Submission ID: SAFEB4BC6

My comments relate to my verbal statements at the meeting on the 12th November when I asked the ExA to put the comments on water quality in the HT reservoir in context. My points, in summary, were:
(i) the reservoir is an environmental buffer between the advanced wastewater treatment plant and the Southern Water and Portsmouth Water water treatment plants; (ii) it is a reservoir for storing water for human consumption. It needs to be though of and managed as such; (iii) we all drink recycled water. It is said that by the time water gets to someone in Greenwich on the Thames it has been through 7 other people. Water abstracted from the River Itchen at Otterbourne has secondary wastewater treated effluent in it emanating from the Harestock and Morestead wastewater treatment plants, as well as wastewater emanating from 2,000 plus septic tanks in rural areas upstream of Otterbourne; (iv) Water coming from the Havant Thicket reservoir is highly likely to be cleaner than water abstracted from the River Itchen at Otterbourne; (v) The vast majority of the water from the reservoir will be consumed by Southern Water customers. They will pay for the reservoir through their water fees over time.
A final comment on a statement made towards the end of the day on the 12th November about the lifespan of the advanced wastewater treatment works "only being 60 years". It is not correct to think of important physical infrastructure such as this having a limited lifespan. Such infrastructure is repaired, upgraded, rehabilitated and modernized over time in a continuous process. For example, the Sukkur Barrage on the Indus in Pakistan serves 7.63 million acres of irrigated land. It was built 100 years ago between 1923-32 and is still going strong having been periodically repaired and the 60 gates replaced over time.

HWTWRP presentation Wednesday 11th November 2026

Dr Martin Burton, Water Resources Management Specialist, Upper Itchen Restoration Community Interest Company

Presentation made on 11th November to the Examining Authority.

Personal background

I am a water resources management specialist with over 40 years' experience in water resources development and management, both internationally and in the UK. I have experience of preparing large scale water resources assessments and projects overseas for the World Bank and Asian Development Bank, notably in Turkey, Kyrgyzstan and India, particularly Madhya Pradesh.

I lectured and supervised research in irrigation and water resources management at the University of Southampton for 15 years, and actively engaged in water resources management in Hampshire, initially through the Hampshire Water Partnership, then the Upper Itchen Initiative and currently as a Director of the Upper Itchen Restoration Community Interest Company.

I was actively engaged through the Upper Itchen Initiative in the discussions with the Environment Agency and others in 2017-18 which led to Southern Water accepting the licence changes on the lower Test and Itchen and the Candover Brook. This action led to SW seeking new sources of water, including working with Portsmouth Water to develop Havant Thicket Reservoir.

My contribution to the discussions today

I have four key areas that I would like the Examining Authority to pay particular attention to regarding the proposed project:

1. **Water scarcity.** Due to population density and relatively low rainfall the South East of England is designated as a water scarce and water stressed region. Other than desalination and water recycling we have no additional sources of water available to meet increasing population growth and climate change. On the Test and Itchen we have suffered 3 droughts in the last 7years (in 2022, 2025 and 2026). Without substantial rainfall this (winter and spring we will likely suffer a further drought in 2027 (see Annex A1). Groundwater levels are currently lower than the long-term average and lower than this time last year.

2. **Water balance**. The Test and Itchen catchments have been in water deficit for some 20 years. The Environment Agency's March 2006 T&I Catchment Abstraction Management Plan (Annex A2) stated that of the 20 Water Resources Management Units in Hampshire, 3 were Over-abstracted, 3 Over Licensed and 14 had No Water Available. The situation has worsened since

2006. We need more water coming into these river basins, especially during drought periods if the aquatic environment is not to suffer serious damage.

3. **The need for the project**. Much of the documentation refers to potential issues facing the project rather than the benefits. Insufficient attention is given to the NEED for the project and its outcome – namely to provide additional, sustainable water resources into the T&I catchment to alleviate the severe pressure that the Test and Itchen rivers and groundwater are currently facing. Failure to proceed with the project places these rivers and their unique ecosystems at severe risk.

   It must not be forgotten that the Test and Itchen are iconic, internationally renowned aquatic ecosystems. There are only 280 or so chalk rivers and streams in the world, with 85% of them being in England and three of the most renowned rivers, the Test, Itchen and Meon being in Hampshire. We must protect these unique ecosystems.

   Southern Water make the case for the project in APP-057 Section 5.6. The Environment Agency in APP-67 Table 3.1 does a good job supporting the project and points to the significant lack of water resources resilience in Hampshire and the need for large scale water supply options. The EA is satisfied that there is a lack of viable alternatives to the proposed Project to provide the necessary scale of water supply resilience needed in the time frame required.

   Amongst the local authorities in Table 3.1 only Winchester City Council (APP-066) highlights the need for the project. The South Downs National Park (APP-065) “Welcomes pipeline routing which avoids the National Park” but fails to say anything of the environmental benefit to the Test and Itchen rivers of the project, or the harm to these ecosystems if the project does not proceed. Eastleigh Borough Council (APP-059) make no reference to the pollution issues in their stretch of the Itchen and the need to leave water in the river during a drought to dilute the chemical load coming out of Chickenhall and Portswood wastewater treatment works.

4. **Consequences if the project does not proceed.** I cannot find any discussion of the issues facing the Test and Itchen rivers and groundwater **if this project does not proceed**. These issues may well be a good deal greater and more harmful to the environment than some of the issues raised in all this documentation.

Dr Martin Burton

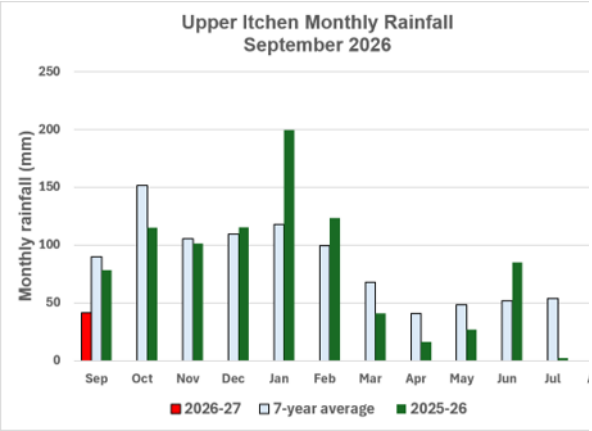
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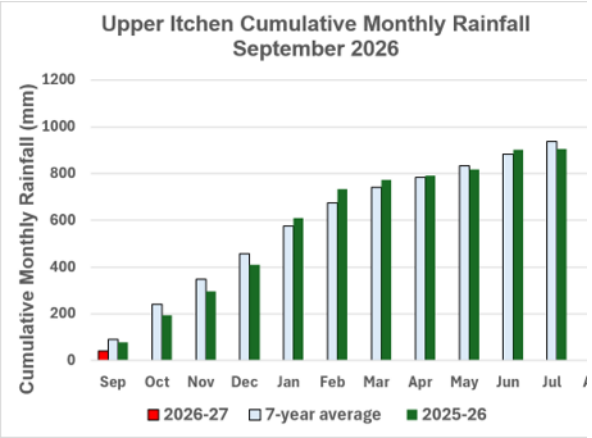
Annex A1 Monthly Water Resources Bulletin produced by the UIRCIC – September 2026

Introduction

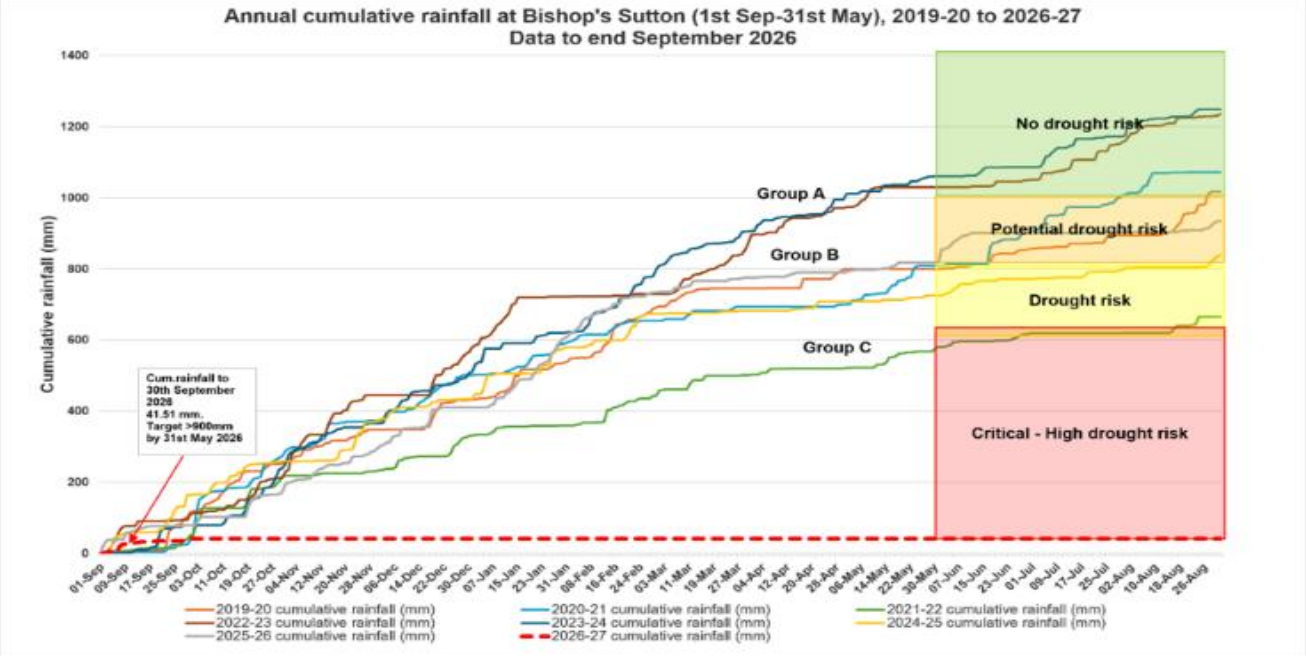
This bulletin provides information on the cumulative rainfall, groundwater level and river discharge for the Upper Itchen. Rainfall is accumulated from the start of the hydrological year in September, not the calendar year. Daily rainfall and groundwater data are obtained from the Environment Agency's rainfall and groundwater measuring stations in Bishop's Sutton. The daily River Itchen flow is the summation of the flows at the measuring stations located at the tail ends of the River Alre at Drove Lane, the Cheriton Stream at Seward's Bridge and the Candover Brook at Borough Bridge. Data are taken from the Environment Agency's hydrology database: https://environment.data.gov.uk/hydrology/explore

Monthly rainfall

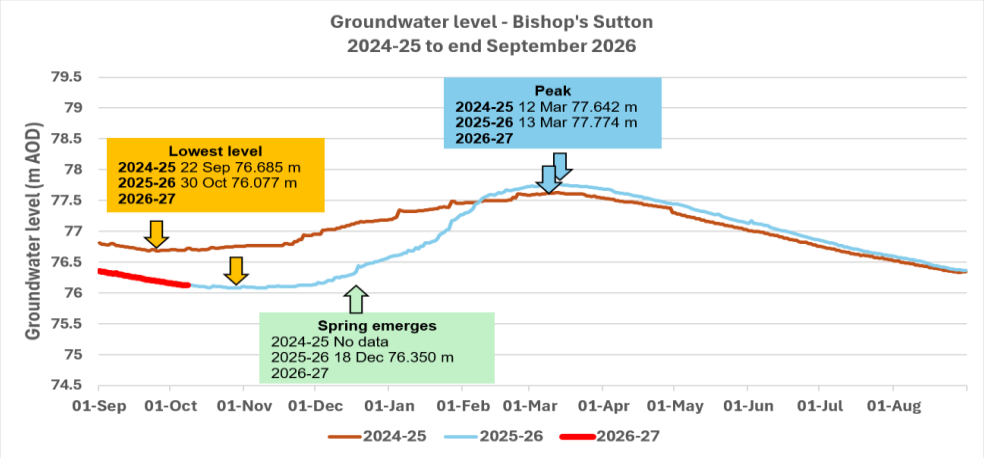




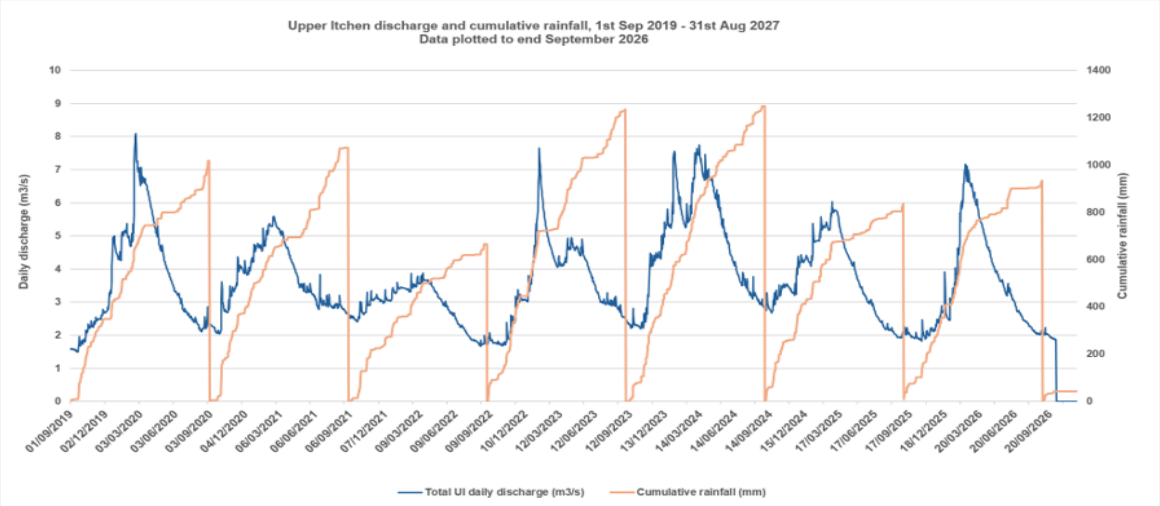
Cumulative rainfall



Groundwater



River discharge



Summary (All data are as at 30th September in their respective years unless otherwise stated.)
The format of the bulletin has been changed to enable monthly plots of rainfall to be shown. Based on experience with last year's data a new category has been introduced into the cumulative rainfall graph. In addition, it is apparent that more attention needs to be paid to the groundwater deficit at the start of the year. The groundwater graph has been amended to provide a format that enables easier comparison between years.

The **rainfall** in September has been poor, with only 41.5 mm compared to 78.6 mm last year and a 7-year average of 90.2 mm. Not a good start. The **cumulative rainfall** to date (red line on graph) reflects this poor start.

The **groundwater level** has fallen to 76.16 m AOD, the same as last year at 76.17 m AOD. At present this year's trajectory is following last year's. The difference in the GW profiles can be seen in the graph and shows the significant shortfall in GW storage that occurred at the start of last year. Unfortunately we are on the same trajectory this year.

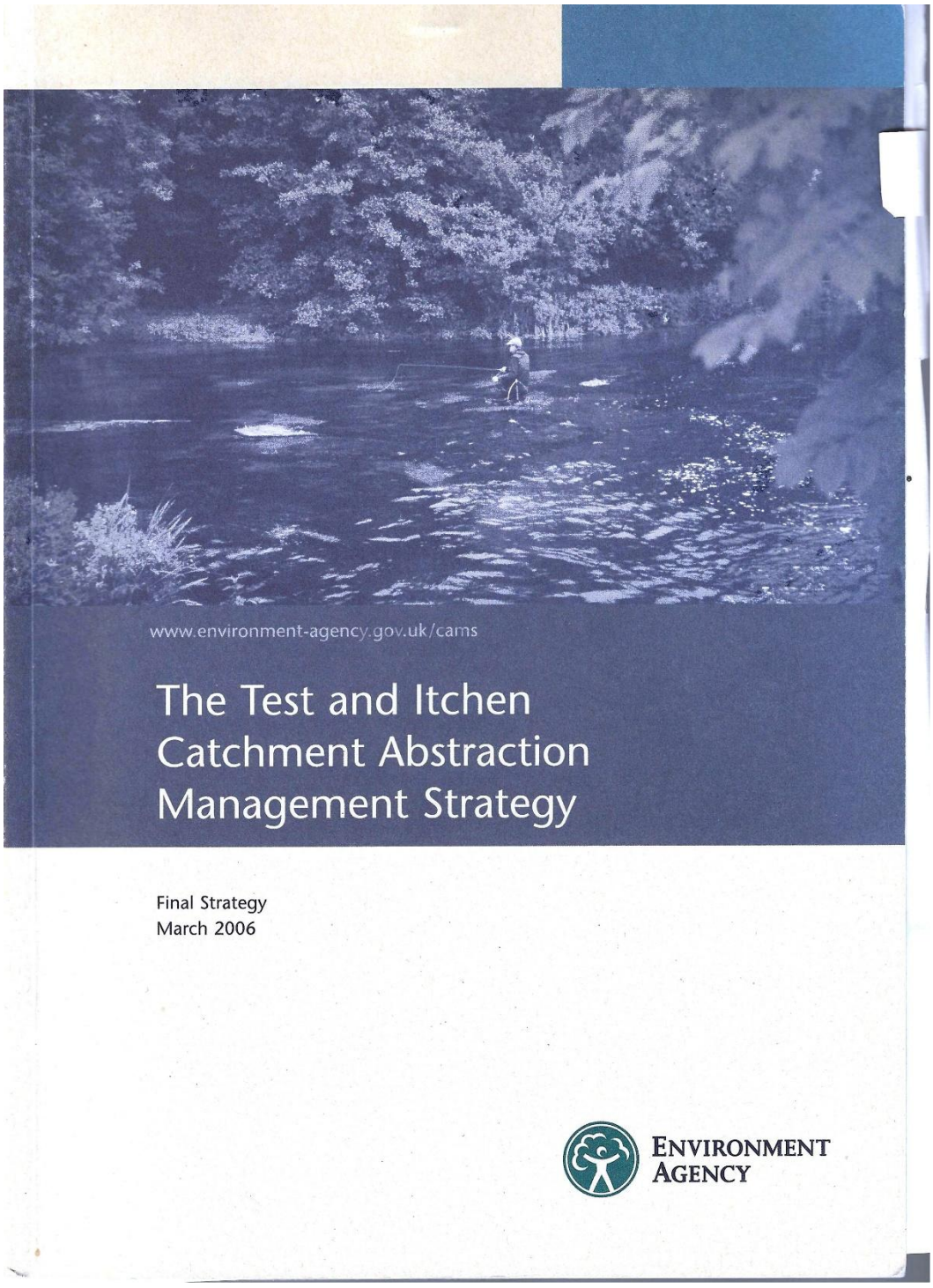
The **river discharge** on 30th September 2026 was 1.912 m^3/s compared to 1.893 m^3/s last year, a difference of only 19 litres/sec so essentially the same. Following some rain in August the flow picked up slightly due to the surface runoff but this has not been sustained and the flow continues to decline.

Overall summary. It has not been a good start to the year, with very low rainfall in September, only 46% of the 7-year average. Groundwater levels and river flows continue to decline and are now at the same levels as last year. **Water conservation measures need to be continued for the foreseeable future.**

Annex A2 The Test and Itchen Catchment Abstraction Management Strategy, Final Strategy, March 2006, Environment Agency

Overview

This document demonstrates the water scarcity situation we have been experiencing in the Test and Itchen catchments over the last 20 years. Table 4.1 shows that all reaches of the Test and Itchen are water scarce. Creation of a reservoir at Havant Thicket, desalination and effluent re-use schemes were presented as future options back then. Arguably, we are 10-15 years behind the curve on initiating these schemes. Sections 3.6 to 3.9 discuss the ecological status of the rivers, with stakeholder concerns in Section 3.10 highlighting concerns over development in the catchments, impacts on water quantity and quality and the effect of low flow on migrating salmon.



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Introduction

Test and Itchen Catchment Abstraction Management Strategy (CAMS).

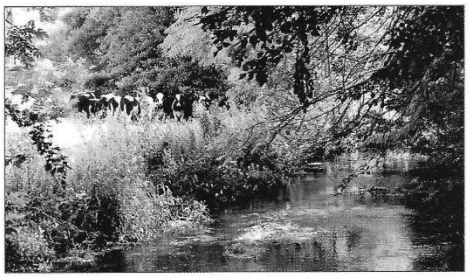
The Vision:

River systems of the highest quality ensuring conservation of the rich diversity of wildlife in the river and wetland environment whilst providing for people's social and economic needs into the forseeable future.

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. It should be noted that CAMS are not intended to directly cover water quality issues but these will be addressed in the forthcoming Water Framework Directive River Basin Management Plans. 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 strategy should be read in conjunction with *Managing Water Abstraction.*

This Test and Itchen CAMS Final Strategy document sets out how much water is available in the catchments and details the Environment Agency's policies and actions relating to the management of this water, over the next 6 years. It is recognised that this first CAMS will not rectify all identified and possible water resource problems for these catchments. However it does describe actions the Agency will take to ratify its findings and work towards possible solutions. It is the third of four CAMS to be produced for Hampshire and the Isle of Wight.



River Itchen near Alresford

A technical document (Final version) for the Test and Itchen CAMS has been produced which provides the detailed technical information on which the development of the strategy has been based.

If you wish to receive this document on CD-ROM, please contact us at the address below. A hard-copy version of the document is also available for viewing at the same office.

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3.7. Status of Ecology and Fisheries

3.7.1. Ecology

The Environment Agency collects and analyses a large amount of ecological information from aquatic habitats within the Test and Itchen catchments. The data is used to monitor the conservation status of several designated species or habitats and to provide an indication of problems in the river related to, for example, water quality or abstraction issues.

Recent surveys have shown that the ecological interest features are subject to a diverse range of anthropogenic pressures including habitat degradation, isolation, eutrophication, abstraction, pollution, disease (crayfish) and predation (water vole). The Agency and other statutory bodies are working to enhance the status of designated species and habitats where they are currently compromised.



Water Crowfoot (Ranunculus) on the River Dun

Nationally recognised procedures have been developed to reliably assess the severity and cause of environmental stress, based on macro-invertebrate and macrophyte community variation. The Agency routinely monitors the invertebrate community at 70 locations in the Test and Itchen CAMS area and the macrophyte community at a further 38 sites.

Recent surveys show that the main channels of the Test and Itchen and their chalk tributaries have few problems with organic or toxic pollution. Although subtle impacts have been detected within close proximity of large Waste Water Treatment Works, cress farms and fish farms, chalk stream sites are generally characterised as having 'very good' ecological quality. In terms of nutrient enrichment there are certainly indications that the Test and Itchen are eutrophic. The impacts of point and diffuse sources of nutrients are currently being assessed in the context of elevated nutrient levels within groundwaters.

Many tributary streams of the Test and Itchen, which flow over Tertiary deposits, often have unacceptable long-term biological quality. Investigations have highlighted several urban and agricultural pollution sources that are currently being addressed through the Agency's Water Quality Improvement Plans.

Where water quality problems are not an overriding issue, ecological quality seems to be closely related to river flows and in particular water velocity. For example, during drought periods such as the early 1990s or 1997 invertebrate abundance and diversity and the status of the macrophyte community were severely impacted.

Information from macrophyte, macro-invertebrate and fisheries surveys has been used to guide the assessment of water resource availability in this CAMS.

3.7.2. Fisheries

River Test

The Test is regarded by many as the world's premier dry fly trout fishery. The fishery provides substantial income for riparian owners as well as employment for river keepers and trout farmers.

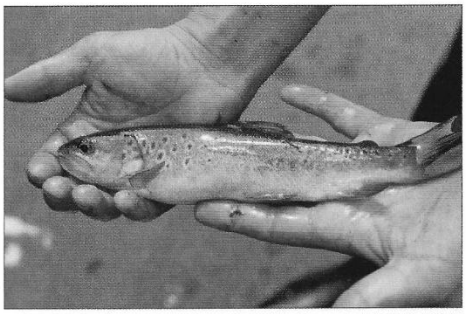
For the last hundred years, the whole river has been actively managed to promote the fishery, with weed cutting and bank-side management designed to provide habitat for fish and access for fisherman.

In addition to the brown and sea trout fishery, the river supports a salmon fishery which is largely confined to the lower reaches of the river downstream of Romsey. Riparian interests also operate several licensed eel traps. Winter grayling and coarse fishing is becoming increasingly popular with more sections providing opportunities for day ticket angling.

Fishery surveys and monitoring work have confirmed that salmonid recruitment takes place throughout the entire system and the river has been classified as a "Native Trout Water" under the Environment Agency's Trout & Grayling Fisheries Strategy. Salmon stocks have been in steady decline over the last forty years, with the river currently failing to meet its conservation objectives which set out to establish spawning targets required to keep the stock in favourable condition.

Key issues impacting the fishery and linked to abstraction are the attractant flows required in the lower River Test to encourage salmon and sea trout to migrate upstream. A comparatively recent change in the distribution of salmon indicates a reluctance for summer run grilse to push up river until autumn flows trigger a spawning migration. The poor survival of salmonid eggs deposited in spawning gravels is considered to be a major impact and is thought to be associated with diffuse pollution which may

be exacerbated by low flows. All surface water abstraction points have the capacity to entrain fry and migrating parr and smolts. All such abstraction points require screening by law.



Wild Brown trout

River Itchen

Like its sister river the Test, the River Itchen has an international reputation as a world-class trout fishery and is classed as a native trout water. The upper reaches above Easton in particular provide some of the best wild chalk stream trout fishing available in the country. Fish populations largely mirror those found on the Test, with a viable salmon fishery established on the lower Itchen below Bishopstoke.

Vigorous flows are required to pull salmon up above the public water supply abstraction points at Gaters Mill and Otterbourne to key spawning and nursery habitats found further upstream. In addition the Environment Agency is currently trying to open up the catchment above Winchester for salmon migration to help stocks meet their conservation targets. Other key fishery issues linked to abstraction on the Itchen revolve around maintaining water crowfoot communities in favourable condition (SAC feature). This is vital to produce optimum fishery habitat as well as providing key habitats for aquatic invertebrates, the adult stage of which are vital in sustaining viable dry fly fisheries.

3.8. Water Quality

The Environment Agency maintains a network of 55 sampling points to assess the quality of 302.8km of classified rivers within this CAMS area. These are used to monitor compliance with statutory standards and discharge consents. This routine monitoring has shown that water quality in respect of these standards is of an excellent standard within the Test and Itchen catchments. Almost 90% of all river lengths have objectives to achieve water of a "very good quality" or water of "good quality" suitable for all fish species. The remaining 10% have objectives to achieve "fair quality" water suitable for high-class coarse fish populations. Compliance assessment, for the years 2000 to 2003, has shown a total (accumulative) length of only 44.2km of river fails its objectives.

Potential impacts on water quality are similar within both catchments. Treated sewage effluent discharged from sewage treatment works for Andover and Romsey influence the downstream water quality in the Test, and Winchester and Eastleigh in the Itchen. In Southampton, wastewater is discharged into Southampton Water and the Solent. There are also a number of treated sewage effluent discharges made to ground in the upper to middle reaches of the two rivers. These recycle water within catchments very efficiently although groundwater needs constant protection against contamination.

Water quality within the smaller urban tributaries can suffer from urban runoff, mis-connections of sewage effluent to surface water drains and illegal discharges. These issues are normally localised and are unlikely to cause water quality in the main rivers to deteriorate. In the upper reaches of the Test and Itchen agriculture, fish farming and watercress growing have the greatest potential to influence water quality. There is also a trade effluent discharge from a paper mill located in Overton that can influence downstream water quality.

The statutory quality standards however only monitor certain chemicals and it is clear that there are reaches of river suffering from other water quality problems not covered. Elevated phosphorus concentrations are normally associated with excessive weed and algae growth that can significantly change river ecology. Phosphorous concentrations are considered elevated in both the Test and Itchen, resulting in their being designated Sensitive Areas (Eutrophic) under the Urban Waste Water Treatment Directive (UWWTD). Phosphorous removal has therefore been installed at Andover WWTW and is planned at Romsey, Harestock and Eastleigh WWTWs. Further improvements to reduce phosphorus concentrations within the rivers may be required under the Habitats Regulations and Crow Act.

In terms of groundwater quality, most of the land use in the Test and Itchen atchments is agricultural, so the main sources of groundwater pollution are likely relate to agricultural activities. The principal cause for concern is diffuse nitrate pollution of groundwater.

The issue of rising nitrate concentrations is currently being addressed through the Nitrate Vulnerable Zones designations and the Water Framework Directive, which is currently assessing the chemical status of all groundwater bodies for a range of different pollutants.

3.9.11. Itchen Navigation Project

The Itchen Navigation was developed over a long period for water mills, water meadows and barge traffic between Southampton and Winchester. It is an integral part of the river system with an important industrial and agricultural heritage and its towpath provides ready access for walkers. A bid for major funding to reverse a century of neglect has been submitted to the Heritage Lottery Fund.

3.9.12. Hampshire Water Partnership

This partnership includes major stakeholders involved in water management at a community level in Hampshire across the private, public and voluntary sectors. It has established a framework for addressing issues facing Hampshire rivers, wetlands and aquifers and organises the annual Hampshire Water Festival.

3.9.13. South East Plan

The South East Plan is the new regional spatial strategy for the South East region and replaces current regional planning guidance. It is a major piece of work being carried out by SEERA and aims to set out a vision for the region through to 2026, focusing on improvements that we need to make to ensure the region remains economically successful and an attractive place to live. It will address important issues such as housing, transport, economy and the environment, including the sustainable use of water resources. The South East is England's largest region, with a population of 8.1 million, and its economic performance is of consequence for the whole country. Hampshire is the third largest shire county, with a growing population of more than 1.7 million people, and the Partnership for Urban South Hampshire (PUSH) proposes a strategy of managed growth, based on the regeneration of Portsmouth, Southampton and other urban areas within the sub-region. The South East Plan contains policies on water resources, water quality and water company infrastructure for which the CAMS will be a building-block. However, these policies will have to be translated into action on the ground to ensure that development is sustainable. Either the new Code for Sustainable Homes will be adopted on a voluntary but universal basis across the region or regulations will have to be rewritten.

3.9.14. Drought Plans

Both the Environment Agency and water companies have drought plans in place to maintain public water supplies and deal with impacts on the environment. These are implemented at times of exceptional shortages of rainfall.

3.10. Stakeholder Concerns

The Test & Itchen CAMS Stakeholder Group members have played a valuable role in providing local information and views from their particular broad interests. They have been briefed at all key stages during the development of the CAMS process raising and debating many important issues relating to the catchments.

Some of the main issues discussed were:

- It was strongly felt that the strategy should directly address water quality in addition to quantity rather than being restricted to flow effects on dilution levels
- Concern about the effect on the catchments of current development and that proposed by the South East Plan
- The level of environmental protection that should be afforded to the catchments reflecting their ecological importance relative to other areas of the country
- Andover WWTW discharging into the main River Test rather than the River Anton depriving it of flow
- Concern that the action plan delivered by the Habitats Regulations Review of Consents could not be incorporated into this CAMS due to a mismatch of timescales
- Whether the 'better science' of the River Itchen Sustainability Study should be used and transposed to the River Test for this CAMS
- The current condition of the macrophyte community and whether it was suffering from lack of flow
- Effect of low flow on migrating salmon
- The complex river system of the Lower Test and the potential impact of the Testwood public water supply abstraction
- The need for the Environment Agency to ensure that strategies and projects affecting the two catchments are linked
- Conflicting views on the state of river management were expressed
- Concern that a winter Q50 condition might affect future WLMPs and agri-environment schemes established to improve floodplain for breeding waders and wetland flora

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, spray irrigation, industrial use, power generation and 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 areas where abstraction needs to be reduced. This does not replace the need for the licence determination process, which is applied to licence applications. More information on the determination process is given in Annexe 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

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.

4.2. Application to the Test and Itchen CAMS

Figure 9 shows the GWMUs and river APs that have been defined for the Test & Itchen CAMS. Further details on how these were defined are provided in the technical document for the Test & Itchen CAMS.

This CAMS has the benefit of two major studies which have helped inform the resource assessment.

4.2.1. River Itchen Sustainability Study

The River Itchen Sustainability Study started to unravel the complex science of determining how much water can be abstracted from the River Itchen without causing environmental damage. It was anticipated that this work would be completed and used in this CAMS. Although considerable progress was made in addressing the issue, it was not possible to definitively quantify the impact. Further work is now being carried out by the Agency as part of the Habitats Regulations Review of Consents process and this work will guide any changes to abstraction licences which are deemed to be required. Best science from the sustainability study has been used where appropriate to inform the resource assessment.

4.2.2. Test and Itchen Groundwater Model

The Agency has developed a regional groundwater model covering all of the Test and Itchen CAMS area. The study has helped the Agency to a better understanding of how groundwater and rivers interact and has also provided assessments of the impact of abstractions on river flow. Although the model provides information for the catchment resource assessments it was not designed to look at local abstraction issues. Where further investigation is identified, the groundwater model will be a useful starting point for more detailed work.

4.3. Resource assessment of river assessment points

4.3.1. Environmental Weighting

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 according to their sensitivity to abstraction, either Very High (VH), High (H), Medium (M), Low (L) or Very Low (VL). If better specific scientific data is available then this can be substituted for these more generic national scores.



Wallop Brook AP at Bossington

Table 3 show the river flow objectives for each assessment point in the Test & Itchen CAMS area.

These 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.

The environmental weighting scores for this CAMS have been based on a rigorous analysis of the available data combined with expert opinion within a national methodology. As a result of this work, the rivers in this CAMS are considered to have high sensitivity to abstraction.

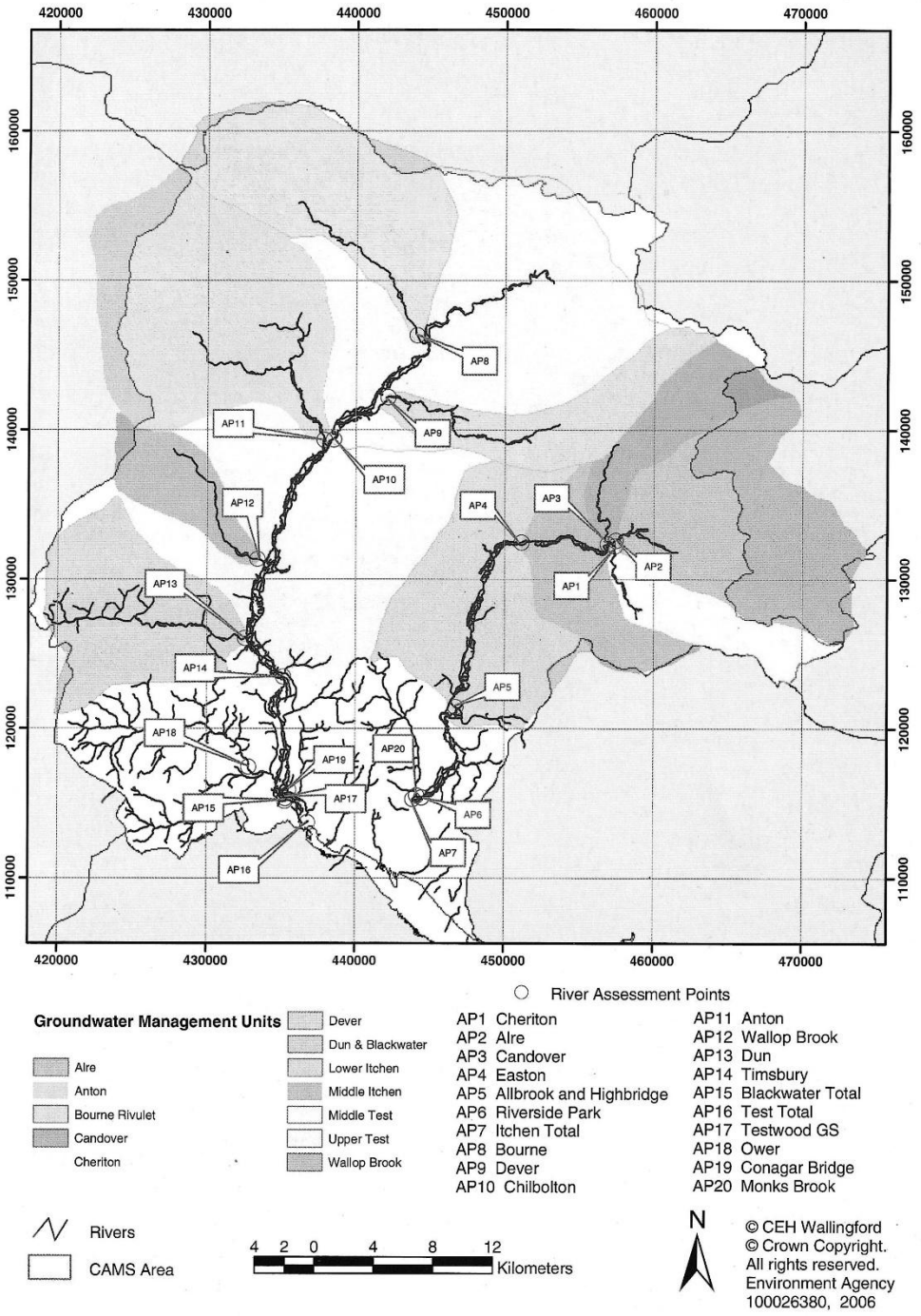


Figure 9 – Groundwater Management Units and River assessment points

Table 3 | River flow objectives

Assessment Point	Assessment Point Name	Main Catchment	Environmental Weighting Score
1	Cheriton Stream at Sewards Bridge	Itchen	High
2	River Alre at Drove Lane	Itchen	High
3	Candover Stream at Borough Bridge	Itchen	High
4	River Itchen at Easton	Itchen	High
5	River Itchen at Allbrook & Highbridge	Itchen	Better science of RISS used
6	River Itchen at Riverside Park	Itchen	Better science of RISS used
7	River Itchen Total	Itchen	Better science of RISS used
8	Bourne Rivulet at Bourne	Test	High
9	River Dever at Bransbury	Test	High
10	River Test at Chilbolton	Test	High
11	River Anton at Fullerton	Test	High
12	Wallop Brook at Bossington	Test	High
13	River Dun at Dunbridge	Test	High
14	River Test at Timsbury Bridge	Test	High
15	River Blackwater Total	Test	High
16	River Test Total	Test	High
17	Great Test at Testwood	Test	High
18	River Blackwater at Ower	Test	High
19	Little Test at Conagar Bridge	Test	High
20	Monks Brook	Itchen	High

The Agency is keen to use the best science available so, although there is no final agreed assessment of abstraction impact on the Itchen, the Sustainability Study represents the best science available at the moment. The Agency has therefore based the environmental weighting for the Lower Itchen on data from the conclusions of the Sustainability Study giving those reaches a lower sensitivity to abstraction. Details of this approach are included in the Technical Document. However, given the current uncertainties and the ongoing work, it is not appropriate at this time to transfer this approach to the Upper Itchen or to the River Test. It is anticipated that the current work will inform the next round of CAMS and may also be used to consider abstraction impacts on the River Test as well as the River Itchen.

4.4. Surface Water Resource Availability

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.

Abstraction licences are sometimes managed in order to ensure this flow variability is maintained 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 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.

The Agency's groundwater model was used to provide assessments of benchmark natural flows and also river flows affected by abstraction.

4.5. 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.

Groundwater is of fundamental importance for this CAMS area. Use of the Test and Itchen groundwater model ensures that the impact of groundwater processes is accounted for in the surface water assessment but groundwater is considered again within five tests. The groundwater model has been used to derive groundwater catchment areas and also recharge estimates.

The groundwater units in this CAMS do not neatly match the CAMS boundary or the internal surface water catchments. The groundwater catchment of the Itchen extends into the Agency's Thames Region around Alton and the groundwater catchment of the River Test extends into the Agency's South West Region around Tidworth. This has been accounted for by using the groundwater model to consider these areas within the resource assessment.

4.6. Integration of the surface water and groundwater resource assessments

The preliminary results for a river reach or a groundwater management unit may be overridden in order to protect a downstream river reach or underlying groundwater management unit. Here the downstream reach or unit is known as the critical reach.

Where the preliminary low flow resource availability status of the river reach or groundwater management unit is "water available", it is overridden to "no water available" in order to indicate that additional abstraction will only be allowed where it does not make the position within the critical reach any worse.

Where the river reach or groundwater management unit is "no water available", "over-licensed" or "over abstracted" it maintains its own status. The strategy that is developed still takes into account the impact that any additional abstraction from these river reaches or groundwater management units has on the critical reach.

Table 4 shows the final resource availability status of groundwater management units and river reaches in the Test and Itchen CAMS area. This is the status following downstream considerations and integration of the groundwater and surface water assessment results. The results of the separate surface water and groundwater assessments are available in the Test and Itchen CAMS Technical Document.

Both the River Itchen and River Test have large abstractions in their lower reaches which cause the lower assessment points of the River Itchen to be defined as Over Abstracted and for the River Test as Over Licensed. These are defined as critical reaches which override the upstream units individually assessed as Water Available or No Water Available.

Table 4 | Final Resource Availability Status Results

Assessment Point and GWMU	Assessment Point and GWMU Name	Main Catchment	Final Water Resource Assessment
1	Cheriton Stream at Sewards Bridge	Itchen	No Water Available
2	River Alre at Drove Lane	Itchen	No Water Available
3	Candover Stream at Borough Bridge	Itchen	No Water Available
4	River Itchen at Easton	Itchen	No Water Available
5	River Itchen at Allbrook & Highbridge	Itchen	Over Abstracted
6	River Itchen at Riverside Park	Itchen	Over Abstracted
7	River Itchen Total	Itchen	Over Abstracted
8	Bourne Rivulet at Hurstbourne Priors	Test	No Water Available
9	River Dever at Bransbury	Test	No Water Available
10	River Test at Chilbolton	Test	No Water Available
11	River Anton at Fullerton	Test	Over Licensed
12	Wallop Brook at Bossington	Test	No Water Available
13	River Dun at Dunbridge	Test	No Water Available
14	River Test at Timsbury Bridge	Test	No Water Available
15	River Blackwater Total	Test	No Water Available
16	River Test Total	Test	Over Licensed
17	Great Test at Testwood	Test	Over Licensed
18	River Blackwater at Ower	Test	No Water Available
19	Little Test at Conagar Bridge	Test	No Water Available
20	Monks Brook at Stoneham Lane	Itchen	No Water Available

4.7. Definition of Water Resource Management Units

The resource availability results for the river reach and groundwater management unit assessments are integrated to produce Water Resource Management Units.

The Test and Itchen CAMS has 9 Water Resource Management Units (WRMUs). These units have been defined to enable the management of water resources and have been derived from the river reaches and associated Assessment Points and Groundwater Management Units used to assess water resource availability. Figure 10 and Table 5 show the Resource Availability Status for each of the WRMUs.

The Candover Stream and Bourne Rivulet are both defined as No Water Available but are not merged with other units of the same status as their assessment points are influenced by significant discharges in the lower reaches of both rivers.

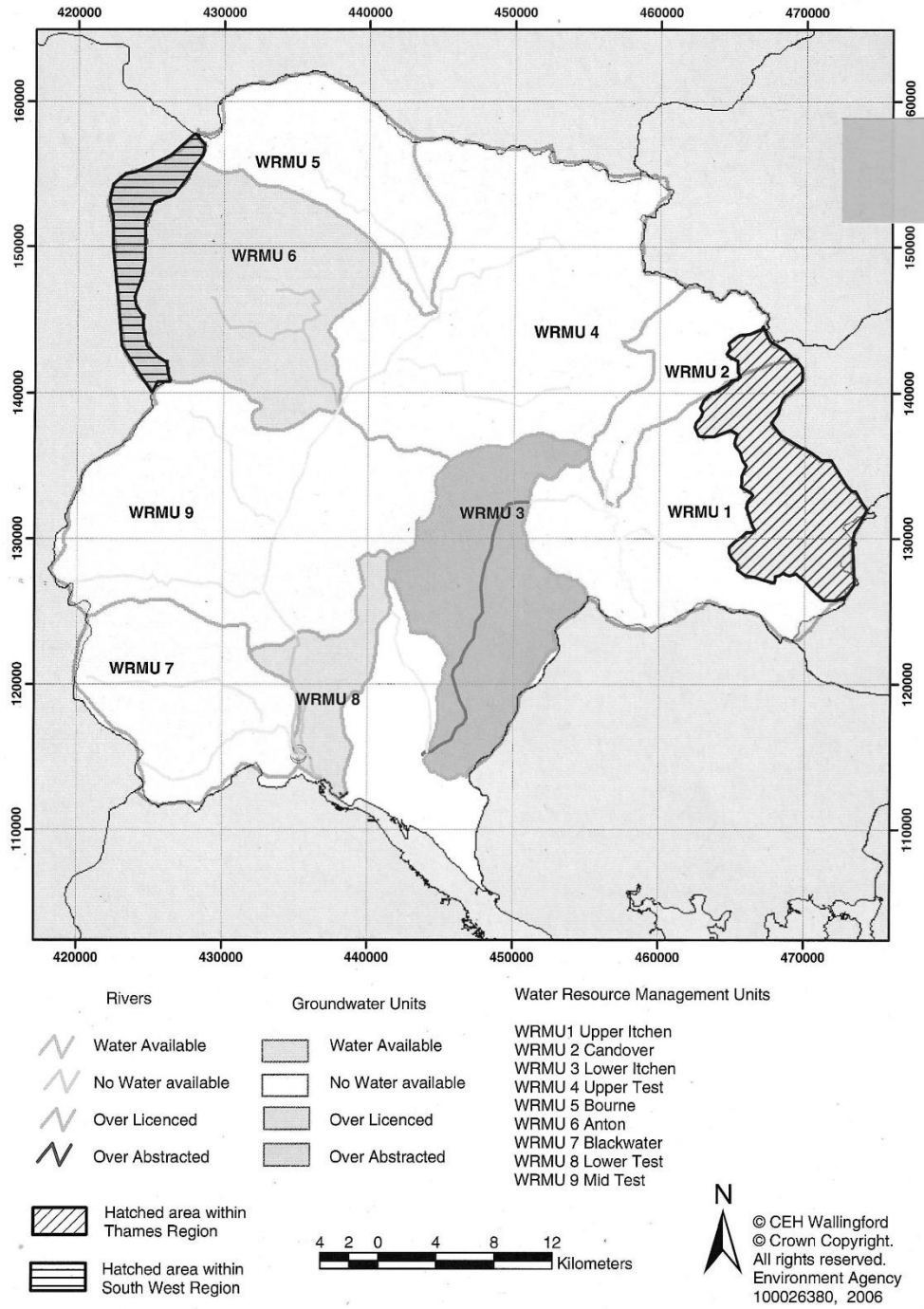


Figure 10 – Water Resource Management Units

Table 5 | Water Resource Management Units

WRMU Number	WRMU Description	Main Catchment	Water Resource Assessment
1	Upper Itchen to Easton	Itchen	No Water Available
2	Candover Stream to Borough Bridge	Itchen	No Water Available
3	Lower Itchen from Easton to Woodmill	Itchen	Over Abstracted
4	Upper Test to Chilbolton	Test	No Water Available
5	Bourne Rivulet to Bourne	Test	No Water Available
6	River Anton to Fullerton	Test	Over Licensed
7	River Blackwater to Testwood	Test	No Water Available
8	Lower Test from Timsbury to Redbridge	Test	Over Licensed
9	Middle Test from Chilbolton to Timsbury	Test	No Water Available

4.8. Areas which are not in Water Resource Management Units

The majority of the CAMS area is within a Water Resource Management Unit. The only notable exception is the Monks Brook in Eastleigh. This is a small urban stream which has no abstractions as it is not a reliable resource. The river has a very small baseflow and responds rapidly to rainfall. It is highly engineered through the urban area and it was not considered necessary to include it within a Water Resource Management Unit. However, the water resources of the Monks Brook have been included in the overall water resource assessment for the River Itchen.

Other streams that the CAMS does not address are the Tanners Brook flowing through Millbrook in Southampton and other small coastal, urban streams. There are no abstractions from these streams.

4.9. Further data needed before the next CAMS

This CAMS has had the benefit of the River Itchen Sustainability Study and a groundwater model for the Test and Itchen. These tools have been important in the completion of this resource assessment. There is still a need for further work to improve the resource assessment before the next round of CAMS. In particular, further work is needed to understand the impact of abstraction on the ecology of particular reaches of both rivers. The detailed work on the River Itchen should be considered in the context of transferring the conclusions to the River Test, a sister river in respects of geology, topography and climate but with differences in scale and management.

6

Future developments in the CAMS area

6.1. Planning Water Resources

The Environment Agency and water companies work together to plan the management of water resources for the future. This results in strategies at a number of levels which include the following:

6.1.1. Environment Agency Strategies

The Environment Agency published National and Regional Water Resources Strategies in March 2001. The National Strategy defines the abstraction licensing framework at high level while the strategy for Southern Region "Water resources for the future – a strategy for Southern Region" identifies a preferred approach to meet the demand for water whilst protecting the environment in Hampshire, Isle of Wight, Sussex and Kent. Each strategy looks some 25 years ahead and considers the need of public water supply, agriculture, commerce and industry as well as the environment. 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.

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.
- Future strategic resource developments should ideally be shared resources benefiting more than one company.

6.1.2. Water Company Water Resource Plans

At the Water Summit in May 1997 the Government set out its expectations for the water industry. The Deputy Prime Minister announced a range of initiatives including leakage reduction and water efficiency measures. To support these initiatives, the Environment Agency asked water companies to prepare water resources plans. These compare and balance the water resources available (supply) against the water required to meet the population's needs (demand) forecast over 25 years.

The first of these plans were submitted as part of the 1999 periodic review process. Companies reported progress annually against these plans to the Environment Agency. The water resources plans were then revised and resubmitted as part of the 2004 periodic review process. The main proposals for Hampshire are summarised in Section 6.4.

The Water Act 2003 amends the Water Industry Act 1991 such that water companies will now have a statutory duty to prepare, consult upon and publish Water Resource Management Plans. Water companies will submit their plans to Ministers in 2009.

The new procedure for the submission of Water Resource Management Plans involves a number of new stages including consultation, consideration of commercially confidential information and publication. Regulations for the plans come into force in November 2006 following the commencement of duty order in October 2006. Companies will produce draft plans for consultation in early 2008 and their final plans by June 2009.

Reductions in abstraction licences required by the Habitats Regulations Review of Consents are a reflection of Hampshire's high quality environment. The Agency's Southern Region is investigating the viability of new or enlarged reservoirs in the region and includes one at Havant Thicket in Hampshire. Together with further work on water efficiency supported by new duties on all public bodies in the Water Act 2003, this is part of the Agency's twin track approach to water resource management.

6.2. Promoting Water Efficiency

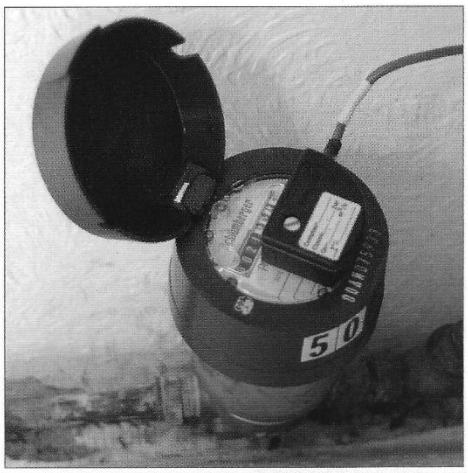
Water efficiency measures help to reduce water demand. As such throughout this CAMS area, the Agency will seek to reduce water demand by promoting water efficiency. This will be achieved through methods, polices and principles set out in the National and Regional Water Resources Strategies. Water companies also have a duty under the Water Industry Act (1991), amended by the Environment Act (1995), to promote the efficient use of water by their customers and ensure that their own use of water is efficient. They also have a new duty under the Water Act 2003 to 'further water conservation' It is clear that there will have to be a change in approach to the use of water in the south-east. In the face of increased rates of development and climate change, new and re-fitted houses will have to be more water-efficient to protect water supplies and the environment. In practice, installing water-saving taps, WCs, showers and washing machines incurs no extra costs and promotes sustainable lifestyles. Standards for the use of water in the home are set out in the emerging Code for Sustainable Homes (based on BRE EcoHomes), but if these measures are not adopted voluntarily by all planning authorities and developers then building regulations will have to be changed.

6.2.1. Water metering

Metering can reduce water consumption by between 2% and 14%, depending upon volumetric charge. The Agency's Southern Region Water Resources Strategy assumes that in 2025 a water meters will be installed in a minimum of 50–75% households in Hampshire. The current take up for Southern Water's Hampshire resource zones combined is around 23% (based on figures for 2004/5 reported in Southern Water's Annual Review submitted to the Environment Agency in June 2005). There is a long way to go to get to the levels that the Agency judges to be necessary to secure long term supplies and help protect the environment. However, the required 2025 metering levels are achievable within the opportunities that water companies have to meter within current legislation.

These opportunities are:

- Provision on request of a free meter
- Metering of new homes
- Metering on change of home ownership
- Metering of users of sprinklers and other unattended watering devices
- Metering of houses with swimming pools
- Compulsory metering, if "water scarcity status" is applied for by a water company and approved by the Secretary of State



Domestic water meter

6.2.2. Leakage

All water companies operating in this CAMS area have achieved their Ofwat leakage targets. The National and Regional Water Resources Strategy expects further economic leakage control progress to be made through the next 25 years.

6.2.3. Building design

Improved water efficiency should be a key component of all new housing developments, because on average only 3% of all household water consumption is actually for drinking. House builders can help reduce water consumption by installing water efficient domestic appliances, bathroom fittings and rainwater storage systems.The Office of the Deputy Prime Minister (ODPM) is currently reviewing a requirement that all new buildings should be designed and equipped to enable them to save around 20% of per capita consumption, within a revised 'Part H' of the buildings regulations.



New house building

Sustainable drainage systems (or SUDS) is the practice of controlling surface water runoff as close to its origin as possible, before it is discharged to a watercourse or the ground. This involves moving away from traditional drainage systems to softer engineering solutions. The benefits are reduced flood risk, improved water quality and increased groundwater recharge. This water can also be collected and reused for non-potable purposes.

6.2.4. Water Audits

All businesses can use their water wisely. By investing a little time and money in implementing a simple water management plan, an organisation may reduce its water consumption significantly, releasing money to be invested in other parts of the business and establishing 'green' credentials. Water audits allow the volume of water used during an average year to be calculated and suggest ways to reduce water use and therefore costs. For more information on how you can save water, either at home or at work, please refer to the Appendix 1.

6.3. Climate Change

Climate change is an important issue facing water resources management. The latest climate change scenarios from the UK Climate Impacts Programme suggest that temperatures will rise across England and Wales. By the 2050s, in southern England summers will become drier and winters will be wetter. This has important implications for water availability, as it will change groundwater and river regimes. For instance, rainfall is becoming both more seasonal and of increasing intensity, which could lead to higher runoff and less water able to percolate into the aquifers which supply the bulk of public water supply in this area. It is likely that direct abstractions will become less reliable in summer, which means that farmers and industries who rely on them will have to consider adaptation, including the option of using water efficiently. The impact on public water supply is less clear but recent modelling work suggests that the deployable output of some systems will be reduced. For more information on the Agency's ongoing work on climate change, please refer to Appendix 1 of the Regional Water Resources Strategy. More details on climate change scenarios are available at www.ukcip.org.uk/scenarios.

6.4. Water Resource Schemes relevant to the Test and Itchen CAMS Area

Water Company water resource plans submitted to the Environment Agency in March 2004 provide the current basis of understanding of the public water supply demand balance and potential future water resources schemes.

6.4.1. Strategic Public Water Supply Transfers

The largest consumptive abstractions from the River Test and River Itchen are for public water supply. The water abstracted is not simply used within the catchment but also forms part of the larger Hampshire and Isle of Wight area water supply system. The main public water supply transfer operations affecting the Test and Itchen catchment are summarised below and shown in Figure 30 (A more detailed technical summary is available in the Technical Document).

Portsmouth Water Abstraction

Portsmouth Water is licensed to abstract up to 45 Ml/d from the River Itchen at Gaters Mill, although the average abstraction is 30 Ml/d (and has been less in recent years due to water quality issues). Once treated the water is transferred to the 'Gosport & Waterlooville' water resource zone of Portsmouth Water. The water company also has connections for an emergency backup to its Portsmouth and Havant Water Resource Zone.

The Cross Solent main

Southern Water operates this pipeline which currently has the capacity to transfer up to 11.85 Ml/d under the Solent from 'Hampshire South' to 'Isle of Wight' resource zone. The transfer is used to support a limited availability of water on the Isle of Wight. The supply comes from the River Test at Testwood and equates to 5% of the current available supplies of Southern Water's 'Hampshire South' zone.

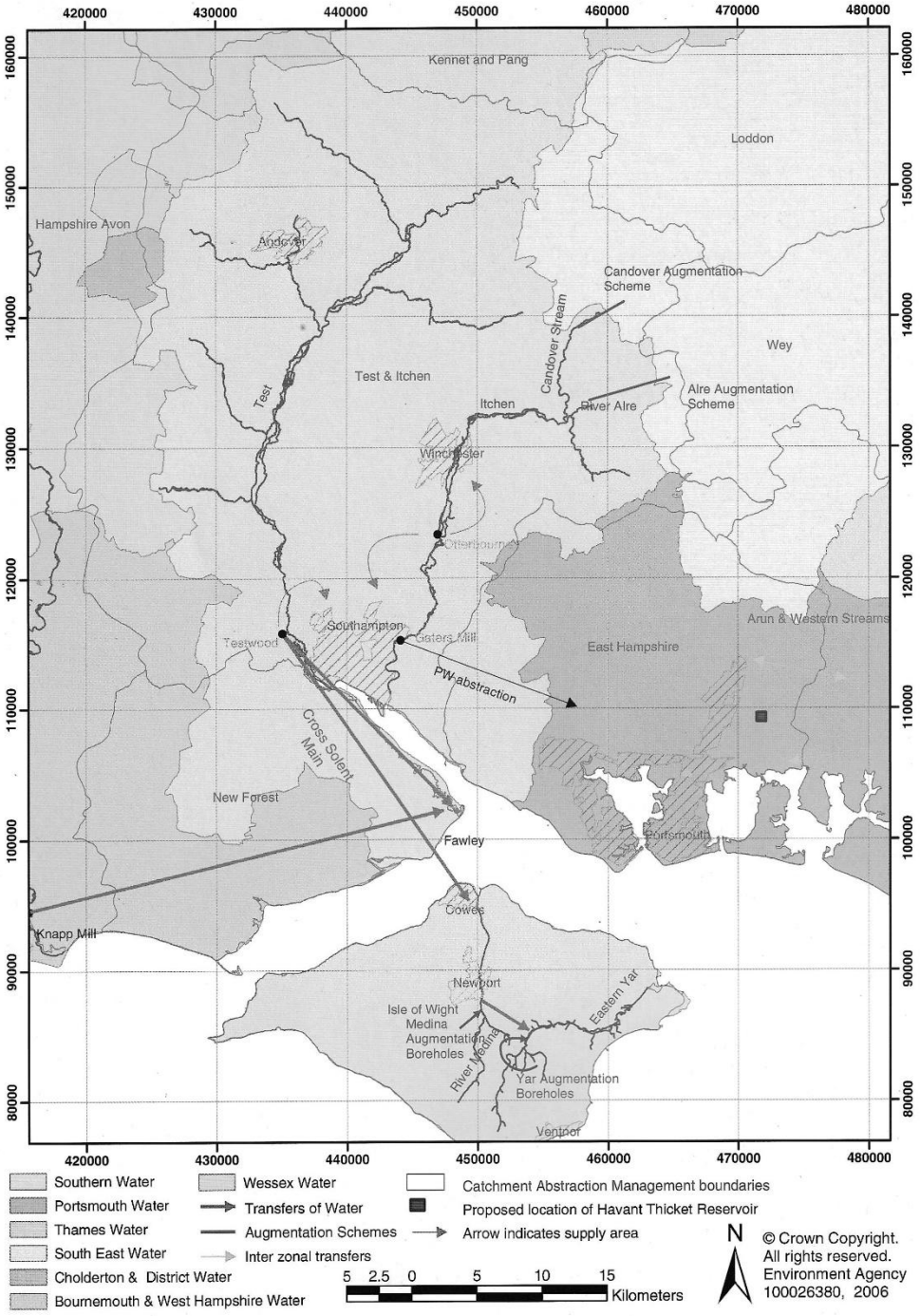


Figure 30 – Main Public Water Supply Transfers

Esso reserve supply

Southern Water reserves 22.7 Ml/d from Testwood for the Esso refinery at Fawley. Bournemouth and West Hampshire Water are the main suppliers to Esso. The Southern Water reserve has occasionally been called upon to supply 8 to 12 Ml/d.

Candover & Alre Augmentation Schemes

These schemes are detailed in section 3.5.

6.4.2. Future options

Following assessment of forecast growth in demand and potential reductions in water available, the Agency and water companies are considering the following schemes which are relevant to this CAMS area:

- Increasing the capacity of the cross-Solent main from Testwood to the Isle of Wight
- Removing operational and process constraints and reducing process losses at waterworks
- Increasing treatment capacity at Testwood
- Increasing licence at Testwood
- Reducing abstraction at Otterbourne to meet the needs of Habitats Regulations Review of Consents
- Desalination
- Effluent re-use schemes
- Creation of a reservoir by Portsmouth Water at Havant Thicket potentially allowing water to be transferred to neighouring water companies