and the regulatory framework within which CAMS operate, describes the process of developing CAMS and provides information on the structure and content of CAMS documents. This Catchment Abstraction Management Strategy should be read in conjunction with *Managing Water Abstraction*.

The Isle of Wight CAMS sets out how much water is available in the catchment and details the Environment Agency's policy for the management of this water, now and in the future. It is the second of four CAMS to be produced for Hampshire and the Isle of Wight.

A technical document (final version) for the Isle of Wight CAMS has been produced which provides the detailed technical information on which the development of the strategy has been based.



The Needles (IOW Tourism)

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Consultation on the Isle of Wight CAMS

Consultation is an integral part of the CAMS process. It is important because it ensures that the CAMS process is as transparent as possible and gives everyone the opportunity to get involved. For the Environment Agency to manage water resources in a catchment effectively and sustainably, it is important that as much information as possible is collated on water needs and uses. Comments and suggestions have been gathered during the early stages of development of this strategy through various pre-consultation activities. These were:

- Wide circulation of an awareness raising leaflet
- Setting up of a CAMS Stakeholder Group
- Contact with a wider consultation group
- Setting up of a multi-disciplinary CAMS project team

The leaflet was distributed in August 2002. Its aim was to raise awareness of the development of the CAMS in the local area and it also invited anyone with an interest to send in written comments, providing information, views and suggestions.

A stakeholder group was set up for the Isle of Wight CAMS. The role of the stakeholder group was to represent the key interests in the catchment and to help identify issues of local significance, provide views on proposals and to consider the likely implications of different strategy options. The members of the Isle of Wight CAMS stakeholder group and the interests they represented are as follows:

Mr Mike Jordan:	Chairman
Mr Dave Moore:	Local Planning
Dr Colin Pope:	Local Ecology
Mr Ian Boyd:	Island 2000 Trust
Mr Chris Hynes:	Horticulture
Mr Tom Smith:	Agriculture
Mr Hal Matthews:	Tourism
Mr Mike Cunningham:	County Councillor
Mr Andy Gordon:	English Nature
Mr Paul Seeley:	Water Companies
Mr Andy Ball:	(Replaced Paul Seeley)

Obviously it was not possible to include representatives from all organisations on the Stakeholder Group. In addition to the above members contact was therefore established with a number of organisations inviting input into the process. Representatives from those organisations were also supplied with copies of the minutes after each meeting. These included:

Mr R. Grogan:	Wight Wildlife
Mr R. Kirby:	Isle of Wight Freshwater Fishing Association
Mr J.Archer:	NFU (South East Region)
Mr D.Langford:	Country Land & Business Association

There was also a formal consultation on the Isle of Wight CAMS through a consultation document, distributed in September 2003. The responses received were analysed and taken into account as the strategy was finalised. This CAMS document now sets out the final strategy that has been determined for the Isle of Wight CAMS area.

The CAMS Area

The Isle of Wight CAMS covers the whole of the Isle of Wight, an area of 380km², located about 5 kms south of the Hampshire mainland. The main administrative centre is at Newport, in the centre of the Island, with other major urban centres at Cowes, Ryde, Sandown, Shanklin, Freshwater and Totland (Figure 1). The population of approximately 130,000 increases dramatically during the holiday season.



Entering Cowes

The remainder of the Island's landscape is mainly rural and scenic, with roughly half of the area and its coastline designated as an Area of Outstanding Natural Beauty (AONB) and Heritage coastline respectively. The land is dotted with a number of small attractive villages historically served by their own water supply, a fact that has added to the complexity of the Island's current water supply network. Another widespread feature of the landscape is the intensive farming and horticulture which occupies much of the southern half of the Island.

3.1. Hydrology and Hydrogeology

The geology of the Isle of Wight is quite complex with a variety of strata exposed across the island. (Figure 2) There are three major aquifers on the Isle of Wight, all of which are heavily abstracted and comprise:

- a central ridge of outcropping Chalk and Upper Greensand running from east to west in the centre of the Island;
- an area of outcropping Chalk and Upper Greensand in the south, forming the Southern Downs;
- a substantial area of sands and clays in the southern half of the Island termed the Lower Greensand, the lateral and vertical layering of which are particularly complex.

The clay and sand deposits in the northern half of the Island are classified as minor and non-aquifers and little is known of their hydrogeology. There is very little abstraction in this area of the Island.

With the exception of several small streams on the south coast, all the Island's rivers and streams flow north. The main rivers are the Eastern Yar and Medina, both rising as Chalk springs from the Southern Downs and gaining flow along their lengths as they cross the Lower Greensand.

The Eastern Yar rises at Niton and flows 27km collecting the Wroxall Stream, Scotchells Brook and a number of small tributaries before cutting through the central Chalk ridge at Brading and joining the sea at Bembridge. Many sections of the main river and its tributaries have been dredged and straightened over the years and the channel engineered for land reclamation and agricultural drainage.

The Medina rises near Chale and flows north 17km collecting the Merstone stream at Blackwater before intersecting the central Chalk ridge at Shide and flowing through a tidal estuary into the Solent at Cowes. One of its major tributaries is the Lukely Brook which rises on the central Chalk west of Newport flowing through Carisbrooke over the Chalk before joining the head of the Medina Estuary.

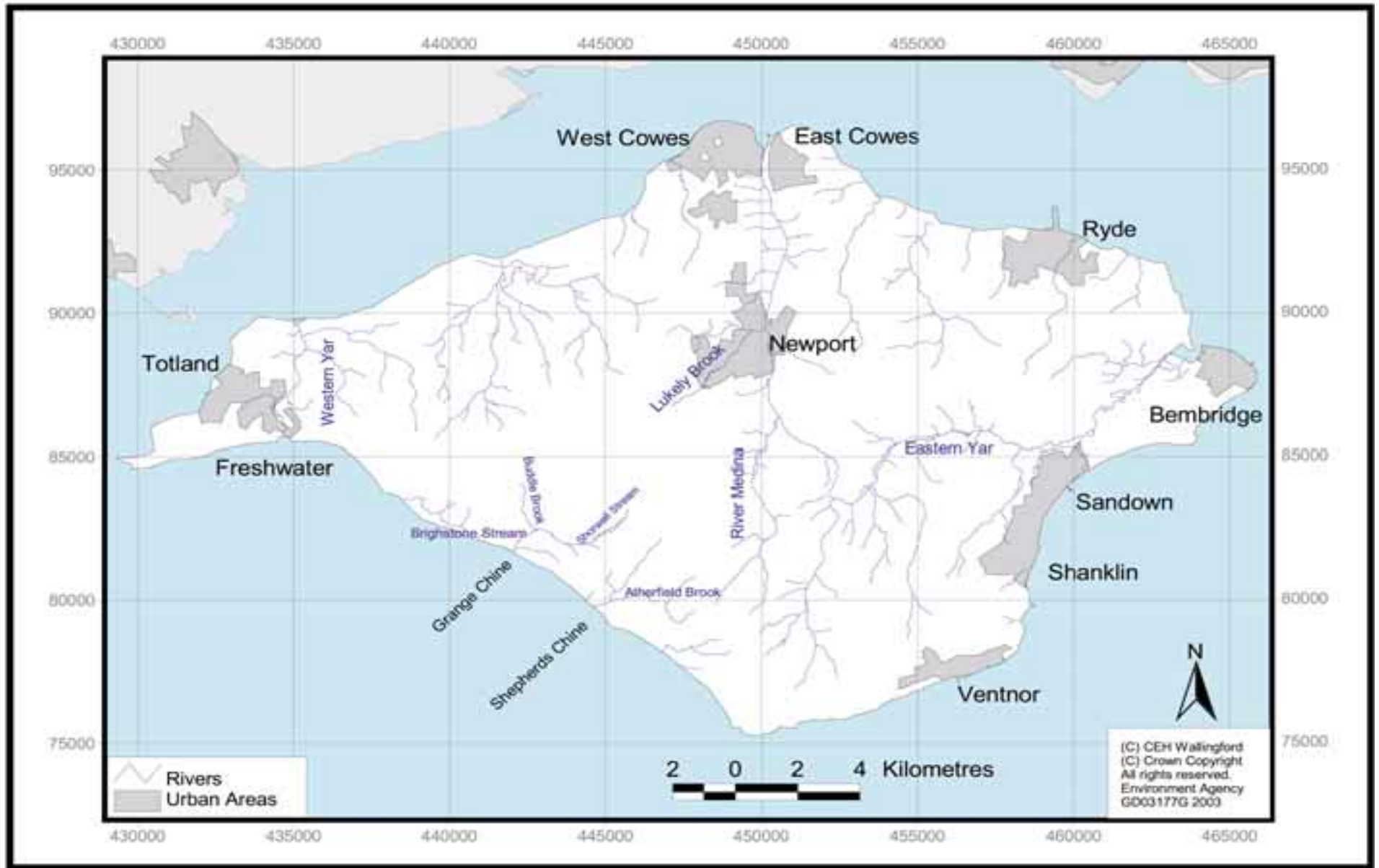


Figure 1 - CAMS Area Overview

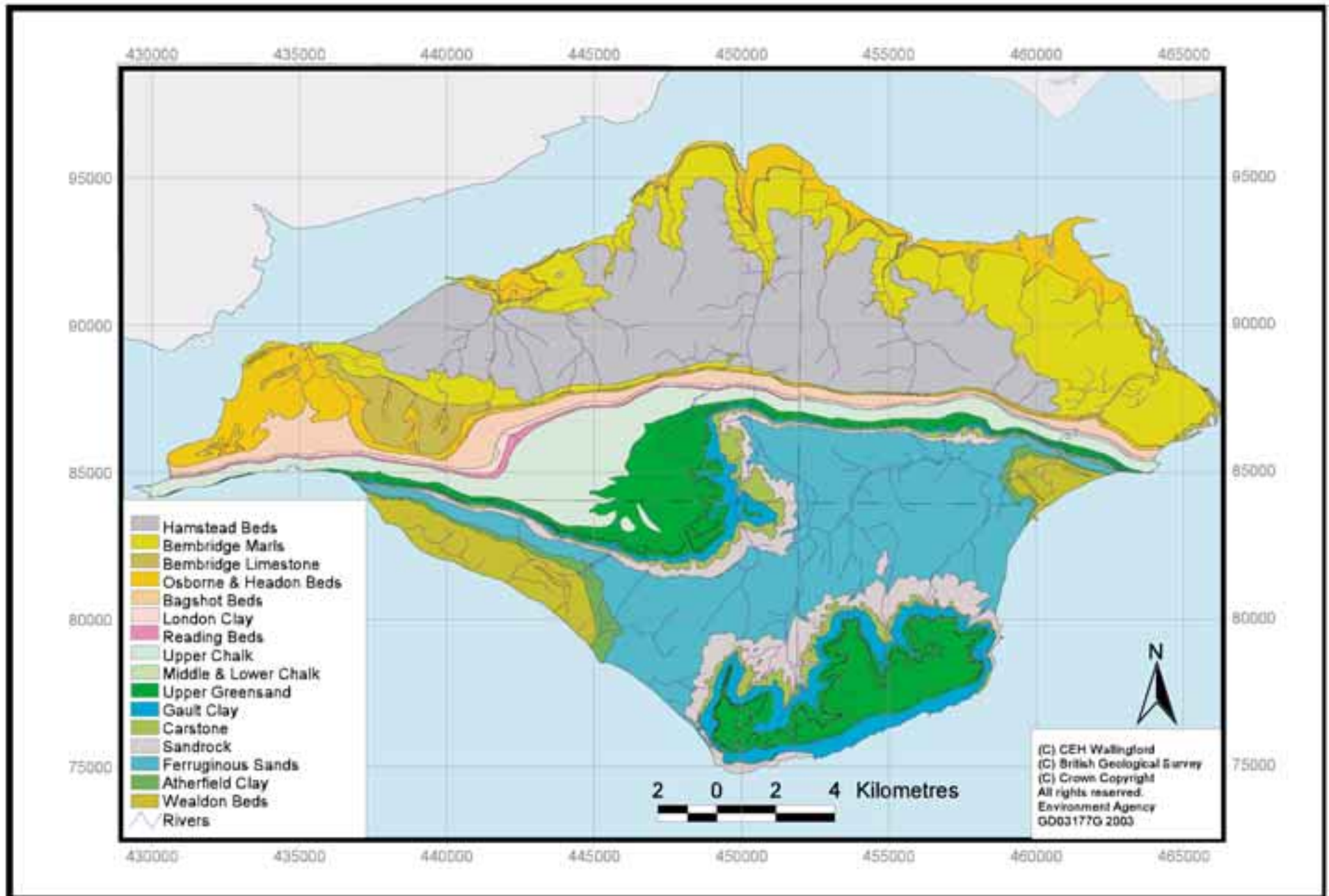


Figure 2 - Geology

In the south of the Island the Shorwell and Buddle streams both rise in the Central Chalk west of Newport before joining and flowing to the sea as the Brightstone Stream through Grange Chine. The two arms of the adjacent Atherfield Brook rise in Lower Greensand and flow through Shepherds Chine to the sea.

Chines are steep sided valleys where the river flows through coastal cliffs to the sea. They are formed by the rapid erosion of soft clays and sands caused by water flowing out towards the sea. Over time the coastline has been continuously eroding and retreating meaning that the distance between the source of the Chines streams and the sea has become progressively shorter. In order to reach sea level the streams have cut down through the soft rock of the cliffs.

The Western Yar in the west of the Island is sourced in the Freshwater Bay area and flows a short distance to the sea at Yarmouth. It was once a river with a well developed system of tributaries, but the erosion of the channel coast has destroyed its upper catchment. The river must once have been one of the largest on the Island but is now no more than a brook with a disproportionately large estuary. The Thorley brook also flows into the Western Yar's estuary.

In the north west the Caul Bourne, Western Haven and Rodge Brook all flow to the sea via Newtown Estuary.

Significant streams in the north east of the Island includes Palmers Brook and Blackbridge Brook which flows into Wootton Pond. The pond is controlled by sluices and suffers from siltation problems.

3.2. Hydrometry



Carisbrooke Gauging Station

Water resources are monitored using a network of hydrometric stations. This data is used on a routine basis for drought and flood monitoring, water resource investigations and has also been used to assess resource availability in this CAMS. Figure 3

shows the locations of gauging stations, raingauges and observation boreholes.

River flow is measured at the gauging stations listed below.

Table 1a | Gauging Stations in the Isle of Wight CAMS Area

Gauging Station	River
Burnt House	Eastern Yar
Budbridge	Eastern Yar
Waightshale	Wroxall Stream
Shide	Medina
Carisbrooke	Lukely Brook
Blackwater Intake	Medina
Atherfield	Atherfield Brook

A number of monthly current meter gaugings are also carried out and these are listed below.

Table 1b | Monthly Current Meter Gaugings in the Isle of Wight CAMS Area

Gauging Site	River
Merstone Stream	Medina
Highwood Lane	Medina
Fiddlesticks	Shorwell Stream
Crown Inn	Shorwell Stream
Shepherds Chine	Atherfield Brook

The Agency has a network of 44 boreholes on the Chalk, Upper Greensand and Lower Greensand which are monitored on a monthly basis. There is a need for further groundwater level monitoring data on the western side of the central Chalk and the south west area of the Lower Greensand.

There are 7 tipping bucket raingauges on the Island with a further 12 water company and other observer raingauges.

In 2002 a climate station recording wind speed and direction, solar energy, air and soil temperature, humidity, air pressure and rainfall was installed at Arreton.

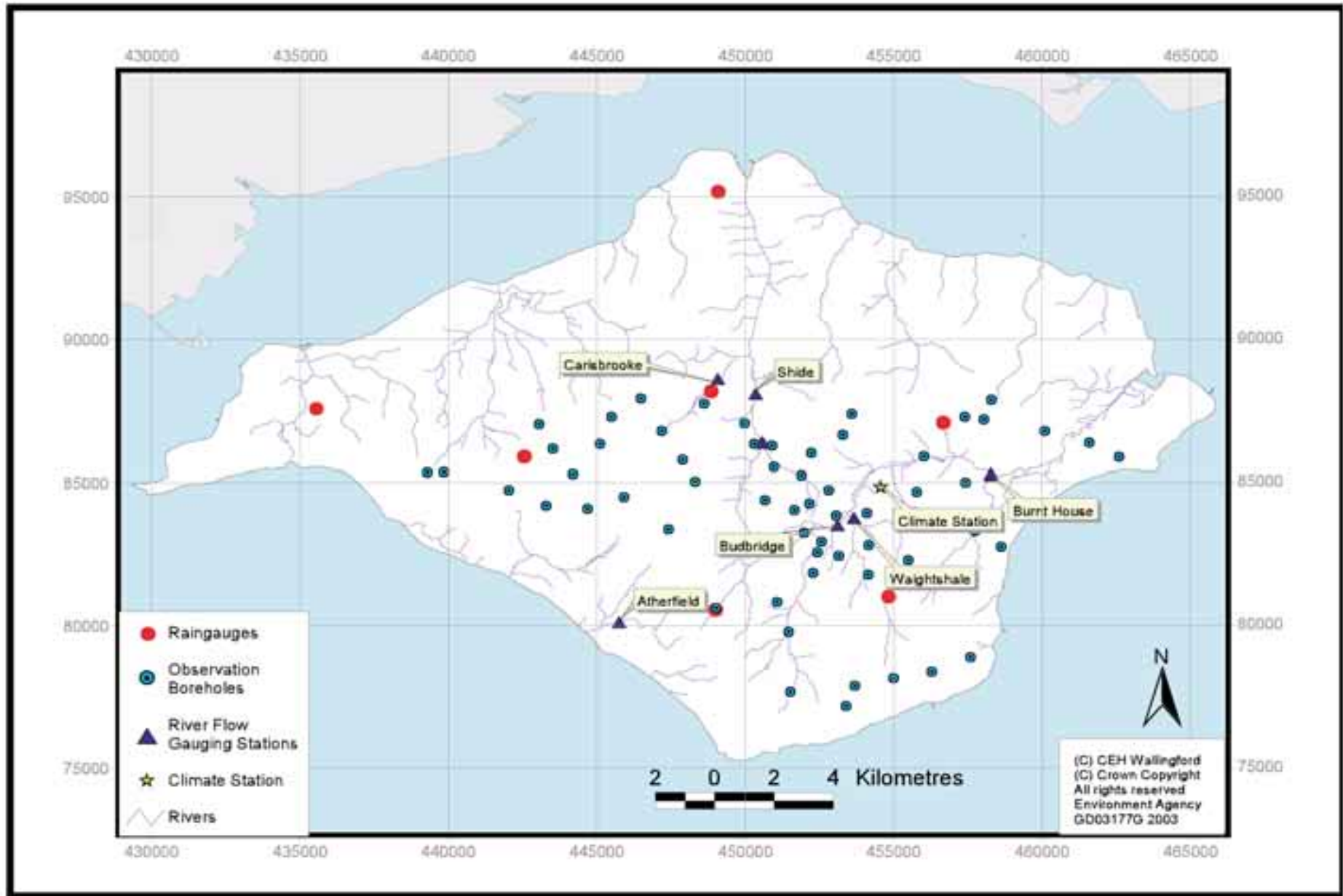


Figure 3 - Hydrometric Sites

3.3. Abstractions and Discharges

The total of licensed water abstraction on the Isle of Wight of about 78 Million Litres per day (Mld) is at present split between 68% groundwater and 32% surface water. Figure 4 shows the location of abstractions in the Isle of Wight CAMS area.

By far the largest proportion of 78% is licensed for Public Water Supply use. This added to that licensed to the water company for augmenting the Eastern Yar, accounts for 87% of the total quantity of Island abstractions.

The Public Water Supply abstraction at Burnt House near Sandown on the Eastern Yar is constrained by a condition that if the flow of the river drops below 1 Mld, then abstraction must cease. In order to continue without breaching this condition, there are two augmentation schemes operated by the water company. The Lower Greensand Groundwater Scheme utilises six boreholes drilled deep into the Lower Greensand. Water from three of these is discharged via ditches to the Eastern Yar upstream of Sandown pumping station. The other three boreholes are located in the Medina catchment with one discharging into the Merstone stream and the other two boreholes discharging directly into a sump at Blackwater. The other scheme is the Medina Yar Transfer Scheme where water abstracted from the Medina is transferred, together with groundwater from the Medina catchment boreholes, from Blackwater to the Eastern Yar.

The Public Water Supply is also dependent upon the import of water from the mainland via an under-sea pipeline which supplies about a quarter the Island's needs.

Of the remainder of abstraction licences, 3% is used for spray irrigation and general agriculture, 4% for fish farming and 6% for industrial and commercial use eg. sand and gravel washing.



Horticultural glasshouses at Hale Common

Currently trickle irrigation, which is used extensively by the Island's thriving horticulture industry to irrigate salad crops, is unlicensed. However this situation will be changing in the near future as the Water Act 2003 requires such abstractions to be licensed. The Environment Agency and Defra are currently defining the process by which this will happen.

Impoundments on rivers are sometimes used to store water for fisheries and spray irrigation.

There are few consented discharges into rivers with the vast majority of effluent being discharged out to sea via the Seaclean Wight scheme at Sandown. Figure 5 shows sewage treatment works and trade discharges including the small waste water treatment works at Wroxall, Shorwell, Roud and Godshill.

3.4. Conservation Designations

Rivers, streams and other wetlands such as coastal and floodplain grazing marshes, ditches, fens, reedbeds, springs, swamps and marshes are of great importance to wildlife. All of these varied wetland habitats are found on the Isle of Wight.

Many of the Island's wetland habitats and some of the species dependent upon them are the subjects of UK Biodiversity Action Plans (BAP). The Agency has a special responsibility to promote the conservation of all wetland wildlife, both the common and the rare, and takes a lead role in co-ordinating the delivery of Government BAP targets for many wetland habitats and species (e.g. Water Vole). The Island supports some of the most important remaining Water Vole populations in the United Kingdom. The rivers and wetlands of the Isle of Wight support an exceptional diversity of wildlife and all of this is dependent on an adequate supply of water.

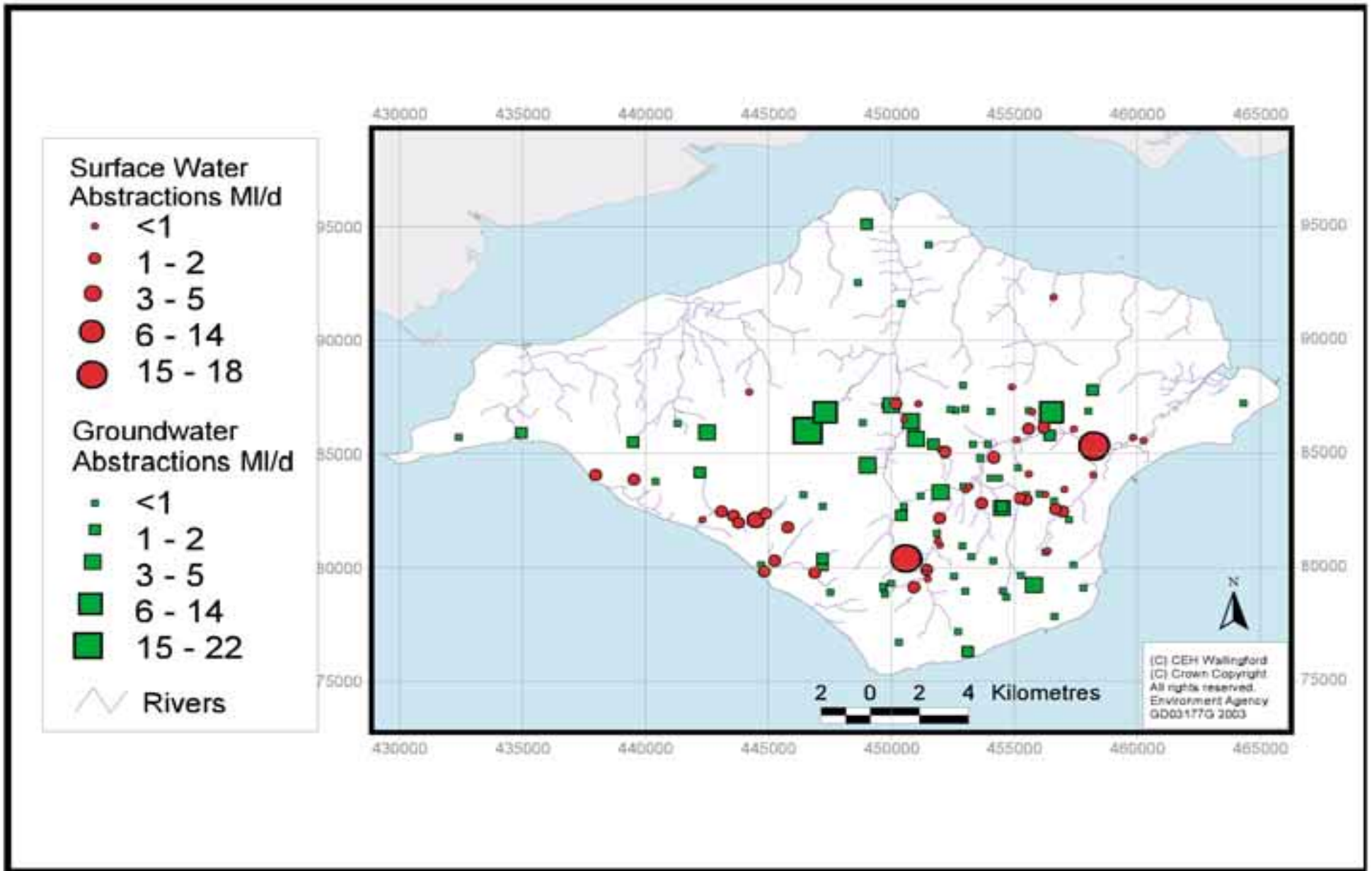


Figure 4 - Licensed Abstractions

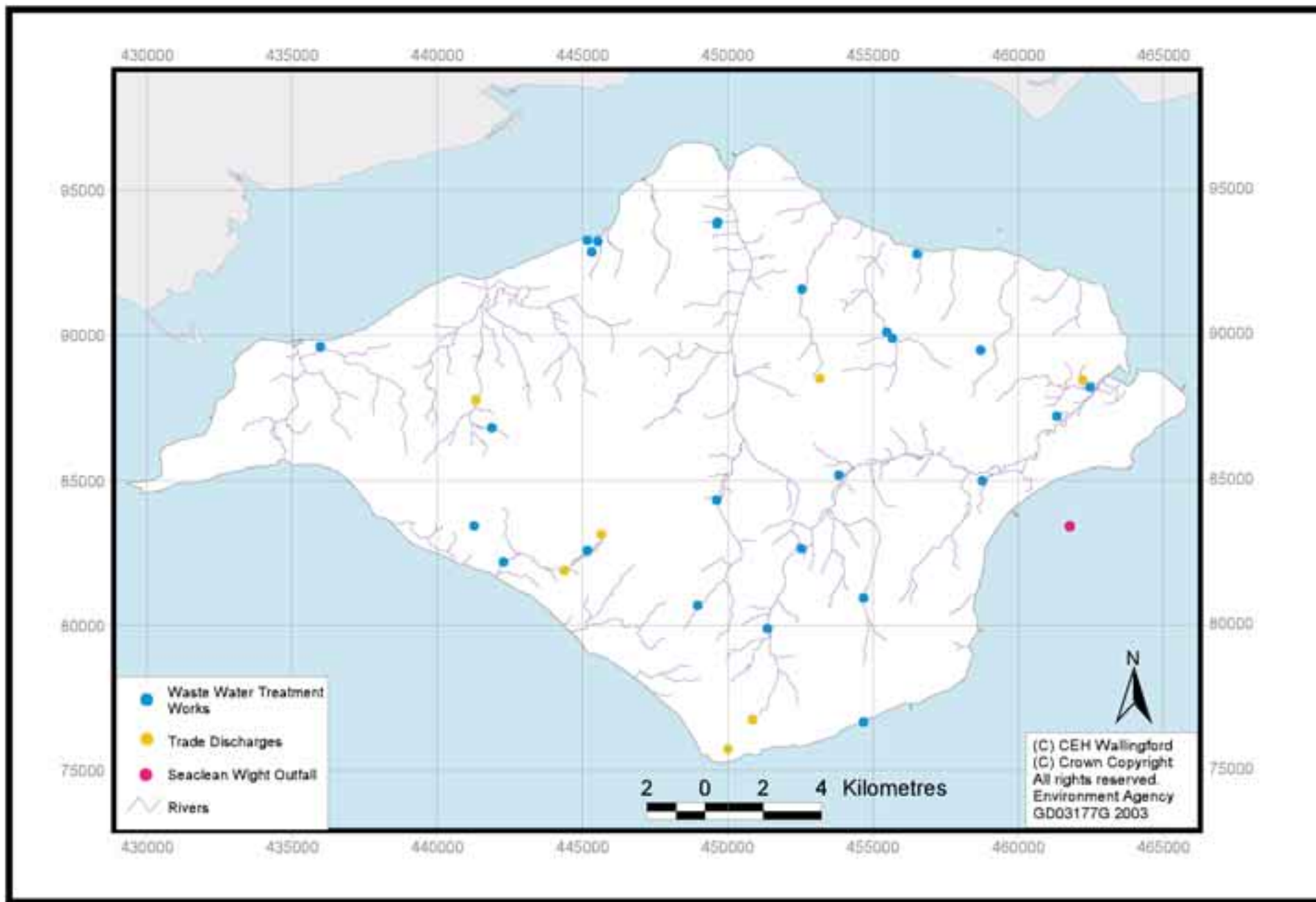


Figure 5 - Consented Discharges of more than 10 cubic metres per day

Figure 6 shows that most of the coastal wetlands of the Isle of Wight are designated under European legislation (Special Area of Conservation(SAC)/Special Protection Area (SPA) sites) and International legislation (Ramsar) wildlife sites, together forming part of the Natura 2000 site network. Above the low water mark these Natura 2000 maritime sites are also Sites of Special Scientific Interest (SSSI). Some of the designated interest of Natura 2000 coastal sites includes associated freshwater habitats, which require the maintenance of favourable flow rates and water levels. The main sites include:

- **South Wight Maritime cSAC** – the vegetated sea cliffs are an interest feature of this site. The cliffs include dramatic canyon-like features known as Chines. The steep, unstable walls of the Chines and the unusually sheltered environment in which they exist support specialist plant and invertebrate communities including species rarely found on the British mainland. The Agency is currently undertaking an investigation to understand how natural and man-induced changes in stream flow rate affect the ongoing erosion processes that give the Chines their special wildlife and landscape interest.
- **Solent and Southampton Water SPA/Ramsar Site** – this site includes much of the north coast of the Isle of Wight incorporating the Medina Estuary and Newtown Harbour as well as Brading Marshes SSSI. This SSSI supports extensive areas of coastal and flood plain grazing marsh, together with smaller areas of marshy grassland, swamp and reed bed. The site is host to large numbers of over-wintering wildfowl. A rich aquatic invertebrate fauna populates the system of ditches and dykes that drain the marshes.
- **Solent Maritime cSAC** – this site includes a large area on the north coast of the Isle of Wight. The Medina Estuary and Newtown Harbour are included within the cSAC. The site is particularly noted for its estuary, inter-tidal mudflats and saltmarsh habitats.
- **Solent and Isle of Wight Lagoons cSAC** – this site includes part of Brading Marshes and is considered to be one of the best areas in the UK for shallow coastal saltwater of varying salinity separated from the sea by sandbanks or shingle. These lagoons have a high species diversity and support several rare lagoonal species.

Other SSSIs associated with riverine habitats on the Island include Cridmore Bog and The Wilderness on the River Medina; Alverstone Marshes SSSI on the Eastern Yar and Freshwater Marshes at the head of the Western Yar Valley.



Lapwing

A significant number of other important freshwater wetland habitats on the Island have been designated through the Unitary Development Plan as non-statutory Sites of Importance for Nature Conservation (SINC).

A large part of the CAMS area is also included in the Isle of Wight Area of Outstanding Natural Beauty (AONB).

3.5 Status of Ecology and Fisheries

3.5.1. Ecology

Ecological quality is assessed at over 20 sites on the Isle of Wight using nationally recognised procedures which can reliably assess the severity and cause of environmental stress.

Over-abstraction and pollution are considered to be the major threats to the ecological quality of freshwater habitats on the Isle of Wight. Many of the Island's small watercourses are affected by natural low flows which can be exacerbated by abstraction. In addition to causing a loss of habitat and encouraging siltation, low flows also affect the amount of dilution afforded to pollutants.

Additionally the middle to lower reaches of the Eastern Yar and Medina suffer from habitat degradation caused primarily by past dredging regimes that have left the rivers relatively uniform in their physical nature. In an attempt to mitigate summer low flows, boards are used to hold up water within these reaches. However this practice further exacerbates the problem since although some depth of water is retained, water velocity is significantly reduced. This in turn reduces habitat diversity and encourages siltation of the substrate. In these conditions aquatic invertebrates adapted to more pond-like conditions are favoured. When flows are restored in the winter and the boards removed, these species are unable to tolerate the fast velocities and in the absence of suitable refuge are swept away leaving a denuded or very sparse riverbed community.

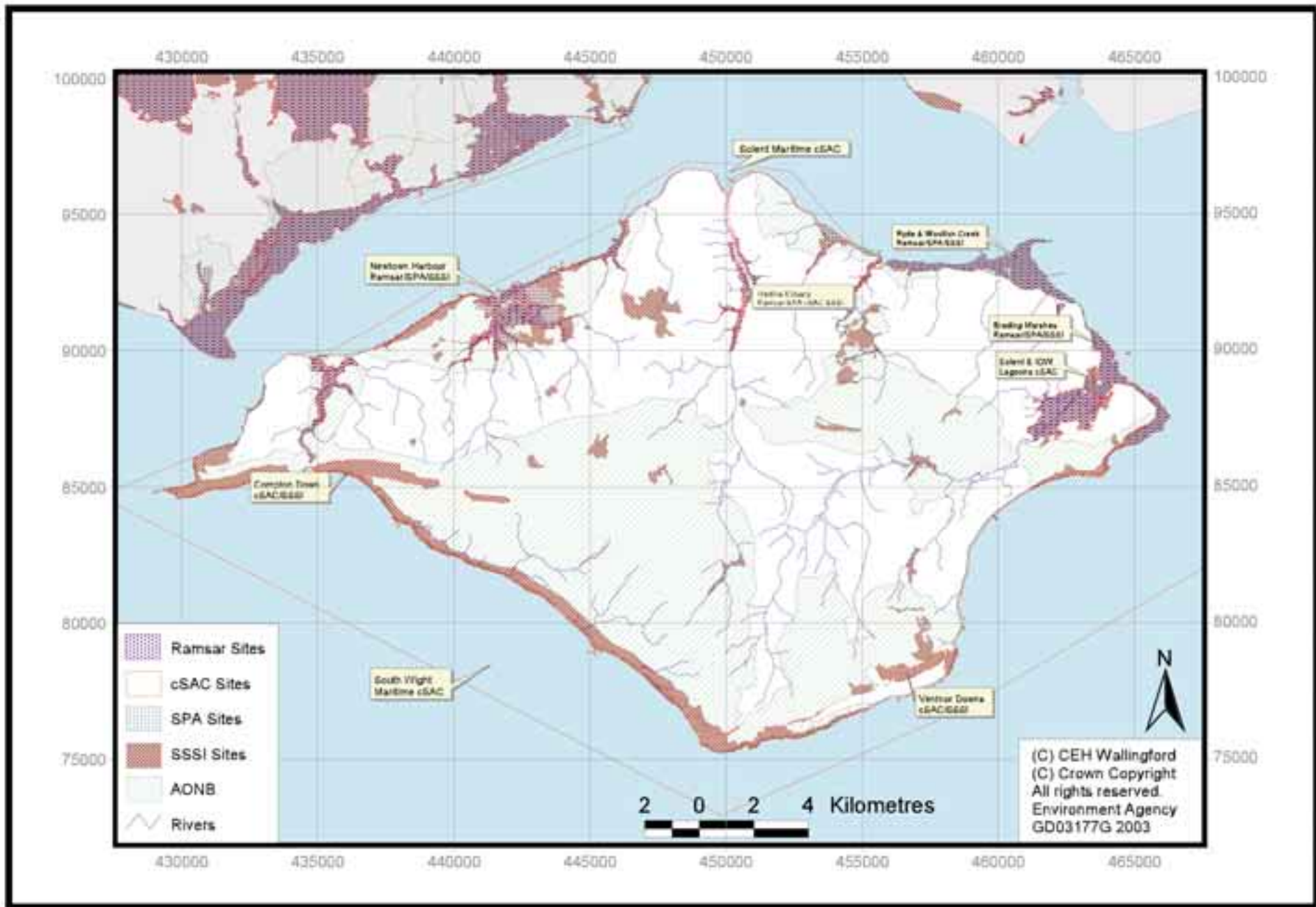


Figure 6 - Designated Conservation Sites

Despite these problems recent invertebrate data shows that, in a national context, the Island's water courses are typically of fairly good ecological quality, although failure to achieve the higher grades show that invertebrate communities are being compromised. Some streams however do show significant damage, namely Palmer's Brook, Rodge Brook, Thorley Brook, and the Arreton and Atherfield Streams. Of these impacted streams, significant abstraction only occurs in the catchment of the Atherfield Brook.

The water management approach of encouraging the building of winter storage reservoirs has offered real opportunities for wildlife and fisheries, although this clearly has to be offset against the impact on terrestrial wildlife and vegetation.

3.5.2. Fisheries

Fisheries survey data for the Isle of Wight is generally sparse and restricted to the rivers Medina and Eastern Yar. The impact of abstraction may be one of several factors that could be restricting the islands fisheries' achieving their true potential particularly in respect of those rivers. Low flows in the rivers at certain times of the year are a major factor in:

- inhibiting fish migration
- increasing the number of physical obstructions to fish
- increasing the concentration of pollutants including siltation deposition
- fish strandings
- increasing the risk of poaching by creating bottlenecks

Local sources suggest that most of the rivers had good populations of wild brown trout and migratory sea trout in the past. Some small streams still have populations of wild trout and migratory salmonids are also present.

The exploited fisheries for the Eastern Yar are predominantly for coarse fish species (eg. roach, perch, carp) and eels, particularly in the lower reaches. However there are characteristic Chalk stream headwater populations of small wild trout. Recent surveys highlight a potential decline in eel abundance and a reduction in the number of brown trout caught. However further investigation into both is necessary to determine whether this is as a result of natural population variability or changing environmental factors.

The fisheries of the River Medina are brown trout and coarse species with populations of small brown trout

in the headwaters. There have been occasional reports of sea trout in the Medina estuary, which appear to be spawning well upstream of Newport. Dace, stone loach, bullhead, eels and sticklebacks are also present.



Bullhead

Local fisheries knowledge provides most of the information regarding the Lukely Brook. This indicates that sea trout and brown trout use the stream.

There is very limited information available for Grange and Shepherds Chine. Grange Chine is known however to have populations of Brown Trout whereas Shepherds Chine has little or no fish community.

It is clear that comprehensive investigations are required into many of the Island's streams before the review of this CAMS in 2008.

3.6. Water Quality

To assess surface water quality on the Isle of Wight there is a network of 20 sampling points covering 87.5km of classified river. Routine monitoring of these has shown that surface water quality is generally of average quality with some stretches of river showing poor overall quality. In particular intensive horticulture and mixed farming practices have resulted in elevated pesticide concentration and siltation being observed in the Eastern Yar catchment. Water abstraction and low river flows can exacerbate these problems. Making water quality improvements and meeting future water quality objectives rely partly on sufficient flows being available.

The issue of groundwater protection is important as a significant proportion of the Island's public water supply is abstracted from groundwater sources. There are Nitrate Vulnerable Zones (NVZ) covering most of the Chalk and Lower Greensand areas. The groundwater in the Lower Greensand is naturally iron rich but Chalk groundwater quality is generally good, although there are nitrate and pesticide problems at

some sources due to the predominantly arable land use. Minor aquifer groundwater quality also tends to be good although naturally elevated iron and manganese concentrations occur in some waters.

The Agency has a groundwater protection policy designed to afford the highest protection to aquifers supplying potable abstractions. If public water supply sources are affected by pollution, alternative sources have to be used either in the short or long-term. Therefore groundwater quality can affect water resources. The Agency will continue to apply the groundwater protection policy and investigate where groundwater pollution is suspected. Successful campaigns have identified potentially polluting activities in vulnerable areas where advice has been targeted.

3.7. Stakeholder Concerns

The Isle of Wight Stakeholder Group members have played a valuable role in providing local information and views from their various areas of broad interest relating to water resources. They have been fully briefed at all key stages during the development of the CAMS process and have raised and debated many important issues in relation to the Island's future. Some of the main issues discussed are as follows:

- Realistic feasibility of Island self-sufficiency in public water supply
- Environmental impacts of abstraction on wetlands maintenance and creation
- The effect of CAMS on trickle irrigators following the new Water Act
- Use of winter storage by public water undertaker
- Future housing development pressures on public water supply
- Concern about revocation of little used licences which may have been infrequently used for weather or crop rotation reasons
- Water quantity requirements of Brading Marshes and Alverstone Marshes
- The effect of public water supply pumping at Shalcombe
- Environmental impacts on Plaish Meadows and Lukely Brook
- The use of winter storage reservoirs by farmers



Storage reservoir at Atherfield

3.8. Links with Other Plans

Developing links with other plans will ensure that other groups consider water resources issues. In addition to the obvious links with the regional and national water resources strategies, CAMS will be linked to other agency plans such as:

- Eastern Yar Fluvial & Coastal Strategy Plan
- Water Level Management Plans
- Catchment Flood Management Plans
- Water Quality Improvement Plans
- Fisheries Action Plans
- National and local IOW Biodiversity Action Plans
- Water Company Asset Management Plans

Where possible links should also be encouraged with plans produced by external groups eg. Regional and Local Development Plans and AONB Management Plans.

Resource assessment and resource availability status

4.1. Introduction

To manage water resources effectively, we need to understand how much water is available and where it is located. This is achieved by undertaking a resource assessment, covering both surface water and groundwater.

Water is used for a number of different purposes, the principal categories being general agriculture, trickle and spray irrigation, industrial use, power generation and public water supply. For each different use, the amount of water that is returned to the water environment close to where the water was abstracted may vary considerably. Where this loss is high, the Agency considers the abstraction to be consumptive. This may restrict the availability of water for these purposes, unless a significant proportion of the water abstracted is returned to the water source close to the point of abstraction.

To easily provide information on the availability of water resources within a catchment that may be used

for consumptive purposes, a classification system has been developed. This “resource availability status” indicates the relative balance between committed and available resources, showing whether licences are likely to be available and highlighting the areas where abstraction needs to be reduced. This does not replace the need for licence determination process which is applied to licence applications. More information on the determination process is given in Annex Two of Managing Water Abstraction.

There are four categories of resource availability status, as shown in Table 2.

So that water resources are assessed consistently in similar situations, a framework for resource assessment and management to be applied in all CAMS areas has been developed.

This framework involves the development of an understanding of the water resources of the CAMS area and assessment of the surface water and groundwater resource. These results are integrated to define the final resource availability status of different units within the CAMS area.

Table 2 | Resource availability status categories

Indicative resource availability status	Definition	Colour Coding for illustration on maps
Water available	Water likely to be available at all flows including low flows. Restrictions may apply.	Blue
No water available	No water available for further licensing at low flows although water may be available at higher flows with appropriate restrictions.	Yellow
Over-licensed	Current actual abstraction is resulting in no water available at low flows. If existing licences were used to their full allocation they would have the potential to cause unacceptable environmental impact at low flows. Water may be available at high flows with appropriate restrictions.	Orange
Over-abstracted	Existing abstraction is causing unacceptable environmental impact at low flows. Water may still be available at high flows with appropriate restrictions.	Red

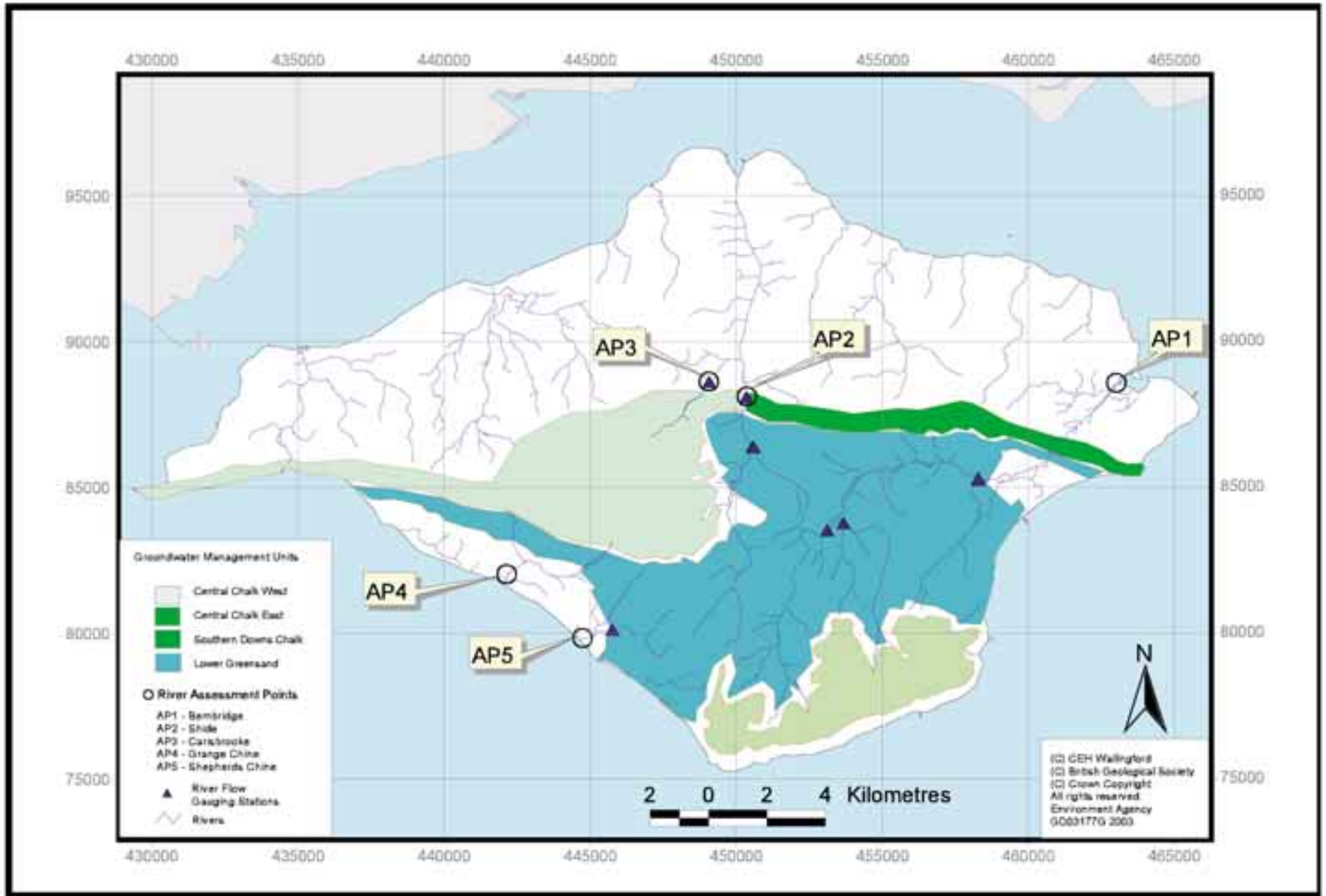


Figure 7 - Groundwater Management Units and River Assessment Points

Within and between catchments there are variations in characteristics. In order to measure, manage and regulate effectively, we need to break catchments down into smaller areas, recognising similarities in characteristics. In the resource assessment for CAMS, in areas where groundwater resources are significant, groundwater management units (GWMUs) are defined. For surface water, “assessment points” (APs) are located on the river network. These river APs and GWMUs are the focus of resource assessment and abstraction licensing.

Figure 7 shows the GWMUs and river APs that have been defined for the Isle of Wight CAMS. Further details on how these were defined are provided in the technical document for the Isle of Wight CAMS.

4.2. Resource assessment of groundwater management units

For the groundwater resource assessment, various tests are applied to each unit to determine the resource availability status. These tests include examining the balance between recharge to the unit and abstraction from it, and the impact of abstraction on summer outflows from the unit.

4.3. Resource assessment of river assessment points

The surface water resource assessment requires the definition of “river flow objectives”. These are based on the sensitivity of the local ecology to flow variations (i.e. their vulnerability to abstraction impacts). It also takes account of other flow needs. These objectives represent the minimum flow that we are aiming to protect. This then affects the amount of water that is available for abstraction.

These river flow objectives are developed by first giving “environmental weighting” scores to the

reaches, which represent the sensitivity of the river reach to abstraction. Reaches are banded VH (very high) through H, M, L to VL (very low), VH being most sensitive to abstraction and VL being the least sensitive.

The resulting river flow objectives are then compared with a scenario flow which assumes that all licences are being fully utilised (i.e. the full licensed quantity is being abstracted). This comparison reveals either a surplus, balance or deficit. The size of the surplus/deficit corresponds to a resource availability status for the unit.



Eastern Yar assessment point near Bembridge

The surface water resource availability classification gives an indication of whether new licences will be available from the river or whether some recovery of resources is required. However, there are significant variations in flow throughout the year. A classification of “over-licensed” or “over-abstracted” generally indicates that no new licences will be granted. However, this applies only at times of low flow. During periods when flows are higher, there may be some water available for abstraction. The classification is therefore really a classification of resource availability at low flow.

In order to ensure this flow variability is maintained, abstraction licences are sometimes managed by the use of “hands-off flow” conditions. These are conditions on licences that require abstraction to cease (or reduce) when the flow in the river falls

Table 3 | shows the environmental weighting scores for each river.

Assessment Point	Assessment Point Name	River	Environmental Weighting Score
1	Bembridge	Eastern Yar	Medium
2	Shide	Medina	Medium
3	Carisbrooke	Lukely Brook	Medium
4	Grange Chine	Brighstone Stream	Medium
5	Shepherds Chine	Atherfield Brook	High

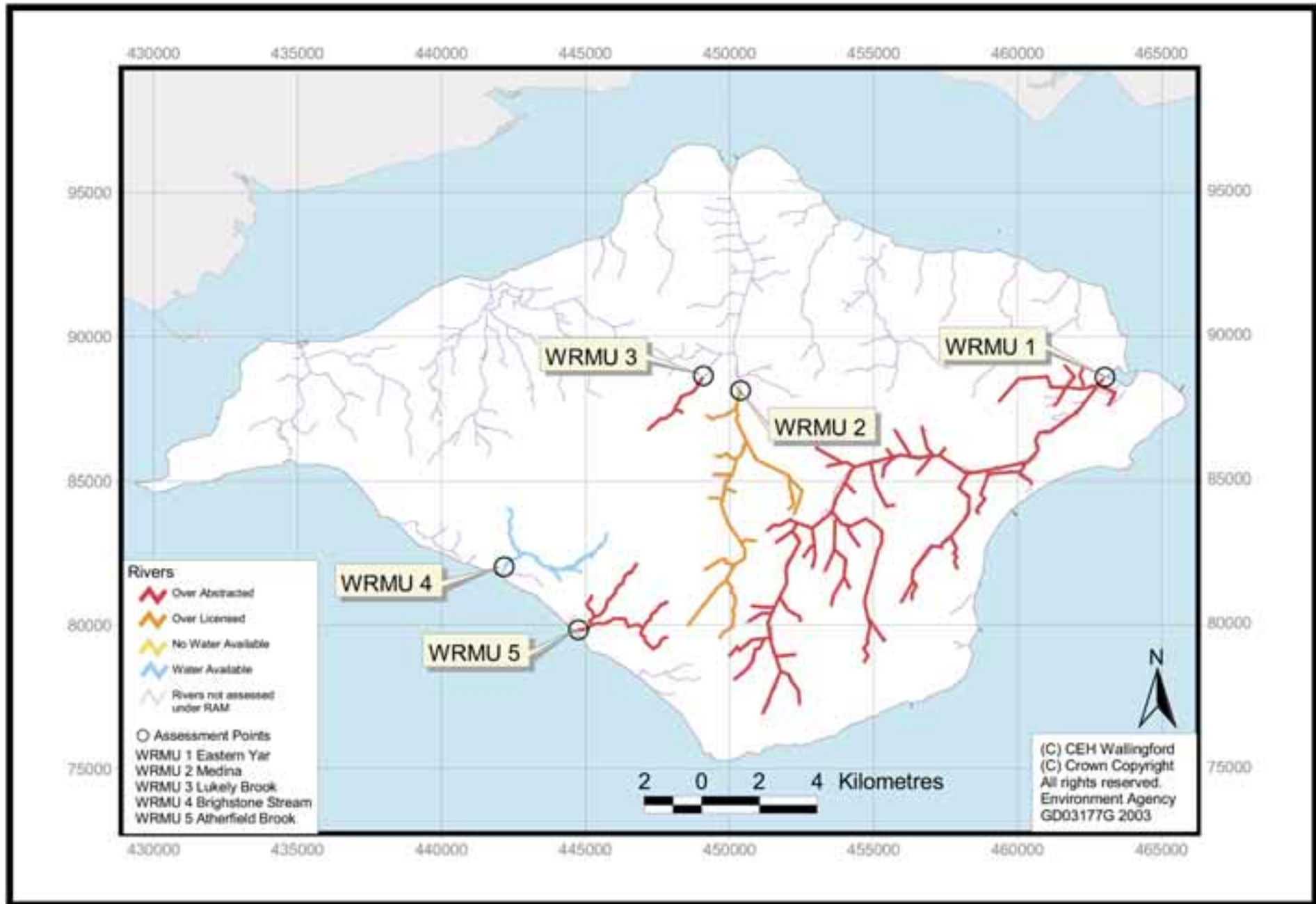


Figure 8 - Water Resource Management Units (Surface Water)

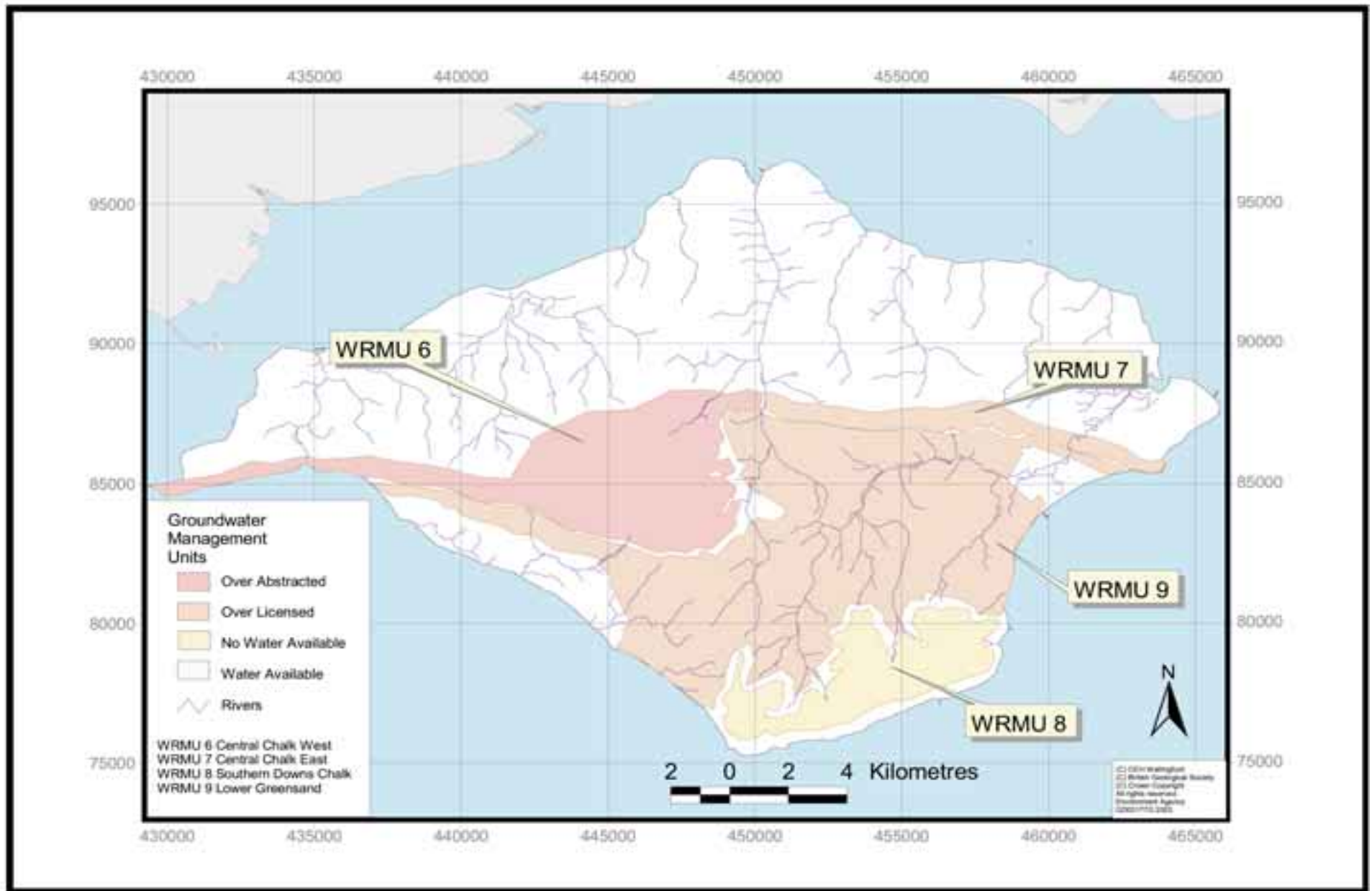


Figure 9 - Water Resource Management Units (Groundwater)

below a specified level. Therefore, when river flows are above this hands-off flow, abstraction can take place but when flows are below this, no abstraction (or reduced abstraction) can occur. Low flows will occur more frequently during the summer months.

In order to maximise abstraction while maintaining the variability of flow (required for many aquatic species), a tiered system of hands-off flows is applied. Licences are generally granted with the lowest hands-off flow possible on a first-come-first-served basis. As more licences are granted, the hands-off flow must be increased to maintain sustainable flows in the river.

For potential applicants for new abstraction licences, it is therefore important to know not only the likelihood of obtaining a licence, but also the reliability of a licence if granted with a hands-off flow condition. Within the CAMS resource assessment, reliability is expressed as a percentage. This percentage indicates the minimum amount of time over the long term that the scenario flow exceeds the river flow objective, therefore allowing abstraction to take place.

The resource assessments for both surface water and groundwater use a scenario which assumes that all licences are being fully utilised; that is, the full authorised volume is being abstracted. However, many licences are not used fully and therefore in reality the resource availability can be different. If the result of a resource assessment is “over-licensed”, data of actual abstraction is then used to establish whether the status is “over-abstracted” (actual flows are lower than river flow objectives). “Over-abstracted” represents abstraction that is already unsustainable whereas “over-licensed” represents the potential for damage should the full licensed amount be abstracted.

4.4. Integration of the surface water and groundwater resource assessments

In most CAMS areas the surface water Assessment Points and the Groundwater Management Units are combined to form a series of Water Resource Management Units (WRMUs) with a final water Resource Availability Status (RAS). However the Isle of Wight river network and aquifer units do not fit neatly together. For example, the Eastern Yar flows over three of the groundwater management units, namely the Southern Downs Chalk, the Lower Greensand and the Central Chalk east of Newport. This makes the integration of surface catchments with groundwater units very difficult.

Although the interaction between surface and groundwater units was assessed, that interaction is complex and therefore the units were kept separate. The results of the assessment showing the Resource Availability Status for each of the surface water assessment points (APs) and groundwater management units (GWMUs) are shown in Figures 8 and 9 respectively. All APs and GWMUs are from hereon termed Water Resource Management Units (WRMUs).

4.5. Water Resource Management Units (WRMU's) in the Isle of Wight CAMS

The Isle of Wight CAMS has nine Water Resource Management Units (WRMUs). These units include all the major abstractions in the area.

4.5.1. Water Resource Management Unit 1 – Eastern Yar (Surface Water)



Eastern Yar from the sluice gates at Bembridge

The Eastern Yar rises from springs in the Southern Downs Chalk at Niton and flows for most of its length across the Lower Greensand, cutting through the Central Chalk at Brading, before entering the sea at Bembridge. The unit covers an area of some 89km² and includes the main tributaries of the Arreton Stream, Wroxall Stream and Scotchells Brook. The assessment point is at Bembridge which is downstream of the gauging station at Burnt House. Flow statistics were calculated for this unit which introduces some uncertainty.

There are significant water demands from the major public water supply surface source at Burnt House near Sandown and groundwater source at Knighton. Augmentation schemes are used to maintain the Burnt House abstraction without breaching the flow condition of 1 Ml/d which is designed to maintain flows in the Eastern Yar. This utilises groundwater from boreholes in this unit and surface and groundwater within the adjoining Medina unit.

The majority of the area is dominated by intensive agriculture with its associated water requirements delivered by spray irrigation. Horticulture is also important, with several hectares of glasshouses largely supplied with water for currently unlicensed trickle irrigation. This form of abstraction will become licensable in the future and is likely to be a source of serious debate.

Of major environmental significance in the area is the wetland SSSI at Brading Marshes, parts of which are designated under the European Habitats and Birds Directives as both candidate Special Area of Conservation (cSAC) and Special Protection Area (SPA)/Ramsar sites. The Brading Marshes Water Level Management Plan (WLMP) states that water levels in the marshes need to be raised to bring the site into favourable condition. To do this the RSPB, who own and manage part of the site, propose raising water levels to encourage habitats for wetland birds. The impact of upstream abstractions on the site is currently being assessed under the Habitats Directive Review of Consents and the issues of flow requirements, water retention and flooding are the subject of ongoing studies and discussions between the Environment Agency, English Nature, RSPB and other interested parties. There are also several other water dependant designated and non-designated sites including Alverstone Marshes.

There are uncertainties related to the assessment of water resource availability as the flow statistics are estimated, for an ungauged location at Bembridge, and the environmental impact of abstraction is not known. Despite these uncertainties, it is clear that the unit is heavily abstracted. Even abstractions to support environmental enhancements must be very carefully considered in this context. The water resource requirements of wetlands has not been calculated in this unit and is a subject which needs further work.

This unit is assessed as “Over-abstracted”

4.5.2. Water Resource Management Unit 2 – Medina (Surface Water)



River Medina near Newport

The River Medina rises from springs in the Southern Downs Chalk near Chale and flows north over the Lower Greensand, bisecting the Central Chalk at Newport before discharging into the Solent at Cowes. The unit includes the Merstone stream tributary but excludes the Lukely Brook which, due to differing environmental issues, has been treated as a separate unit. The assessment point is located at the gauging station at Shide.

Public water supply again predominates in this catchment with a groundwater source at Chillerton. However the major licensed abstractions in the unit are from the boreholes and surface abstraction that comprise the Medina/Yar augmentation scheme. The actual water abstracted for this scheme is typically significantly below the quantities for which it is licensed, which is largely the reason for the “Over-licensed” status of this unit.

The majority of non-public water supply licensed abstractions in the unit are for spray irrigation, servicing the needs of the intensive agriculture which is extensive in the area.

Cridmore Bog, The Wilderness and Shide Quarry are the main SSSIs likely to be water dependent within the unit. Although the Medina Estuary SSSI, which is part of the Solent Maritime cSAC and Solent & Southampton Water SPA & Ramsar sites, lies just outside the unit it may however benefit from freshwater flows from the River Medina and Lukely Brook.

This unit is assessed as “Over-licensed”

4.5.3. Water Resource Management Unit 3 – Lukely Brook (Surface Water)



Plaish Meadows

The Lukely Brook is a tributary of the River Medina. It rises on the central Chalk downs west of Newport and flows over outcropping Chalk through Carisbrooke before picking up flow from the Gunville Stream and joining the head of the Medina estuary in the centre of Newport. An area of 15km² is covered and includes that part of the Chalk stream from its source to the Carisbrooke gauging station approximately 2km upstream of the confluence with the Medina where the Assessment Point is located. The only licensed abstractions in this unit are for public water supply from groundwater at Carisbrooke and Bowcombe, sources that are of great importance to the water company.

Although there are no statutory environmental sites within the unit, Plaish Meadows and the brook itself are locally important Sites of Interest to Nature Conservation (SINC's). The brook suffers from low flows in the summer and concerns were raised by respondees to the awareness campaign, as to the possible effect on the stream and wetlands of the Bowcombe Valley. It is however unclear whether this is having any adverse effect on the biodiversity of these sites. Like the Medina, the Lukely Brook also provides important freshwater flows to the Medina Estuary.

This unit is assessed as "Over-abstracted"

4.5.4. Water Resource Management Unit 4 – Brighstone Stream (Surface Water)

This unit covers an area of 12km² and includes the Buddle and Shorwell Streams. Both rise from the central Chalk and flow across the Lower Greensand before joining to form the Brighstone Stream on the Wealden beds and flowing through Grange Chine into the sea. The AP is located to the south of the Military road in the chine itself.

There is a public water supply groundwater source at

the head of the Buddle Stream at Buddle Hole which is currently not used.

The area is intensively farmed with the majority of licensed abstraction being restricted to the winter to store water for summer spray irrigation.

The chine itself is part of the South Wight Maritime candidate Special Area of Conservation (cSAC) and Compton Chine to Steephill Cove SSSI. It is unclear what impact abstraction is having on its shaping, a matter which is the subject of a continuing study into its possible effects.

There is little hydrometric and environmental monitoring in this unit at present which results in a degree of uncertainty in respect of the assessment.

This unit is assessed as "Water Available"

4.5.5 Water Resource Management Unit 5 – Atherfield Brook (Surface Water)

This unit covers an area of 10km² and includes both arms of the Atherfield Brook, which rise from springs in the Lower Greensand, joining just north of Shepherds Chine before flowing through that chine to the sea.



Intensive farming near Yafford

The area is intensively farmed with the majority of licensed abstraction being for the purpose of spray irrigation. One of the largest spray irrigation abstractions on the Island is currently located within the unit, where surface water is abstracted from behind a concrete impoundment on the chine itself.

The chine is part of the South Wight Maritime candidate Special Area of Conservation (cSAC) and Compton Chine to Steephill Cove SSSI. It is unclear as to what impact abstraction is having on its shaping which the subject of a continuing study into its possible effects.

There is little hydrometric and environmental monitoring in this unit at present which results in a degree of uncertainty in respect of the assessment.

This unit is assessed as "Over-abstracted"

4.5.6. Water Resource Management Unit 6 – Central Chalk West (Groundwater)

This unit includes all of the outcropping Chalk and the underlying Upper Greensand forming the central ridge west of Newport covering an area of 40.1km². It provides baseflow to the Lukely Brook and Caul Bourne and to some degree the Shorwell and Buddle Streams in the south of the Island.



Western Chalk toward Freshwater

The major abstractions are for Public Water Supply and include the groundwater sources at Bowcombe, Carisbrooke, Calbourne, Shalcombe and Chillerton. There are also a few small groundwater abstractions in the unit for largely non-consumptive agricultural purposes.

Most of the of the SSSIs within the unit are not water dependent, although the Habitats Directive sites at Grange Chine, Medina Estuary and Newtown Estuary are supplied by groundwater fed streams which gain flow from this unit.

This unit is assessed as “Over-abstracted”

4.5.7. Water Resource Management Unit 7 – Central Chalk East (Groundwater)

This unit consists of a narrow strip of outcropping Chalk covering an area of 9.3km² to the east of Newport to Culver Down. It may provide some of the baseflow of the River Medina and some spring flow to tributaries of the Eastern Yar.

There are two public water supply groundwater sources at Knighton and Ashley and some small licences for agricultural purposes.

There are several SSSIs within the unit at Arretton Down, Eaglehead and Bloodstone Copse but none of those are thought to be particularly water dependent. Shide Quarry SSSI may be water dependent. There are a number of cSACs, SPAs and SSSIs in the Medina and Eastern Yar units which may be indirectly affected by this unit.

This unit is assessed as “Over-licensed”

4.5.8. Water Resource Management Unit 8 – Southern Downs Chalk (Groundwater)

This unit consists of outcropping Chalk and the underlying Upper Greensand covering an area of 19.8km² in the south of the Island between Shanklin and Chale. It provides a significant proportion of the baseflow to the Eastern Yar and to a lesser degree the Medina. Seepages arising from the Upper Greensand contribute to landslips along the south coast.

Public water supplies account for 98% of total licensed abstraction in the unit from five sources, by far the largest of which is Ventnor. The remainder of licensed abstraction is for general agricultural use and a brewery.

The Southern Downs unit has the potential to directly impact the South Wight Maritime cSAC constituent Bonchurch Landslips and Compton Chine to Steephill Cove SSSI. It also includes Greatwood & Cliff Copses, Rew Down, St.Lawrence Bank and Ventnor Downs SSSIs.

This unit is assessed as “No Water Available”

4.5.9. Water Resource Management Unit 9 – Lower Greensand (Groundwater)

This unit comprises a thick series of sands and clays outcropping between the central and southern Chalk. It covers an area of 92.9km² and is the largest of the groundwater units.

The unit contributes significantly to the baseflows of the rivers Eastern Yar and Medina, Shorwell and Brighstone Streams and both arms of the Atherfield Brook. Knowledge of how the aquifer actually works is incomplete due to the complex nature of its layering, both vertically and laterally. This makes accurate prediction of abstraction impacts very difficult.

Over a third of all licensed abstraction in this unit is for public water supply from the Knighton groundwater source and nearly a half for the Eastern Yar augmentation scheme. The remaining 15% of licensed abstraction is for spray irrigation and agricultural use with a small quantity used in connection with mineral extraction. Added to this are the currently unlicensed trickle irrigation abstractions used by the horticultural industry in the Arreton Valley, which are equivalent to 5% of the unit's total licensed quantity.



Spray irrigation on the Island

The unit potentially impacts either directly or indirectly on most of the water dependent cSAC's, SPA's and SSSI's mentioned in the previous Eastern Yar, Medina, Grange Chine and Shepherds Chine units.

This unit is assessed as "Over-licensed"

4.5.10. Areas which are not in Water Resource Management Units

No Resource Assessment and Management (RAM) analysis was completed on northern areas of the Island as very little data is available and there are very few abstractions. The area includes the Western Yar, Newtown Creek, Caul Bourne, Rodge Brook, Palmers Brook, Blackbridge Brook and Monktonmead Brook surface waters and the tertiary deposits, which are a minor or non-aquifer. Although these streams have not been assessed, some of the groundwater units which help to support them have been assessed.

It should be remembered that although CAMS will outline the general licensing policy, every new application and variation for abstraction will be assessed on its own merits.

4.5.11. Further Data needed before next CAMS

The Isle of Wight CAMS will be reviewed in 2008. If that round of CAMS is to substantiate the over abstracted status of units and consider appropriate remedial options, it is very important that more data, especially in respect of river flow, biology and fisheries; is collected. Groundwater modelling will also be required to obtain a better understanding as to the mechanics of the Chalk blocks, particularly with regard to the spring outflow. The results of studies into the affects of abstraction on chines and the quantities of water required by Brading Marshes should also be available.

Licensing strategy

5.1. Sustainability appraisal

5.1.1. Introduction

A sustainability appraisal process has been developed to enable the Agency to take account of costs and benefits in the production of CAMS. The process considers the government's four objectives of sustainable development, relating to environment, economics, society and resource use. It uses a largely qualitative, proforma-based approach to consider what the resource availability status for each water resource management unit should or could be after each six-year cycle (Tier 1). This is undertaken for all units in all CAMS areas. It also allows the appraisal of options for recovering water resources, by taking into account the implications of different options on all aspects of sustainability (Tier 2). This is undertaken to determine the most sustainable options for the future management of the catchment including, where necessary options for recovery of resources. More information on the sustainability appraisal process is provided in *Managing Water Abstraction: The Catchment Abstraction Management Strategy Process*.

5.2. Licensing Strategy Development

Licensing policies were adopted on the Isle of Wight in the 1980s following development of the river augmentation schemes. They have since been influenced by national and regional water resources strategies, LEAPS and soon by changes under the Water Act 2003.

The following sections give a brief overview of these strategies and plans providing a background for the policies detailed within the document.

5.2.1. National Environment Agency Strategies

The Environment Agency published National and Regional Water Resources Strategies in March 2001. The National Strategy defines the framework for abstraction licensing at a high level. In addition to

the National Strategy, there are also national Agency initiatives which have implications for the Isle of Wight CAMS.

The European Union Habitats and Birds Directive requires the Agency to assess the impact of existing abstraction licences on internationally important conservation sites designated as Special Areas of Conservation, Ramsar sites or Special Protection Areas. The Isle of Wight has several internationally important sites and a large number of existing abstraction licences are being assessed to determine the impact they have on these sites.

The following sites are being investigated :

- South Wight Maritime cSAC
- Solent and Isle of Wight Lagoons cSAC
- Solent Maritime cSAC
- Solent & Southampton Water SPA



Brading Marshes

Investigations are currently underway for most of these sites. These investigations will determine if licences need to be amended in any way. The work will also provide better information on which to base future water resource availability assessments.

5.2.2. Southern Region Water Resources Strategy

In March 2001 the Environment Agency published the document 'Water resources for the future' which set down a strategy for the Southern Region. The strategy identifies a preferred approach to meet demand for water whilst protecting the environment for the next 25 years. Assumptions are made about the potential development of new resources, the realistic potential for savings in forecast water use and the cut backs required to maintain or restore sustainable abstraction in some areas. Key principles underlying the regional strategy include:

- Promoting efficient water use by industry, commerce, agriculture and in the home.
- Making best use of available water resources before developing new schemes.
- Taking account of the potential impact of climate change.
- Requiring water companies to explore the economic and environmental benefits of leakage control, metering and water efficiency measures, with all licence applications.
- Refusing new abstraction or impoundment licences to companies with poor leakage or water efficiency statistics and activity.
- Encouragement of water company bulk transfers and sharing of resources between areas of surplus and deficit and other increased "integration", providing there are no adverse effects.
- The Public Water Supply of the Isle of Wight is currently supported by a transfer of up to 13 Ml/d from the Mainland. This is currently expected to remain a key element of the Island's water supply.



Domestic Water Meter

As public water supply is a major abstraction, this is considered in detail but the strategy also considers other water users such as agriculture and industry. Total abstraction by local water companies has declined over recent years as a result of leakage control and a reduction in demand from industry. However in response to an increase in house building and changes in house occupancy rates the water companies expect demand to start rising again. In 1989/90 over 51,000 domestic properties (over 90% of current households) on the Island had meters installed and all new homes are metered. This had the effect of reducing demand by over 20% and it is safe to say that demand continues to be suppressed compared to the mainland. It also assisted in the identification of leaks in mains and consumer service pipes. There is therefore already a high level of water efficiency in respect of domestic users on the island with only marginal room for improvement.

The strategy also made an assessment of water resource availability across the Region. In general the aquifers and rivers of the Region are heavily committed to abstraction. As this has been the case for many years, licensing policies have evolved which reflect the status of the catchments. The policy is outlined below.

- Where there has been uncertainty, the Agency has refused licences, or issued them with time limits, on the grounds of the 'precautionary principle'.
- There has been a policy of 'presumption against' further consumptive abstraction from most of the Chalk aquifers of the Region.
- For most surface water catchments there is also a 'presumption against' further summer consumptive abstraction. Where possible, potential abstractors are encouraged to apply to take water in the winter and provide reservoir storage from which they can use water in the summer.

A key aspect of the strategy is the need to recover unused licenses or portions of licences to correct past over-licensing. This will help secure protection of the water environment, simplify the resources balance and allow potential for new licences across all sectors of abstraction.

The Regional Strategy provides an overview of water resources management into which the individual CAMS link. The Isle of Wight CAMS document incorporates the principles and policies behind the Regional Strategy but it will also provide the detailed approach to sustainable management of resources at a management unit level.

Progress of the Regional and National Strategy is reviewed annually. New information on water supply

and demand, particularly in respect to public water supply, will be assessed through this process. New information on forecast growth in housing and climate change are particular issues being monitored.

5.2.3. Previous Local Strategies

The licensing policy outlined in CAMS provides the framework on which local licensing policy will be based. It builds on existing licensing policies which have been developed over many years.

Substantial investment was made in Island water resources by Southern Water Authority to deal with routine water shortages experienced in the summers of the 1970s. Sources were refurbished, groundwater augmentation and river transfer schemes were developed and the cross-Solent pipeline was installed to bring water over from the River Test. To protect these newly reinforced resources, a policy was adopted in the 1980s of no further consumptive abstraction in summer from the Medina and Eastern Yar catchments.

This policy was subjected to technical review in 1996 having been confirmed by the National Rivers Authority in the Isle of Wight Catchment Management Plan of 1995 and subsequently in the Local Environment Agency Plan of 2000. It was very similar to long-held policy across Southern Region that presumed against further consumptive abstraction from the Chalk aquifer and from surface water in summer.

In practice, most water resource developments in the 1990s were for the irrigation of arable crops and licences have been granted to fill reservoirs in winter with appropriate flow conditions to protect rivers and downstream water rights. National and European designations such as SSSIs and cSACs have added further protection to some wetland and coastal sites. The commitment of existing licences, the small size of Isle of Wight catchments and the increased weight given to environmental needs have made licences more restrictive and therefore less reliable to operators. Some growers have been able to abstract water for trickle irrigation without restriction under an exemption in the licensing legislation. The Water Act 2003 will however require all such abstractions to be licensed and the Agency recognises that this issue has a greater significance in the Isle of Wight CAMS than in other parts of the country. The details of the process for this licensing are currently being agreed jointly with Defra at a national level.

5.2.3. Water Company Water Resources Plans

Water Companies, in conjunction with the Environment Agency, are required to produce Water Resource Plans looking at supply and demand for the next 30 years. Within these plans issues affecting demand such as proposed new housing development, changes in the way people live and climate change are assessed. Similarly impacts on supply such as climate change and licence changes are examined. In this way, shortfalls in demand are predicted and action can be taken to bring new sources in to supply and to manage demand more effectively.

The Water Resources Plans are updated by the companies annually and are reviewed by the Environment Agency.

The Fourth Periodic Review of water company prices is currently under way and will be determined by Ofwat in November 2004. This includes water company water resources plans. The main Public Water Supply options that could be considered for the Isle of Wight in the future include the following options, none of which are particularly new.

- Some small potential to improve yields from existing sources and treatment works.
- Explore groundwater – surface water source conjunctive use for yield benefit.
- Duplicate the Cross-Solent Main (dependent on continuing mainland supply availability).
- Storage Reservoir(Chillerton).
- Some form of effluent reuse could also be considered.
- Desalination

5.3. Climate Change

The Southern Region Strategy also considers the potential impacts of climate change which is an important issue facing water resources management over this century. The latest climate change scenarios suggest that temperatures will rise across England and Wales and in the southern half of England, summers will become drier while winters will be wetter. The outcome of research is currently uncertain in respect of the impact of these changes on groundwater levels and river flows. The Government has recently published the Climate Change Scenarios for the UK under the UK Climate Impacts Programme (UKCIP02). These details are available on www.ukcip.org.uk/scenarios. We will review the impacts of these latest climate change scenarios.

5.4. Catchment overview of licensing strategy

This document outlines the licensing strategy for the Isle of Wight CAMS area.

The strategy provides an indication of whether licences are likely to be available and the conditions that should be expected on licences. Where recovery of resources is required, it sets out a strategy for achieving this. However, anyone is entitled to apply for a licence, even if the strategy indicates that there may not be water available.

The strategy only relates to licences which have a net impact on the environment. These are likely to be licences where the water is used and not returned to the catchment. Non-consumptive licences will generally be considered in all water resource management units.

Applications for new impoundments are dealt with on a case by case basis. In all cases, licence applications will be considered under the requirements of the Water Resources Act. Local issues of derogation and environmental impact will always be assessed and may override the status of the catchment defined in this CAMS.

The document *Managing Water Abstraction* gives a summary of the Abstraction Licensing process. There are instances, relating to both purpose and quantity, in which a licence is not required. Refer to Annex 2 of *Managing Water Abstraction* for more detailed information.

The Agency operates a rigorous enforcement policy and inspections are regularly carried out to ensure licence holders are meeting the conditions of their licences.

Two management options will be implemented across the catchment regardless of water availability status of the unit.

- In accordance with the Regional Strategy options for reducing or revoking licences that have been unused or partially unused licences have been and will continue to be actively explored throughout the CAMS area
- The Agency will encourage all present and future abstractors of water to employ water efficient methods to reduce the demand for water. These are largely a matter of common sense, involving thinking about the ways water is used and then targeting for reduction. These methods are summarised in the Regional Strategy and details are given on the Agency's demand management website – www.environment-agency.gov.uk/savewater.

5.4.1. Groundwater Licences

68 % of abstraction on the Isle of Wight is from groundwater. The Chalk and Upper Greensand form the primary aquifer whilst the Lower Greensand also supports many abstractions. There is a close link between surface and groundwater with the Eastern Yar approximately 50% dependent upon groundwater. Due to the complex relationship between rivers and aquifers, this CAMS has distinct policies for surface water and groundwater abstractions.

The Resource Assessment has determined that there are no additional resources in the Chalk and Upper Greensand aquifer and that the Lower Greensand is over-licensed. Consumptive abstractions such as spray irrigation use water and do not return it to the catchment. The Agency will continue with a presumption against issuing further consumptive abstraction licences from the unconfined Chalk and Upper Greensand and the Lower Greensand aquifer.

There is no policy for abstraction from other minor aquifers. Local investigation will be required to determine potential environmental impacts and impacts on other abstractors.

5.4.2. Surface Water Licences

Water resource availability calculated for most rivers in the CAMS area generally shows that there is no water available or that the rivers are over-licensed or over-abstracted. In accordance with regional policy, for many years there has been a presumption against issuing consumptive abstraction licences for summer surface water. Winter storage licences have been and will continue to be granted for direct river abstraction between December 1st and March 31st with appropriate flow and level conditions. This position is supported by the recent assessment of water resource availability.



Winter Storage Reservoir at Roud

In recent years, the Agency has issued winter storage licences for abstraction when flows between December 1st and March 31st exceed the median winter flow. This is the flow that is exceeded on average for 50% of the time. High winter flows are recognised as being important to the ecology of streams and rivers and are needed to clean fish spawning gravels and to promote migration of fish. Using the precautionary principle and recognising that the rivers in the CAMS are already heavily committed to abstraction, the median winter flow was selected as an appropriate “hands off” flow condition.

As there are not gauging stations for every river, often a local level condition is used to control new surface water abstractions on the Isle of Wight. In many cases, abstraction is licensed from a sump adjacent to the river. Abstraction is self regulating as it is only permitted when the river is high and overflows into the sump. The overflow level is decided in consultation with applicants and a range of consultees. Level conditions are restrictive, only allowing abstraction for approximately half the winter period.

Many existing surface water abstractions issued before 1989 do not have conditions restricting their use in periods of low flow. Spray irrigation, if not from a reservoir filled in winter, can represent a very significant demand on rivers when they are low in summer. Section 57 of the Water Resources Act gives the Agency powers to impose a temporary restriction on spray irrigators if there has been an exceptional shortage of rain.

5.4.3. Time Limits

Licences applied for or varied after 1st October 2001 are time limited as a matter of Agency and government policy.

The normal renewal period for a time-limited licence in the Isle of Wight CAMS area is the nationally consistent 12 years. Such licences are managed using a common end-date approach. There is a need to move to a situation where all time-limited licences within a CAMS area normally expire on the same date, in this case 31st March 2017, which links with the six year CAMS cycle. In certain circumstances the Agency may consider issuing licences for longer time periods. Similarly if there is local uncertainty or need for further investigation a shorter time limit may be appropriate. There is a presumption of renewal of licences subject to three tests although licence conditions may be reviewed.

When considering renewal of licences, the licence holder must demonstrate:

- The need for water
- The efficient use of water
- There is no environmental damage caused by the abstraction

Licence holders will be notified that their licence will expire and will be expected to re-apply for their licence. The Agency will endeavour to give six years’ notice if a licence is not to be renewed or renewed but on more restrictive terms which impact significantly on the use of that licence. Time limits on non-damaging time-limited licences will be changed to reflect the next reasonable common end date for the catchment.

It should be noted that most existing licences are not time limited so the above opportunities to change conditions are restricted.

Abstraction licences which could have an impact on Habitats Directive sites may have a time limit related to the review of consents timetable.

Further details on time limits are available in *Managing Water Abstraction*.

5.4.4. Introduction to Management Units

Figures 8 & 9 show the units for which water resource availability has been calculated and a strategy has been defined. A generic policy is also detailed for areas outside defined management units.

The following sections outline a strategy for each management unit.

5.5. Water Resource Management Unit 1 – Eastern Yar



5.5.1. Resource availability status and results of the sustainability appraisal

This unit has a resource availability status of Over Abstracted. There are uncertainties within the resource status calculations, particularly with respect to the environmental impact of abstractions. As part of the Agency's Review of Consents process, the impact of abstraction on Brading Marshes will be assessed before the next CAMS review.

Given the uncertainties of the resource assessment, the sustainability process concluded that the unit should be classified as over abstracted until further information on abstraction impacts has been obtained.

5.5.1. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a flow restriction measured as 43.2 Mld ($0.5\text{m}^3/\text{s}$) at Burnt House gauging station will be used. On average, this allows abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time limited to expire with a common end date of 2017, with a standard renewal period of 12 years. Where there may be an impact on Solent and IOW Lagoons cSAC or Solent & Southampton Water SPA, they may be time limited to coincide with the Habitats Directive review date of 2006.

5.5.2. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to determine impacts on Solent and IOW Lagoons cSAC and Solent & Southampton Water SPA. These licences must be reviewed by March 2004 and any work required as a result of the review must begin by 2006 and be implemented by 2010.

There are a number of different flow conditions on licences in this unit. When any of these conditions are breached, the licence holder will be notified by the Agency.

5.5.3. Resource recovery strategy and other changes to existing licences

The current licensing policy will be maintained whilst investigating the environmental impacts of abstraction and reviewing the augmentation scheme operating rules. This will inform the next CAMS review so that it is based on more robust information. The water resource requirements of Brading Marshes will be determined and the impact of abstraction on these flow requirements will then be assessed and options considered, as part of the Agency's review of consents process.

The Agency will also work with the water company to agree operating rules for the augmentation scheme to ensure that it is used efficiently.

Maintaining the current licensing policy whilst this work is completed will at least maintain conditions at their current level.

5.6. Water Resource Management Unit 2 - Medina



5.6.1. Resource availability status and results of the sustainability appraisal

The resource assessment of the River Medina suggests that the river is over licensed. There are uncertainties within the resource status calculations, particularly with respect to the environmental impact of abstractions on the River Medina and also on the downstream Medina Estuary. The over licensed status of this unit is primarily caused by the large augmentation scheme licences. As part of the Agency's Review of Consents process, the impact of abstraction on the Medina Estuary will be assessed before the next CAMS review.

Given the uncertainties of the resource assessment, the sustainability process concluded that the unit should remain over licensed until further information on abstraction impacts has been obtained.

5.6.2. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a flow restriction measured as 29.4 Mld (0.34m³/s) at Shide gauging station will be used. On average, this allows abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time limited to expire with a common end date of 2017, with a normal renewal period of 12 years. Where there may be an impact on Solent Maritime cSAC or Solent & Southampton Water SPA, they may be time limited to coincide with the Habitats Directive review date of 2006.

5.6.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on Solent Maritime cSAC and Solent & Southampton Water SPA. These licences must be reviewed by March 2004 and any work required as a result of the review must begin by 2006 and be implemented by 2010.

There are a number of different flow conditions on licences in this unit. When any of these conditions are breached, the licence holder will be notified by the Agency.

5.6.4. Resource recovery strategy and other changes to existing licences

The current licensing policy will be maintained whilst investigating the environmental impacts of abstraction and reviewing the augmentation scheme operating rules. This will inform the next CAMS review so that it is based on more robust information. The impact of abstraction on the Medina Estuary will be assessed before the next CAMS review.

The Agency will also work with the water company to agree operating rules for the augmentation scheme to ensure that it is used efficiently.

Maintaining the current licensing policy whilst this work is completed will at least maintain conditions at their current level.

5.7. Water Resource Management Unit 3 – Lukely Brook



5.7.1. Resource availability status and results of the sustainability appraisal

This unit has been defined as over abstracted. There are large groundwater abstractions for public water supply in the unit but no surface water abstractions. Groundwater abstractions have also been assessed in the Central Chalk West Groundwater unit. Although flows in the Lukely Brook are depleted by abstraction, the environmental consequences of this are unclear. The sustainability appraisal process identified that the unit should stay as over abstracted whilst further data is collected.

5.7.2. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a flow restriction measured as 27.6 Mld (0.32m³/s) at Carisbrooke gauging station will be used. On average, this allows abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time limited to expire with a common end date of 2017, with a normal renewal period of 12 years. Where there may be an impact on Solent Maritime cSAC or Solent & Southampton Water SPA, they may be time limited to coincide with the Habitats Directive review date of 2006.

5.7.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on Solent Maritime cSAC and Solent & Southampton Water SPA. These licences must be reviewed by March 2004 and any work required as a result of the review must begin by 2006 and be implemented by 2010.

5.7.4. Resource recovery strategy and other changes to existing licences

The current licensing policy will be maintained whilst investigating the environmental impacts of abstraction. This will inform the next CAMS review so that it is based on more robust information. The Agency will work with other groups to gather further ecological data to assess the impacts of abstraction on the brook.

Maintaining the current licensing policy whilst this work is completed will at least maintain conditions at their current level.

5.8. Water Resource Management Unit 4 – Brighstone Stream



5.8.1. Resource availability status and results of the sustainability appraisal

The resource availability status of the Brighstone Stream unit has been defined as water available. There are very few abstractions in the unit and recently licensed abstractions have only authorised winter storage reservoirs. Through the sustainability process it was decided to move towards No Water Available status.

5.8.2. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a local level condition will be used as there is no gauging station within the catchment. The level condition will be designed to try and allow abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time-limited to expire with a common end date of 2017, with a normal renewal period of 12 years. Where there may be an impact on South Wight Maritime cSAC, they may be time-limited to coincide with the Habitats Directive review date of 2008.

5.8.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on South Wight Maritime cSAC. These licences must be reviewed by March 2006 and any work required as a result of the review must begin by 2008 and be implemented by 2010.

5.9. Water Resource Management Unit 5 – Atherfield Brook



5.9.1. Resource availability status and results of the sustainability appraisal

The resource availability status of this unit has been defined as over abstracted.

Studies are currently underway to assess the impact of abstraction on the Chine. Through the sustainability appraisal process it has been determined that these studies will be used to inform any licence changes. This could move the water resource availability status to No Water Available.

5.9.2. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a flow restriction measured as 3.9 Mld (0.045m³/s) at Atherfield gauging station will be used. On average, this allows abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time limited to expire with a common end date of 2017, with a normal renewal period of 12 years. Where there may be an impact on South Wight Maritime cSAC, they may be time limited to coincide with the Habitats Directive review date of 2008.

5.9.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on South Wight Maritime cSAC. These licences must be reviewed by March 2006 and any work required as a result of the review must begin by 2008 and be implemented by 2010.

There are several flow conditions on two licences in this unit. When any of these conditions are breached, the licence holder will be notified by the Agency.

5.9.4. Resource recovery strategy and other changes to existing licences

Current licensing policy will be maintained, with a strong presumption against further consumptive abstraction, whilst the outcomes of the Habitats Directive Review of Consents investigations are completed.

Investigations are currently under way to determine what impact, if any, abstraction licences have on Shepherds Chine which is part of South Wight Maritime cSAC. Depending on the results of these investigations either the environmental flow requirements will be reviewed or appropriate changes made to licences to protect the Chine. Either case will result in the resource status of the unit being re-classified to 'No water available'.

5.10. Water Resource Management Unit 6 – Central Chalk (West)



5.10.1. Resource availability status and results of the sustainability appraisal

The resource availability status of this unit has been defined as over abstracted. The unit includes the Upper Greensand as well as the Chalk.

The assessment took into account flows from the Chalk unit to the River Medina, Lukely Brook, Caul Bourne, Shorwell Stream and Brighstone Stream. The sustainability appraisal determined that the unit should remain as over abstracted until the environmental impact of abstraction on these streams has been resolved. This option is linked to the preferred option for WRMU 3 – Lukely Brook.

In addition, a groundwater model of the aquifer should be developed to improve understanding and assist in future water resource management.

5.10.2. Guidance on the assessment of new applications

The Agency will retain the existing policy of a presumption against issuing consumptive licences from the Chalk and Upper Greensand.

5.10.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on Solent Maritime cSAC and Solent & Southampton Water SPA. These licences must be reviewed by March 2004 and any work required as a result of the review must begin by 2006 and be implemented by 2010.

Despite the fact that this is a groundwater unit, several licences have flow conditions related to nearby water features. When flows fall below these flow conditions, the licence holder will be notified by the Agency.

5.10.4. Resource recovery strategy and other changes to existing licences

Current licensing policy will be maintained whilst the environmental impacts of abstraction are investigated and a groundwater model developed.

This will inform the next CAMS review so that it is based on more robust information.

The study will be linked with the work proposed for WRMU 3 – Lukely Brook and will also need to consider the environmental impact of low flows on other water features supported by the Chalk.

A groundwater model is planned for the Central Chalk Downs including WRMU 7 – Central Chalk East. Before this work is completed a scoping study is planned to gather more information about spring flows from the Chalk.

Maintaining the current licensing policy whilst this work is completed will at least maintain conditions at their current level.

5.11. Water Resource Management Unit 7 – Central Chalk East



5.11.1. Resource availability status and results of the sustainability appraisal

This unit has been assessed as over licensed. The sustainability appraisal process has determined that the unit will remain as over licensed until the water resources of the unit are better understood. In addition, a conceptual model of the groundwater system will be developed with WRMU6 to improve understanding of the central Chalk and Upper Greensand aquifer.

5.11.2. Guidance on the assessment of new applications

The Agency will retain the existing policy of a presumption against issuing consumptive licences from the Chalk and Upper Greensand.

5.11.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on Solent Maritime cSAC and Solent & Southampton Water SPA. These licences must be reviewed by March 2004 and any work required as a result of the review must begin by 2006 and be implemented by 2010.

5.11.4. Resource recovery strategy and other changes to existing licences

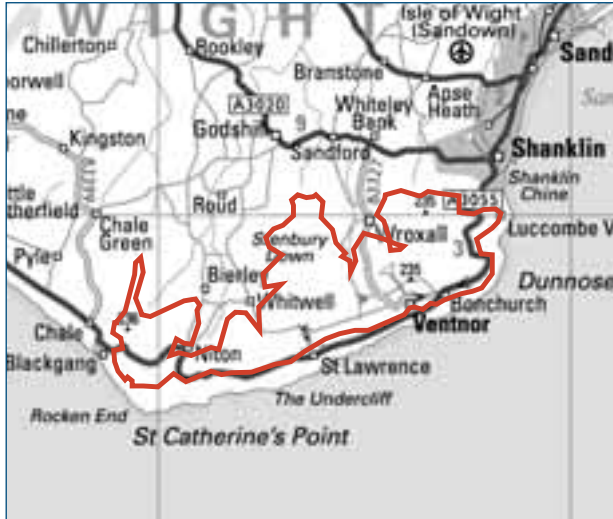
Current licensing policy will be maintained whilst the environmental impacts of abstraction are investigated and a conceptual groundwater model developed. This will inform the next CAMS review so that it is based on more robust information.

The study will be linked with the work proposed for WRMU 3 – Lukely Brook, WRMU 6 – Central Chalk West and will also need to consider the environmental impact of low flows on other water features supported by the Chalk.

A groundwater model is planned for the Central Chalk Downs. Before this work is completed a scoping study is planned to gather more information about spring flows from the Chalk.

Maintaining the current licensing policy whilst this work is completed will maintain conditions at their current level.

5.12. Water Resource Management Unit 8 – Southern Downs Chalk



5.12.1. Resource availability status and results of the sustainability appraisal

The resource assessment for this unit has been defined as No Water Available. This unit also includes the Upper Greensand aquifer.

The sustainability process has determined that further understanding of the system should be progressed by developing a groundwater model of the groundwater system.

5.12.2. Guidance on the assessment of new applications

The Agency will retain the existing policy of a presumption against issuing consumptive licences from the Chalk and Upper Greensand.

5.12.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on South Wight Maritime cSAC. These licences must be reviewed by March 2006 and any work required as a result of the review must begin by 2008 and be implemented by 2010.

5.13. Water Resource Management Unit 9 – Lower Greensand



5.13.1. Resource availability status and results of the sustainability appraisal

The resource assessment has defined that this unit is over licensed. The interaction of the Lower Greensand with surface water is particularly complex. The impact of groundwater abstractions from the Lower Greensand on Eastern Yar, River Medina, Brightstone Stream and Atherfield Brook has been assessed in each of the surface water WRMUs.

Given the uncertainties of the resource assessment, the sustainability process has determined that the unit will remain over licensed and further information on environmental impacts will be collected.

5.13.2. Guidance on the assessment of new applications

The Agency will retain the existing policy of a presumption against issuing consumptive licences from the Lower Greensand.

5.13.3. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on South Wight Maritime cSAC, Solent Maritime cSAC and Solent & Southampton

Water SPA. These licences must be reviewed by March 2006 and any work required as a result of the review must begin by 2008 and be implemented by 2010.

Despite the fact that this unit is a groundwater unit, seven abstraction licences have flow conditions. When flows fall below the flow condition, the licence holder will be notified by the Agency.

In addition to licensed abstractions there are several abstractions within this unit for the purpose of trickle irrigation, which is currently exempt from licensing. The Water Act 2003 requires that in the future these will require licensing and a process is being agreed by the Environment Agency and Defra as to how this will happen. Some of these trickle irrigators have been providing data on abstraction data to the Agency for some years and these have been taken into account in establishing the resource status.

5.13.4. Resource recovery strategy and other changes to existing licences

Current licensing policy will be maintained whilst the environmental impacts of abstraction are investigated. This will inform the next CAMS review so that it is based on more robust information.

As the Lower Greensand is so complex, a groundwater model is not proposed but opportunities will be taken to improve understanding of the aquifer wherever possible through test pumping. Work to look at the environmental impact of abstraction in WRMUs 1 and 2 – the Eastern Yar and River Medina will also be relevant.

Maintaining the current licensing policy will at least maintain conditions at their current level.

5.14. Remaining CAMS Area not within a Water Resource Management Area



Western Yar

5.14.3. Resource recovery strategy and other changes to existing licences

Formal sustainability appraisal was not carried out for catchments which are not in a Water Resource Management Unit.

5.14.1. Guidance on the assessment of new applications

Consumptive surface water licences will be considered for winter storage with appropriate flow or level conditions. Where appropriate, a flow restriction measured at a gauging station will be used. If there is no gauging station within a catchment a local level condition will be used. Flow and level conditions will be designed to allow abstraction for 50% of the time between December 1st and March 31st.

New licences will normally be time limited to expire with a common end date of 2017, with a normal renewal period of 12 years. Where there may be an impact on South Wight Maritime cSAC, Solent Maritime cSAC and Solent & Southampton Water SPA they may be time limited to coincide with the Habitats Directive review date of 2006.

5.14.2. Renewals and management of existing licences

There will be a presumption of renewal of licences subject to the other renewal criteria and local considerations. Licence conditions may be subject to minor changes including the addition of water efficiency conditions.

Some licences within this unit will be assessed under the Habitats Directive review of consents to see if they have an impact on South Wight Maritime cSAC, Solent Maritime cSAC and Solent & Southampton Water SPA. These licences must be reviewed and any solutions started by 2006 and implemented by 2010.

5.15. Summary of Licensing Policy for Isle of Wight CAMS area

- There is a presumption against issuing new abstraction licences for consumptive abstraction of summer surface water.
- Winter storage schemes will be encouraged where appropriate.
- Consumptive abstraction will only be permitted over the winter period of December to March with an appropriate flow or level condition. This will on average allow abstraction for 50% of the time when flows are high, preventing abstraction at times when winter flows are very low.
- There is a presumption against issuing licences for further consumptive abstraction from the Chalk, Upper Greensand and Lower Greensand.
- Most new licences will be time limited to 31/03/2017.
- Options for reducing or revoking licences that have been unused, or partially unused, will be actively explored in full consultation with licence holders.

5.16. Opportunities for licence trading in the Isle of Wight CAMS area

One of the objectives of the CAMS process is to facilitate licence trading. This term refers to the transferring of licensable water abstraction rights between two or more parties. Licence trading is essentially a new phrase to describe a particular application of existing licensing processes and occurs within these existing processes. It does not provide any short circuit to the normal licence determination process and the Agency will not be involved in any negotiations regarding remuneration between parties connected with the trade. More detailed information is available in Section 4 of 'Managing Water Abstraction'.

A guidance leaflet (Water Rights Trading) was published and sent to Licence Holders towards the end of 2002 explaining the scope for abstraction licence trading within current legislation. Consultation on more detailed proposals followed in 2003 addressing the following key issues:

- the assessment of reasonable need for trading applications
- trading of unused licences within environmentally vulnerable catchments
- administration of the licensing system to facilitate trading
- the role of information in facilitating trading
- the role of CAMS in trading
- the Agency's role as a participant in water rights trades

Final guidance and a detailed framework within which licence trading will take place under the new Water Act 2003 is expected during the first half of 2004.

5.17. Water Act 2003

Following the first major review of the abstraction licensing system since its inception in 1963, the Government set out in 1999 a new framework for managing water resources. The CAMS process and the move to time limited licences are key elements of the new framework, which is completed by revisions to the statutory framework introduced by the Water Act 2003. The Act updates the Water Resources Act 1991 in several key areas

- Deregulation of small abstractions
- New controls on previously exempt abstractions for mine and quarry dewatering, trickle and other forms of irrigation, transfers into canals and internal drainage districts
- Stronger powers for water resources planning and management
- Changes to the legal status of abstraction licences
- More flexibility to the licensing regulations to improve its efficiency and to encourage trading
- Stronger powers on water conservation

For more details on the Act and its implementation, see the Agency's web-site.

The site will be updated to provide information as the Water Act is implemented.

5.18. Water Efficiency

In the consultation phase of the CAMS process a number of respondents commented on the need for water efficiency measures in order to conserve water on the Island. The reduction in water demand is of prime importance if more sustainable use of this limited resource is to be realised. With 78% of the Island's water abstracted for public water supply, increased water efficiency by domestic users would contribute significantly to this objective.

The Water Act 2003 gives increased opportunities to encourage water efficiency measures by placing new duties on all public authorities and water companies to conserve water. These are at present being interpreted by the Agency and Defra at a national level.

It is intended to pursue opportunities by:

- Working with the water company to further promote water efficiency measures by domestic users
- Working with the Isle of Wight Council to explore any planning measures in respect of new developments that can be adopted

Useful water efficiency contacts can be found in Appendix 1 of this document.

Future developments in the CAMS area

Concern has been expressed by the Stakeholder group about development on the Isle of Wight and the future increase in demand for water. These issues are addressed in the Agency's Southern Region Water Resources Strategy and Southern Water's Water Resource Plans. These planning tools are constantly updated as the scale of planned development and future estimates of water demand and the impacts of climate change and other factors are refined. Within existing licensed abstractions, there are considered to be sufficient resources to meet demand over the next 30 years.

Before the next review of the Isle of Wight CAMS, more data will be required to substantiate the over abstracted status of units in order that appropriate remedial options can be considered. The Agency will be producing groundwater models for the Central Chalk and Southern Downs Chalk and will also be working with the water company to develop operating rules for the augmentation schemes to ensure its efficient use.

Post-CAMS Actions

The following Table 4 details key actions that need to be undertaken before the next review of the Isle of Wight CAMS commencing in April 2008.

The progress of these actions will be monitored and a yearly update report produced.

Table 4 - Key Actions

ACTIONS	WHO BY	WHEN
Agree operating rules for Eastern Yar augmentation schemes	Southern Water/ Environment Agency	2004 - 2005
Establish flow requirements for Brading Marshes	Brading Marshes Liaison Group	2004 - 2006
Investigate potential methods of increasing water efficiency by domestic users	Environment Agency/ IW Council/ Southern Water	2004 - 2007
Undertake Scoping Study of Central Chalk spring flows	Environment Agency	2004 - 2006
Develop Groundwater Model of Central Chalk	Environment Agency	2006 - 2008
Develop simple Groundwater Model of Southern Downs	Environment Agency	2006 - 2008
Undertake study on the impact of abstraction on the ecology of Plaish meadows/Lukely Brook	IW Council & partners/ Environment Agency	2004 - 2008
Develop more accurate profile of ecology/fisheries for South Wight streams	Environment Agency	2004 - 2008
Complete study on the impact of abstraction on the geomorphology and ecology of the chines	Environment Agency	2004
Implement results of EU Habitats Directive Review of Consents	Environment Agency	2006 - 2010
Implement provisions of Water Act 2003 in respect of trickle irrigation in close liaison with licence applicants	Environment Agency	2004 - 2008

Useful Water Efficiency Contacts

General/All sectors

Environment Agency

The Environment Agency provides a range of free guidance on water efficiency, including best practice case studies, for agriculture, business, industry, public sector and the domestic consumer. Consult www.environment-agency.gov.uk/savewater or telephone 01903 832275.

Water companies

For local water efficiency advice, contact your water company. Consult www.southernwater.co.uk

Water Regulations Advisor Service

WRAS provides advice on the Water Supply (Water Fittings) Regulations which prevents waste, misuse, undue consumption or contamination of wholesome water. Consult www.wras.co.uk or telephone 01495 248454.

Business/Commercial

Envirowise

Envirowise is a government programme offering free, independent advice on practical ways for industrial and commercial SME's to minimise waste and convert turnover into profit. Envirowise has a specific water section to their website 'Waternet', which includes links to guidance published around the world and a benchmarking tool. Consult www.envirowise.gov.uk/waternet or telephone the Environment & Energy helpline: 0800 585 794.

Public Sector

Watermark

Watermark is an initiative from OGCBuying.solution (part of the Office of Government Commerce in the Treasury) for public sector organisations. It has produced benchmarks for a wide range of public sector buildings, and offers access to a shared savings scheme for the installation of new, water efficient, devices. Consult www.watermark.gov.uk

Water in Schools

Water in the School is a website supported by a number of water companies aimed at KS2 and KS3 pupils and their teachers. It provides a wealth of information for pupils as well information on how to make savings. Consult www.waterintheschool.co.uk

Hospitals

Water UK has collaborated with NHS Estates and Watermark to produce *Water Efficient Hospitals*, an information pack to help hospitals use water wisely and save money by cutting both water and energy bills. Consult www.water.org.uk/index.php?cat=3-4701

Agriculture & Horticulture

UK Irrigation Association (UKIA)

The UKIA provides information on irrigation to its members and runs technical workshops. Consult www.ukia.org

Defra Rural Development Service (RDS)

Defra's Rural Development Service provides grants for agricultural water resources management schemes under its Rural Enterprise Scheme. Consult www.defra.gov.uk/erdp/default.htm or telephone 0845 9335577.

Glossary

Abstraction

Removal of water from a source of supply (surface or groundwater).

Abstraction - Actual

The volume of water actually abstracted as opposed to the volume of water that may be abstracted under the terms of an abstraction licence. Individual abstraction records are reported to the Environment Agency each year.

Abstraction licence

The authorisation granted by the Environment Agency to allow the removal of water from a source.

Aquifer

A geological formation, group of formations or part of a formation that can store and transmit water in significant quantities.

Assessment Point

Critical point in catchment at which an assessment of available resources should be made. APs are located at the extremities of identified reaches and water resource management units.

Augmentation (river)

To increase flow

Baseflow

That part of the river flow that is derived from groundwater sources rather than surface run-off.

Biodiversity

The living component of the natural world. It embraces all plant and animal species and communities associated with terrestrial, aquatic and marine habitats. It also includes genetic variation within species.

Borehole

Well sunk into a water bearing rock from which water will be pumped.

Catchment

The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.

Cessation condition

A condition on a licence that requires the licence-holder to immediately cease abstracting when a pre-determined flow or water level is reached, to prevent environmental damage.

Confluence

The point where two or more streams or rivers meet.

Consumptive use

Use of water where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use.

Demand

The requirements for water for human use.

Demand management

The implementation of policies or measures which serve to control or influence the consumption or waste of water.

Derogation

In legal terms, the taking away of protected rights under the Water Resources Act due to the granting of a new licence.

Discharge

The release of substances (i.e. Water, sewage etc.) into surface waters.

Discharge Consent

A statutory document issued by the Environment Agency, which defines the legal limits and conditions on the discharge of an effluent into controlled waters.

Drought

A general term covering prolonged periods of below average rainfall resulting in low river flows and/or low recharge to groundwater, imposing significant strain on water resources and potentially the environment.

Drought Order

A means whereby water companies and/or the Environment Agency can apply to the Secretary(ies) of State for the imposition of restrictions in the uses of water and/or which restricts or stops abstraction where environmental damage is being caused.

Drought Permit

The mechanism by which the Environment Agency (with the consent of the local Navigation Authority, if applicable) permits a Water Company to abstract water outside of the normal terms of an Abstraction Licence.

Ecosystem or Ecological River Flow Objectives/level requirements

The minimum river flows (or water levels) required to protect ecological objectives.

Effective rainfall

That rainfall available for recharge of aquifers or to support river flows after 'losses' due to evaporation and take-up by plants.

Effluent

Liquid waste from industrial, agricultural or sewage plants.

Environmental allocation

The amount of water that is required to support the ecology of a river

Environmental flow/level requirements

River flow or water level needs within a catchment to prevent ecological damage.

Environmental impact

The total effect of any operation on the environment.

Environmental River Flow Objectives

The minimum river flows from the area required to protect ecological and other environmental objectives

Environmental Weighting

An assessment of a river's sensitivity to abstraction based on physical characteristics, fisheries, macrophyte and macro-invertebrates for a catchment/sub-catchment

Fauna

Animal population of a particular area or epoch.

Flood plain

Land adjacent to a watercourse that is subject to flooding.

Flora

Plant population of a particular area or epoch.

Flow duration curve

Plot of flow vs percentage of time a flow is exceeded. Thus QN95 (the natural flow that is exceeded 95% of the time) will be a low rate of flow, and QN5 (natural flow exceeded 5% of the time) will be a high rate of flow.

Fluvial

Associated with river processes such as flow and erosion.

Gauged flow records

Records of flow in river as conventionally measured. They reflect not only natural run-off from the catchment, but also artificial influences (abstraction, discharge etc) that occur upstream of the measurement point.

Gauging station

A site where the flow of a river is measured.

Geomorphology

Scientific study of land forms and of the processes that formed them.

Groundwater

Water occurring below ground in natural formations (typically rocks, gravels and sands).

Groundwater baseflow

That part of the river flow that is derived from groundwater sources rather than surface run-off e.g. soil water, reservoir releases, effluents etc.

Groundwater Management Units

Administrative sub-divisions of aquifers, defined on geological and hydrogeological criteria, which form the basis for groundwater resource management and licensing policy decisions.

Groundwater Protection Policy

Environment Agency policy relating to groundwater recharge areas to control activities having the potential to pollute underground water.

Habitat

Place in which a species or community of species live, with characteristic plants and animals.

Hands-Off Flow

A condition attached to the abstraction licence so that if the flow in the river falls below the flow specified on the licence then the abstractor may be required to stop or reduce the abstraction.

Hands-Off Level

Level below which an abstractor may be required to stop or reduce abstraction (i.e. groundwater level or river stage, to be specified on a licence, as a condition of that licence).

Hydrogeology

Branch of geology concerned with water within the Earth's crust.

Hydrograph

Plot of flow versus time.

Hydrology

The study of water on and below the earth's surface.

Hydrometry

The measurement of water on or below the earth's surface.

Impoundment

A dam, weir or other work constructed in an inland water, whereby water may be impounded and any works for diverting flows in an inland water associated with the construction of a dam, weir or other work.

Irrigation

Supply (land) with water by means of artificial canals, ditches etc, especially to promote the growth of food crops.

Land drainage

Actions taken to reduce waterlogging of agricultural land and to minimise flood risk.

Leakage

Water lost from a supply network between the point of supply and point of demand.

Licence

Formal permit allowing the holder to engage in an activity (in the context of this report, usually abstraction), subject to conditions specified in the licence itself and the legislation under which it was issued.

Licence application

Formal request by individual or organisation to the competent authority for a licence. For abstraction licences, the competent authority is the Environment Agency.

Licence determination

A decision by the competent authority on whether and on what terms to grant or refuse a licence application, by reference to the authority's regulatory powers and duties.

Licence of Right

Licence granted under section 23 of the Water Resources Act 1963 in respect of an abstraction that was already in operation when that Act was implemented in 1965.

Licence trading

A commercial transaction for the purpose of transferring an abstraction licence between two parties

Licensed abstraction and discharge Impacts

The impacts of abstractions and discharges calculated for current abstraction licences and discharges based on full uptake of licensed abstraction rates and consumptiveness assumptions

Licensed entitlement

Amount of water that may be abstracted within the terms of a licence. Generally specified in terms of maximum per day, month and year (or season), with the monthly/annual amounts being typically less than the factored daily equivalent.

Low flow

The flow that is exceeded for a given percentage of the time. For example Q95 is the flow that is exceeded 95% of the time, this means that flow will only fall this low 5% of the time.

Macro invertebrate

An animal without a backbone which is easily visible to the naked eye.

Maintained flow

The flow on a regulated river that shall be maintained by groundwater pumping, reservoir releases or inter-basin transfer.

Managing water abstraction

Document produced in May 2001 on the CAMS Process.

Mean flow

A long term average of the daily flow.

Natura 2000

The habitats Directive will establish and protect a network across Europe of the most important areas for Wildlife, to be known as Natura 2000. This will include all SPAs and SACs on sites which are already SSSIs.

Natural flows

The flows, which would naturally leave an Assessment Area or assessment point in the absence of any artificial impacts.

Precautionary principle

Where significant environmental damage may occur, but knowledge on the matter is incomplete, decisions made should err on the side of caution.

Precipitation

Deposition of moisture including dew, hail, rain sleet and snow.

Protected right

Protected rights include all existing licensed abstractions, and certain exempt abstractions for domestic and agricultural purposes (excluding spray irrigation) not exceeding 20m³/d.

Public water supply

Term used to describe the supply of water provided by a water undertaker.

RAM framework

Resource Assessment and Management Framework – a technical framework for resource assessment (for the definition and reporting of CAMS) and subsequent resource management (including abstraction licensing).

Ramsar site

A site of international conservation importance classified at the 'Convention on Wetlands of International Importance' 1971, ratified by the UK Government in 1976.

Reach

A length of river.

Recent actual abstraction and discharge impacts

The impacts of abstractions and discharges calculated for current abstraction licences and discharges based on recent abstraction returns or estimated from uptake and consumptiveness assumptions.

Recharge

Water which percolates downward from the surface into groundwater.

Revocation

Cancellation of licence and associated rights and benefits.

River

An open channel in which inland, surface water can flow.

River reach

Unit of a river between two assessment points, delineated for the purposes of abstraction licensing and resource management.

Saline intrusion

The ingress of salt water into an aquifer, from sea or estuary, due to groundwater depression normally caused by excessive groundwater abstraction.

Salmonids

Members of the family salmonidae, includes Salmon, Trout and Char.

Special area of conservation (SAC)

A Special Area of Conservation is one classified under the EC Habitats Directive and agreed with the EC to contribute to biodiversity by maintaining and restoring habitats and species.

Special Protection Area (SPA)

A Special Protection Area is one classified as such under the EC Birds Directive to provide protection to birds, their nests, eggs and habitats.

Spray irrigation

Abstracted water sprayed onto grassland, fruit, vegetables etc. Can have a high impact on water resources.

Springs

These occur where the water table intersects the ground surface.

Site of Special Scientific Interest

A Site of Special Scientific Interest is an area given a statutory designation by English Nature or the Countryside Council for Wales because of its nature conservation value.

Surface water

This is a general term used to describe all the water features such as rivers, streams, springs, ponds and lakes.

Surface water catchment

The area from which runoff would naturally discharge to a defined point of a river, or over a defined boundary.

Sustainable development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves meeting four objectives simultaneously:

- social progress which recognises the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources;
- maintenance of high and stable levels of economic growth and employment.

Tidal limit

The most upstream point within an estuary or river where water levels are subject to tidal variation.

Time limited licence

Licence with specified end date

Trickle irrigation

The irrigation of crops by taking water direct to roots of plants, but without spraying or ejecting into the air.

Water Resource

The naturally replenished flow or recharge of water in rivers or aquifers

Water Resource Management Unit

An area that has similar groundwater and or surface water characteristics and is managed in a similar way.

Wetland

An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.

List of Abbreviations

AMP

The acronym for the Asset Management Plan produced by the Water Companies for OFWAT. It sets out the water industry investment programme. These plans are drawn up through consultation with the Environment Agency and other bodies to cover a five year period. AMP's have to be agreed by the DETR and OFWAT.

AONB

Area of Outstanding Natural Beauty.

AP

Assessment Point.

BAP

Biodiversity Action Plan.

CAMS

Catchment Abstraction Management Strategy.

EIA

Environmental impact assessment.

FDC

Flow Duration Curve.

HOF

Hands off flow.

km

Kilometres.

m³/s

Cubic metres per second.

MAF

Minimum Acceptable Flow, Section 21 of the Water Resources Act 1991.

MI, MI/d, MI/day

MI = megalitres = 1,000,000 litres = 1,000 cubic metres = 1,000 m³ = 220,000 gallons

MI/d = MI/day = MI per day, = tcmd, thousand cubic metres per day.

mm

Millimetres.

NRA

National Rivers Authority (now incorporated within the UK Environment Agency).

OFWAT

Office of Water Services.

PWS

Public Water Supply.

Q50

Flow exceeded during 50% of period over which flow data are being considered.

Q95

Flow exceeded during 95% of period over which flow data are being considered.

SAC

Special Area of Conservation.

SPA

Special Protection Area.

SSSI

A Site of Special Scientific Interest i.e. an area given a UK statutory designation because of its conservation value.

SW

Surface water.

www.environment-agency.gov.uk/cams

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