



## WATER RESOURCES FACT FILE 7/9

*“Water, water everywhere,  
nor any drop to drink” –  
Not if we have anything to  
do with it!*



ENVIRONMENT  
AGENCY

"We also receive valuable guidance from the Thames Regional Environment Protection Advisory Committee. Membership is drawn from a wide range of local and national bodies. Meetings of this committee are open to the public."

# the environment agency

The Environment Agency for England and Wales is one of the most powerful environmental regulators in the world. It provides a comprehensive approach to the protection and management of the environment, emphasising prevention, education and vigorous enforcement wherever necessary. The Agency's creation on the 1st April 1996 was a major step, merging the expertise of the National Rivers Authority, Her Majesty's Inspectorate of Pollution, the Waste Regulation Authorities and several smaller units from the Department of the Environment.

## Thames Region

England and Wales are divided into eight Environment Agency regions. Thames Region is responsible for the protection of a 13,000 square km area of great diversity. The Region extends from Cirencester in the west to Southend in the east and from Luton in the north to the Surrey Downs in the south. Because this area contains a fifth of the nation's population, development pressures and demands on natural resources, particularly water, are greater than elsewhere in England and Wales. Thames Region is subdivided into three areas (West, North East and South East) which are the first point of contact for local issues.



Water Resources, the subject of this leaflet, is one of our key responsibilities. The others - Flood Defence, Conservation, Fisheries, Navigation, Recreation, Water Quality, Waste Regulation and Integrated Pollution Control - are covered in separate leaflets. In reality, we can't treat these responsibilities separately. Whatever we do must be done in the context of the whole catchment.

This means that the work of one specialist department is best carried out in collaboration with all the others. (So it's a good idea to read all the leaflets, and not just this one. In that way you'll get a better understanding of what we are trying to do).

## We can't create water

There is no practical alternative to making the best use we can of the water that falls from the skies and ends up in the rivers, streams and underground aquifers.

'Seeding' the clouds to trigger rainfall is not a practical proposition. Taking the salt out of sea water (desalination) is very expensive.

So we must eliminate all waste in the ways we collect, store and deliver the water...and in the way we use it.

In Thames Region, the problem is given a further twist. Not only do we have the highest density of population and therefore the highest demand for water, we also have the second lowest annual rainfall of any part of the country.

## If water comes from heaven, why do we have to pay for it?

Rain is free, but tapwater costs money, as does all the water used by industry and agriculture. Why?

There are three main reasons:

- It costs money to deliver the water to the consumer.
- It costs money to ensure that the water is of sufficient purity.
- It costs money to ensure that there is always enough water to go round.

Many licences are now granted for a limited period of years - so that we can check whether they have any adverse effects or not. At the end of the licensed period, the abstractors must submit a new application and justify their need to continue abstracting.

An abstraction licence always states how much water the licence holder can take, where from and how often. And we can impose special conditions.



For larger abstraction applications, we will almost certainly require some kind of environmental assessment to be made. In other words, we need to know the likely effect of the application, if successful, on wildlife and habitats. We may require the licence-holder to construct a pond or reservoir in which water can be stored in winter, and from which it can be used in the summer. In addition some licences may be only operative when river flows are above a healthy level.

The largest abstractions are made by water companies and industry. We regulate some activities of the water companies operating in our Region, including Thames Water, Three Valleys, Sutton and East Surrey, North Surrey and Mid-Southern Water. We control their abstractions from rivers and underground aquifers and, in the case of Thames Water, discharges from their sewage treatment works (at all times protecting water supplies from pollution).

Farmers can be big users in dry weather when they want to use water for irrigation. However, on average throughout the year, only about 6% of water abstracted is used for agriculture and most of that is for fish-farming and water-cress growing which, unlike irrigation, consume very little water.

#### 'Consumed' or returned

Before we grant an abstraction licence and specify how much water can be taken, we need to know whether the water will be 'consumed' or returned to the local environment and river system as effluent.

Some uses, such as spray irrigation and some industrial processes, are mainly consumptive - i.e. a large proportion of the water is 'lost' to the atmosphere.

Fortunately, the water taken by most major abstractors is returned. About 85% of all water abstracted in Thames Region goes to public water supply, and upstream of London about 80% of that is returned to the local river system and, mixed with natural water, can be re-used. However in London, by far the biggest demand centre, no water is returned; all the effluent from London goes out to sea through the estuary.

#### Self-financing

Licence-holders have to pay us for their licences. We raise around £10 million a year in this way, which makes the Water Resources function in Thames Region (and all other Regions) self-financing. Most of the money we take goes on current expenditure - that is on staff and on studies, research and data collection for all the activities that are necessary for good management of water resources. About £1 million is spent on capital items, such as gauging stations for measuring river flow, bore holes for checking groundwater levels and schemes to restore flow to rivers badly affected by abstraction.

#### Good housekeeping

Water resource management can, with justice, be described simply as good housekeeping - making the very best of what's available. Good housekeeping is essentially a cooperative affair - in our case, cooperation between the "providers" (the Environment Agency) and the "users" (most often, the water companies). We must ensure that water is put to good use, that river flows are monitored, and that the water environment is protected.



## Five river exercise

Some of the abstractions taking place under 'Licencing of Right' are now having a damaging effect on several of our rivers. In the most severe cases, in cooperation with the water companies who hold the licences, we have set up major projects to restore some of the lost flow.

Five rivers have been severely affected by abstractions taken under 'Licences of Right' - the Ver, Misbourne, Pang, Wey and Letcombe Brook.

The Ver (shown on the front cover), which runs through the Chiltern Hills, had lost 70% of its water to the public water supply, and some 10 kilometres of the river actually dried up. Abstraction has now been substantially reduced and as you can see, the flow has been significantly improved.

The Misbourne also runs through the Chilterns. It has always had low flow problems, made worse by the abstraction of



about 65% of its available water. We are working to restore an acceptable flow by helping the companies concerned to obtain alternative supplies.

The Pang (shown above) joins the Thames at Pangbourne. Abstraction was taking 35% of its available water - this has now been reduced to 12% and river flows are much healthier.

The north branch of the Wey in Hampshire was losing 65% of its available water. With the local water company we are again looking for methods of reducing abstraction.

The Letcombe Brook, a tributary of the River Ock in Oxfordshire, was losing some 35% of available water to the public water supply. The abstraction continues, but at a low level. When necessary, additional water is pumped into the stream from a more distant borehole.

These 'case histories' indicate our tactical response to low-flow problems. Our long-term strategy is to tackle all serious low-flow problems caused by licensed but excessive abstraction of water and remove the problem once and for all.

## Water futures

Forecasting future water needs and matching them to likely future water supply are both of critical importance.

Future weather patterns are difficult to anticipate. We can hypothesise (or guess) but do not know for certain whether the rainfall patterns of the past will be repeated in the future. However, we shall continue to extend and improve our already extensive network of monitoring facilities. These give us continuous measurements of water levels in our rivers and underground aquifers. We shall also continue to develop techniques enabling us to gain more usable information and guidance from all the data we gather.

Our cooperation with other organisations concerned with rainfall and climate will continue. We need to know all we can about the likelihood of climate change, the forms it might take and the impact on future water supply.

## Fewer leaks, less waste

Water demand is linked to economic activity. In a recession, less water is used. When business picks up and more people are better off, the demand for water rises.



Daily consumption of water in the Thames Region is about 151 litres per head. We reckon that the growth in consumption will be less rapid than in the past. At the most, the rate should only be a little more than 1% per year but it could be even lower.

There are two main reasons now for anticipating a slowing down in growth:

- The water companies are reducing the amount of water lost through leakage.
- People generally are using water more wisely - often with the help of appliances that are more water-efficient.

In the future there could be a third reason - 'metering'. 'Metering' means that people

pay only for the water they use instead of paying a fixed rate. Currently fewer than 5% of households in Thames Region pay by meter. This percentage could increase very significantly - to 25% or even much more.

## Saving for a non-rainy day!

Reservoirs have a vital part to play in the overall water resource strategy. The Environment Agency is not directly involved in the planning, building and operating of reservoirs. That is generally the responsibility of the water companies. But we are certainly consulted in the planning of such schemes and assessing their impact on the water environment.

## A major example is now in the making

Thames Water are investigating a major new reservoir near Abingdon in Oxfordshire. Its surface area would be 10 square kilometres (a quarter bigger than Derwentwater in the Lake District) and it would hold 150 million cubic metres of water.

Thames Water is carrying out a major Environmental Impact Assessment of the scheme. The Agency will have grant the necessary abstraction licence, discharge consent and land drainage consent. To do this we will have to assess the effects on the water environment, on water quality, fisheries, land drainage and wildlife. We will have to be satisfied that the reservoir is needed and that it will produce overall benefit to the water environment.

## To Thames from Severn (and East Anglia too)

But with an item as vital to life as water, no-one can rely completely on forecasts. So we are investigating new schemes which could be implemented if more water supplies are needed.

The new reservoir in Oxfordshire has already been mentioned. Other proposals involve the transfer of water from the river Severn and from rivers in East Anglia into the Thames Region. Natural groundwater reservoirs under London could also be recharged artificially during times of high rainfall and used in times of drought.

Whether these and other schemes are in fact implemented will depend not only on future levels of demand, but on environmental impact, cost and technical feasibility.

Our overriding aim will remain. We have to ensure that there will always be 'water, water everywhere' - wherever and whenever it's needed - in our Thames Region.

The job of delivering water to the customer is the responsibility of the water companies.

The job of ensuring that the water is of sufficient purity is shared between the water companies and the Environment Agency: the Environment Agency is responsible for maintaining the quality of water in the rivers and underground aquifers (natural reservoirs) from which the water companies draw their supplies.

The job of ensuring that there is enough water to go round for users and for the environment falls on the Environment Agency alone, in particular on Water Resources.

### Where does all the water go?

Everyone and nearly everything needs water - and for so many different purposes. That is the problem. Rivers and groundwaters everywhere have to meet a multitude of often conflicting needs, and in Thames Region, with its concentration of industry, agriculture and people, the needs could easily become overwhelming.

Just consider the demands made on the rivers:

- They act as a vast and complex drainage system. If we interfere with that system, we run the risk of damaging it. If we damage it we could end up with waterlogged land and continual risk of flooding.
- But our rivers also act as a vast waste disposal system. They dilute and dispose

of all kinds of manmade effluent, taking it conveniently out to the Thames Estuary and the sea.

- Our rivers, streams and aquifers are the only source of drinking water.
- Rivers and streams offer food and homes to many different kinds of wildlife.
- They are highways for all kinds of river traffic.
- And people look to them for recreation and as a never-failing source of beauty and delight.

Our responsibility is to assess the needs of each of these uses in a given situation, and try to arrive at a balance that is satisfactory all round.

We must also remember the principle of 'sustainability'. Is the balance that we create today likely to affect the chances of achieving acceptable balances in the future? This requirement compels us to adopt a "play safe" or "precautionary" attitude in considering whether to allow an abstraction or a discharge.

### Making the water go further

The tendency in the not-too-distant past was to think of water as a free commodity in endless supply.

No-one can be in any doubt now that water is not free, and that bringing it to the point of use in good condition costs money.

But in a country with many different words to describe rain, we still tend to think of water as inexhaustible. The severe drought of

1976 helped change some attitudes but our expectations of the service provided by privatised water companies has also changed in recent years. Nevertheless, the effect of old habits still lingers, most of all in the inefficient way that we use water, both at home, in the factory and on the farm.

The Environment Agency puts great importance on promoting more efficient ways of using water - as set out in 'Saving Water' and the Government publication 'Using Water Wisely' (DoE 1992).

Ensuring water companies have plans to control and reduce the water leaked from the distribution system is fundamental towards securing the proper use of our water resources.

But in addition, we all need to use water wisely, especially during drought periods, to ensure we only take from the environment what we need.

### Data chain

We need to gather a great deal of data about water quantities - how much rain falls; how much is lost through evaporation and transpiration (the loss of water to the atmosphere through plants); how much enters the underground reservoirs (known as 'recharge'); and how much is carried in streams and rivers.

The quantities are far greater in winter than in summer. After a dry winter, when the aquifers and hence the rivers are less full, there will be an overall shortage of water - or at least there would be without manmade reservoirs. During a drought, we must watch the quantity of water in rivers and aquifers very carefully. We discuss with the water companies the need for restrictions - such as hosepipe bans - and can ourselves impose restrictions on quantities used for irrigation, whether for crops or golf courses!

### Abstraction art

'Abstraction' is the term used to describe the act of taking water in quantity from natural sources - usually by pumping, sometimes by gravity. To achieve the right balance between the needs of abstractors and those of the environment, our main tool is the 'abstraction licence'.

Licensing of abstractions was introduced by the 1963 Water Resource Act. The Act acknowledged existing obligations to many abstractors, who were granted 'Licences of Right' in perpetuity.



## MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

Head Office is responsible for overall policy and relationships with national bodies including Government.

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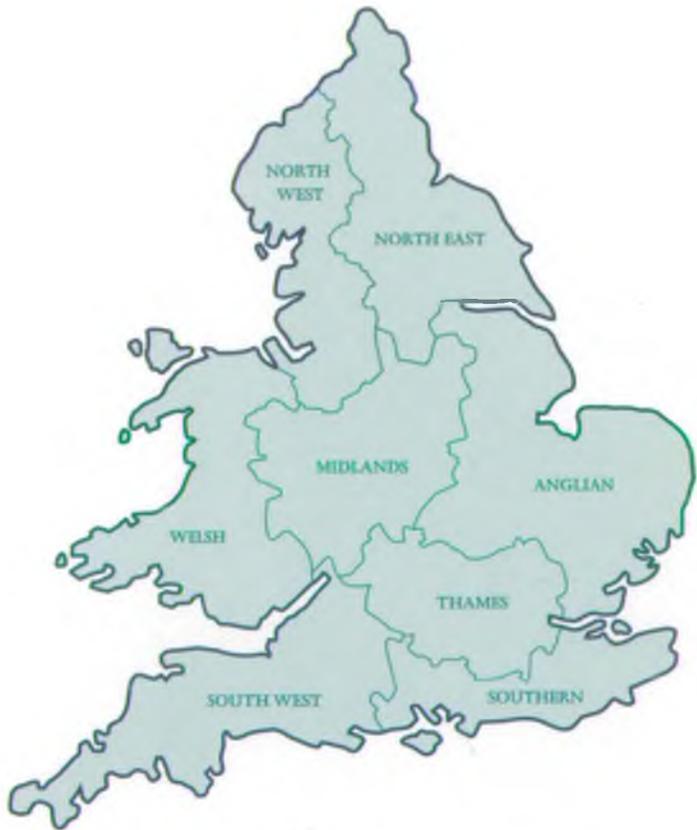
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Environment Agency  
Information Centre  
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ENVIRONMENT AGENCY



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For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

ENVIRONMENT AGENCY  
GENERAL ENQUIRY LINE

**0645 333 111**

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

ENVIRONMENT AGENCY  
EMERGENCY HOTLINE

**0800 80 70 60**



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