

Lords set up water management inquiry

The House of Lords Select Committee on Science and Technology has set up a sub-committee to inquire into aspects of water management in England and Wales. The enquiry opens with a seminar on 17 October.

The chairman of the sub-committee, the **Earl of Selbourne** said that "water shortages are increasingly part of our everyday lives. If we are to avoid graver problems in future we must plan ahead and consider changing demographics, economic development, the framework for investment by the water industry, and water to manage demand and to reduce the colossal waste of water".

He said that they will be "looking critically at ways the Government and its various departments and agencies are tackling these issues, and at whether or not there is a properly joined-up approach to water management. We will be looking in particular at how science, engineering and technology can contribute to more sustainable long-term water management".

He confirmed that the "need to consider climate change, and the effect of more and more hot dry summers on both water supply and demand".

Questions

The inquiry will also try to answer the following questions:

- is the legislative and regulatory framework, at national and European levels adequate?
- how does water figure in the development of Government policy in areas such as housing, land use planning and industry?
- what can the UK learn from the experience of other countries?

The committee's specialist advisor is **Professor Richard Ashley** of Sheffield University.

WDM body for US?

The latest **Wiserwatch** news (www.awwa.org/waterwiser/watch) includes progress on establishing a **National Water Efficiency Organization**.

With support from the **US EPA**, the **Californian Urban Water Conservation Council** is developing a framework for this national partnership on water use efficiency, similar to existing national organisations such as the Consortium for Energy Efficiency.

It is expected to "develop cross-state initiatives, conduct needed water efficiency research, co-ordinate water efficiency project partners, and generally serve as a clearinghouse for water efficiency progress and cutting edge change".

Wiserwatch news also gives details of the water conservation measures in the **US Energy Bill** and notifies that the February Journal **AWWA** will have water conservation as its focus topic, timed for the **Water Sources** conference in Albuquerque.

You can follow progress, and sample the results of a questionnaire on the national body via www.cuwcc.org

Waterwise to increase WDM action

The UK's water companies are funding a new organisation, **Waterwise**, targeted to reverse the trend in rising demand and reduce stress on the supply-demand balance in the UK over the next five years.

Beginning its work on 1 September and due to act 'independently', **Waterwise's** prime aim is to "increase demand-side action to meet public supply needs".

It also aims to:

- make the economic case for water efficiency as a realistic, large-scale contributor to sustainable water resources
- build links between water efficiency and affordability

- promote the social and environmental benefits of water conservation.

Waterwise Director, **Jacob Tompkins**, said that "Waterwise is a co-ordinated approach to water efficiency. We will use collaboration and sharing best practice to build a strong business case for large-scale water efficiency projects. This isn't about constraining lifestyles but using new technology and education to improve living spaces and add value to the built environment".

Nicci Russell, former advisor to Margaret Beckett, is Head of policy and **Brian Hooper**, fresh from South West Water and Chairman of the **WATERSAVE** Network, is Senior Consultant and will liaise with water utilities.

Waterwise will be consulting NGOs, water industry representatives, Defra, Ofwat, the Environment Agency, the Consumer Council for Water and other stakeholders in water efficiency as it develops its business plan over the next six months.

The official launch will be by **Elliot Morley** and will take place on 2 November at 10am at the House of Commons. By then **Waterwise** will have its own website – www.waterwise.org.uk.

For further information, contact the Programme Manager, **Melanie Cooper**, on tel: +44(0) 020 7344 1838 or email: mcooper@waterwise.org.uk

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Droughts in a cold climate

The are changes being made to drought planning and management in England and Wales. **Dr Glenn Watts**, Water Resources Strategic Planning Manager, Environment Agency gives the background.

It is hard to persuade people that drought can be a real problem in England and Wales. Everyone knows Wimbledon's always wet, Glastonbury is a mud festival, cricket test matches never finish, and barbecues end up indoors. Yet we all carry a memory of the long hot summers of childhood – endless days sweltering in the classroom followed by weeks in the sun.

There's an element of truth in all of this. We really do have a variable climate that normally gives plenty of rain and sun, but some years are dominated by dry weather.

Water resources planners know that, even in England and Wales, droughts can cause real shortages of water. In 1976 we were urged to bathe with a friend, and there was even a Minister for Drought. This year, the driest winter and spring in 30 years has led to hosepipe and sprinkler bans across much of south-east England.

Our water supplies are designed to cope with long periods of dry weather. Computer models allow water companies to test systems against the notable droughts of the last century – not just 1975-76 but droughts that are almost beyond living memory, like the exceptional summer of 1921.

2 During a drought, there are always difficult decisions to make. Water companies need to make decisions about how they balance different sources of water, when to implement customer restrictions like hosepipe bans, and when to apply for permission to take extra water from rivers and groundwater.

Good planning for droughts is essential. Since 1999, water companies have submitted drought plans to the Environment Agency. These operational plans show how the companies will make decisions as a drought progresses. They

include details of possible applications to take more water from rivers and groundwater, as well as the management structure that the company will use during the drought.

Thinking and discussing in advance means that problem areas can be identified and further work can be carried out.

The Water Act of 2003 made drought plans mandatory. This autumn, the water companies of England and Wales will start developing new drought plans. Ultimately, these will be submitted to Government.

Public consultation

For the first time, the plans will undergo public consultation. Anyone will be able to comment on any aspect of the draft plans. We expect people to be especially interested in decisions about customer restrictions like hosepipe and sprinkler bans.

There may also be much discussion of proposed drought permits and drought orders – the legal applications to take more water from river and groundwater than is normally allowed.

Government may decide to hold a public hearing about the plan. This will help Ministers to understand the comments that have been made and to hear the water companies' views on these. If necessary, Ministers can direct the company to change parts of its plan.

Public scrutiny is new and may seem unpredictable, but should result in robust drought plans with a higher profile. People will understand drought decisions, and will know what to expect in the next drought. That can only be good news for everyone with an interest in water management – and when it's dry, that's all of us.

Table 1 Water restrictions in force – end August 2005

Date	Company	Restriction	Area	Affected
10 June	Southern Water	Hosepipe ban	North Sussex	107,000 homes
11 July	Mid Kent	Sprinkler & hosepipe ban	Whole area	218,000 people
11 July	Southern Water	Hosepipe ban	Sussex Coast	243,000 homes
		Sprinkler & hosepipe ban	Kent Medway, Thanet Hastings	275,000 homes 51,000 homes
11 July	South East Water	Sprinkler & hosepipe ban	West Sussex Forest Row in East Sussex	138,000 people
26 July	Southern Water	Drought Order	Weir Wood reservoir	

German surprise

Meanwhile, a couple of surprising press releases from Germany of all places. The Vice-President of the Federal Association of the German Gas and Water Industries (BGW), **Peter Rebohle** was quoted as saying "in Germany, saving water makes neither economic nor ecological sense ...

wanting to make massive water savings causes problems on the network which then require expensive solutions".

At the same time health authorities in Germany issued a nationwide press release with a plea "to start wasting water – to keep water supply systems from becoming stagnant".

Germany has not had a proper drought in recent memory.

Drought elsewhere

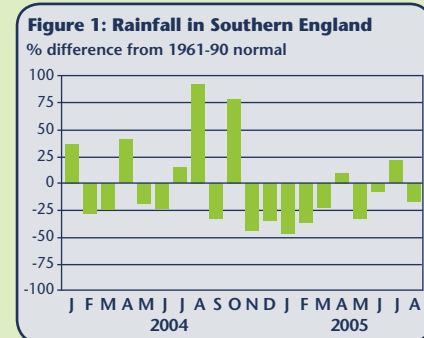
Things are much worse in France and particularly so in Spain and Portugal. There has been negligible rain over the Iberian Peninsula over the summer months.

Indeed the main media attention has been more on the extensive forest fires and the agricultural crisis than on the water shortage in the last couple of months.

One item that has gained media attention was typified by the headline *Spain's Eco-Golfers now to Drive the Brown in the Guardian* on 10 August. There are more than 20 water-guzzling golf courses a year being built for tourists on the Spanish Costas, not to mention the record 700,000 homes reportedly built last year. **Peco Lopez**, a sports lecturer, has designed the country's first water free golf course. But will it catch on?

The Azores high pressure has been strong, diverting the westerly winds further north before plunging down into central and eastern Europe causing major flooding especially in Germany, Switzerland and Bulgaria.

Meanwhile, in the UK the rainfall over southern England, despite a number of very heavy thundery downpours has been close to average over the summer months as shown in figure 1.



Mott MacDonald in China

Mott MacDonald have been awarded a DFID funded *Water Demand Management Assistance Project* to be implemented by the Chinese government through the Ministry of Water Resources. The case studies being carried out are a mixture of integrated water resources management and demand management.

Third stage in Saudi Arabia

The **Ministry of Water and Electricity** has launched the third stage of a nationwide campaign aimed at encouraging Saudis and expatriates to rationalise water consumption. Four million items of water saving equipment and accessories were distributed during the first two stages. This stage will concentrate on apartments, compounds, hospitals, hotels, commercial establishments, government and private schools.

Metering's opportunities and challenges

The recent Society of **British Water and Wastewater Industries/WRc National Conference on the Future of Domestic Metering for Water Customers** was very timely as the recent dry weather has raised the profile of water metering.

The Chairman for the day, **John Batty** of Bluejohn Marketing, set out the issues in a series of straightforward observations and questions.

"Water debt in the UK is nearly £1bn. Almost one in five families owe money to their water company and the water industry is the single largest user of the court system in the UK with almost 250,000 claims per year. Sadly, less than 3 per cent of eligible households have successfully claimed the 'hardship relief' on offer.

According to WaterVoice's evidence to a Defra committee, a single pensioner on pension credit with an unmetered supply in the South-West of England will – by 2010 – be paying 11% of his disposable income in water and sanitation charges.

An OECD report states that water charging in the UK is more regressive than in any other country studied – with the exception of Mexico.

Depending on what you read, in the 1990s per capita consumption of water in the UK increased between 5 and 10 per cent and over the past 30 years the figure is nearer 70 per cent.

There is currently no link between price and usage – no incentive to environmental sustainability.

The likelihood is that future water supply problems will be magnified by climate change. The reason we don't have universal domestic water metering in the UK is down to technology, the cost of meter reading, and unnecessarily complex billing systems.

What do Austria, Czechoslovakia, Finland, France, Germany, Hungary, Japan, Korea, Poland, Portugal, Sweden and Switzerland have in common? The answer – near 100 per cent domestic metering! And in Australia, Belgium and Italy the figure is over 90 per cent.

So the technology is there. Surely, universal domestic metering is the answer".

Meagre?

Maurice Terry of WaterVoice echoed the support for metering in that *"universal metering will vary in speed driven by local circumstances... a defined regional strategy is required"*. He went on to quote the scientist **Lord Kelvin** *"when you can measure what you are speaking about, and express it in numbers you know something about it: but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind"*.

WaterVoice also supports the idea that financial help should be given to those who cannot afford the water bill through use of the social security and tax credit systems.

If metering was extended and innovative tariffs introduced he asked *"how long would it take for the capital and operating costs of implementation to be offset by better resource management and demand management?"*

He did, though, admit there was a deep seated resistance to paying for water as well as concerns over health issues, but he finished with *"let the serious debate start now"*.

Simon Dresner presented the Policy Studies Institute's work on the *Design of Environmentally and Socially Conscious Water Metering Tariffs*

(www.psi.org.uk/docs/rdp/rdp21-dresner-ekins-water.pdf) that used Anglian Water's domestic consumption monitor (SODCON). They had simulated the effect of various tariffs on low income households.

This evidence suggested a metered tariff that varied the price of each litre of water according to Council Tax band we would have a progressive distributional impact and few low-income losers.

An allowance of 'free' water for basic needs could address concerns about households compromising on hygiene for the sake of economy. There should also be special measures for households with medical needs. He said that *"such tariffs could allow environmental and social concerns to be reconciled"*.

The Environment Agency's **Rob Westcott** underlined WaterVoice's and the Policy Studies Institute's call for the Government to lead on devising a fairer charging system.

Metering effect

George Archibald questioned some of the claims of the effect metering has on water demand. He discussed the reliability and quality of Severn Trent's domestic water consumption monitor and put forward the results of the company's estimates, as shown in table 2.

Table 2

Estimate of metering effect

Property type	DCM	Billing system	% difference
	m ³ /year	m ³ /year	
Detached	128	117	-9
Semi-detached	116	96	-17
Other	104	83	-20

Data for 1999/2000 – billing system figures are for non-optant households

He suggested the way to estimate the effect of metering was to determine 'average' consumption in new build metered homes and compare this with results from a (reliable) unmetered consumption monitor. There is also a need to establish a monitor of metered households and to compare 'peak' season consumption with an equivalent unmetered monitor.

To increase the effect of metering on water use requires the use of sophisticated tariffs combined with more customer information. This requires more expensive 'higher technology metering' that could be available at an acceptable cost if supplied in large numbers.

The recent **SMART Trial Data Collection Process** had shown that a sample of twenty properties in Leicester had supplied customers, via the TV, with a range of energy and water information including hourly, daily and weekly water use.

He ended with a plea *"an urgent need for better data"*.

Meters in long term

A further plea for innovative (and flexible) tariffs came from **Eva Greenfield** and **Nicky Simpson** of Ofwat. There were still issues to be solved judging by their conclusions that:

- increased metering means bills to remaining unmeasured customers rise
- future flexible and innovative tariffs
- selective metering is yet to be tested as a demand management tool
- metering is potentially useful in managing demand and makes demand management activity more competitive.

An international perspective came from **Jorg Metzger** of Sensus Metering Systems.

Emerging

It was down to WRc's **Dene Marshallsay** to look at *Metering Technology Perspectives*. He was certain that the emerging technologies can deliver sophisticated tariffs. Dene also predicted a great deal of meter activity with 1.5 million new household meters by 2010 not including the many meters needing replacement.

As with the other speakers he issued a number of challenges to:

- implement metering more cost-effectively
- achieve an impact on demand reduction
- avoid consumer discrimination
- reduce meter billing costs
- maintain good customer relations
- maximise revenue.

Dene's WRc colleague, **Simon Gordon-Walker** added a challenge to Government and the Regulators to *"show leadership and participate in national research and analysis in order to build a political, regulatory and utility consensus before PRO9 deliberations"*.

The presentations can be downloaded from www.sbwwi.co.uk

RWE water loss pilot

American Water, a subsidiary of the Germany based company RWE, (who own Thames Water) have announced what it claims is a first-of-its-kind **Pilot Program in Water Loss Management** that uses automatic meter readings (AMR) to detect and repair leaks. The press release quotes the **2005 Report Card for America's Infrastructure** as saying *"each day, six billion gallons of clean, treated drinking water disappears, mostly due to old, leaky pipes and mains... enough water to serve the population of a state the size of California"*. Permanently installed on pipes near water servicemeters, sensors record sound vibrations over a period of four hours each night and software determines whether a leak is present or not.

Details can be found at www.amwater.com

IWA's International demand management framework

The **International Water Association** has set up a **Specialist Group – Efficient Operation and Management Task Force No. 7 – International Demand Management Framework**. It is expected to complete the project in time for a launch at **Efficient 2007** in the Republic of Korea.

Task Force No.7 is being lead by **Professor Stuart White**, Director of the Institute for Sustainable Futures (ISF), Sydney Australia, and **Francisco Cubillo** of Canal de Isabel II (CYII, the Madrid water company), Spain.

It includes international representation from experts such as **Rob Westcott** (Water Demand Management, Environment Agency, UK), **Mary Ann Dickinson** (California Urban Water Conservation Council, USA) and **Hannes Buckle** (Rand Water, South Africa).

The project, initiated due to a need identified during the IWA's *Efficient2003* and *Efficient2005* water efficiency conferences, will develop an international water demand management framework (with associated step-by-step manual and tools) to provide guidance on best practice water demand forecasting, development of demand management options, assessment of water service provision options and evaluation of implemented demand management programs.

The framework and associated manual will aim to:

- 4 ● develop a consistent international methodology and terminology for demand management/water efficiency in the broader context of water service provision planning and decision making
- provide an effective form of knowledge transfer of the latest research and skills in this field
- enable capacity building; and increase IWA support to its members by being applicable to a broad audience in developing countries, emerging economies and the developed world.

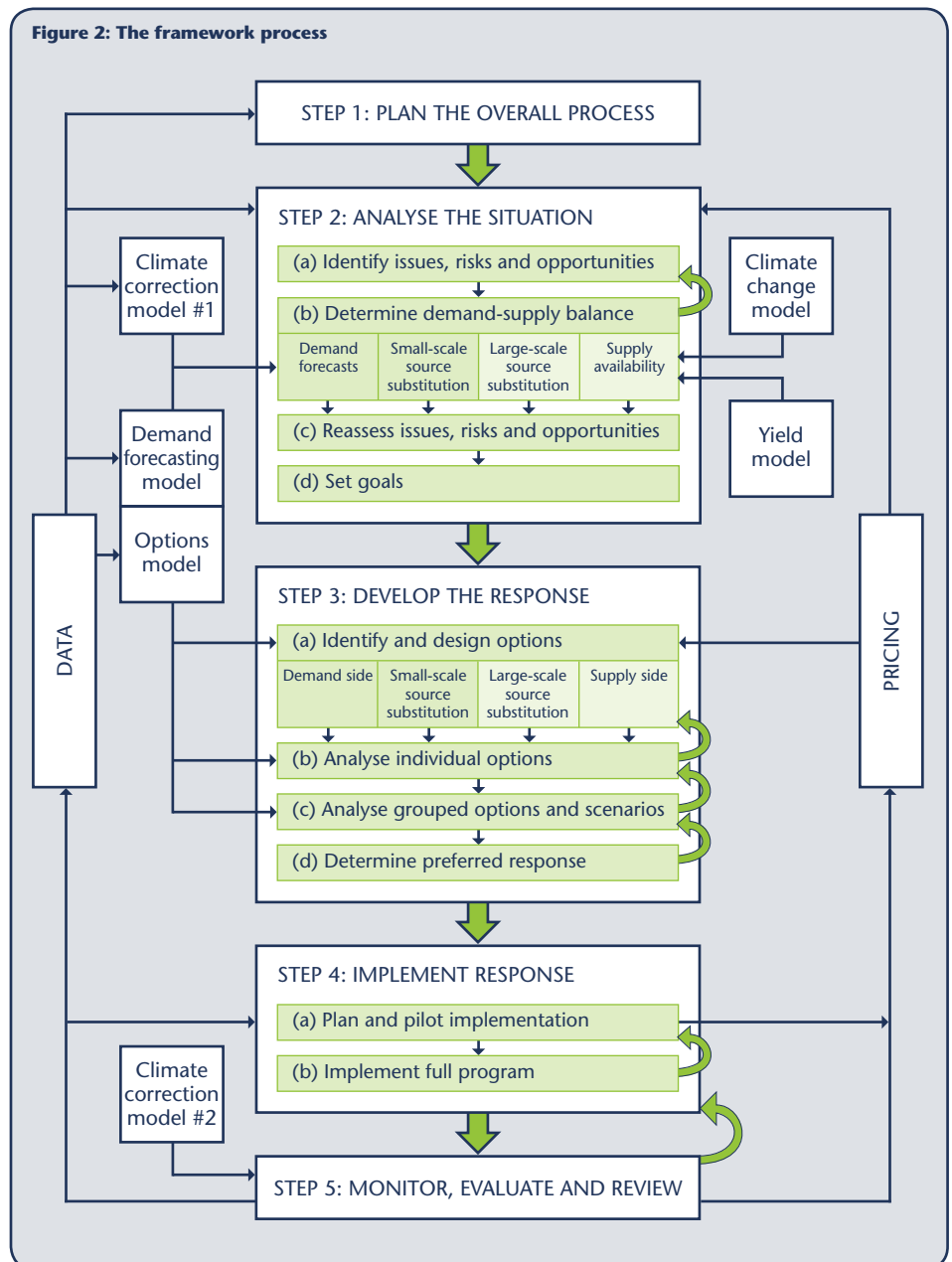
The project aims to follow in the footsteps of the IWA's Task Force No. 4 which has been extremely successful in providing similar support around the subject of system leakage control.

The framework, see figure 2, will put demand forecasting and demand side options analysis alongside yield and supply side analysis in the overall context of how best to provide water services to our urban and peri-urban areas.

It will be developed using a comprehensive assessment of best practice methodologies and application of demand management internationally and use concepts such as end use analysis and integrated resource planning to underpin the framework.

The project will be undertaken in several stages and incorporate a number of case studies to test the application of the framework in different contexts. Stage 1 '*Preliminary literature review and criteria setting*', which is using CYII of Madrid as a case study, has already commenced. Other stages and case studies are currently being negotiated.

If you wish to know more about the project please visit www.isf.edu.au or contact andrea.turner@uts.edu.au at ISF.



Pressure off in South Africa

Ronnie McKenzie from WRP Pty Ltd has sent through details of the *Sebokeng/Evaton Leakage Reduction Public Private Partnership*. It claims to be "the largest single advanced pressure management installation in the world" and was commissioned in only a three month period, a very short period for a country like South Africa.

Carried out in a region with half a million people and with very serious water leakage problems, the project had a three month pay back with the minimum night flow reduced from 3,000 to 2,000 m³ an hour.

Ronnie McKenzie presented the findings at the IWA leakage conference in Canada, www.leakage2005.com

Water leakage in 2004/05

Total leakage levels in England and Wales have been quite static for a number of years, allowing for adjustments in Severn Trent Water's and Thames Water's leakage figures in 2001/02 and 2002/03 respectively.

Table 3 shows Thames Water, United Utilities and Cambridge Water missed this year's targets. In a press release, issued by the Environment Agency, Chief Executive, **Barbara Young**, said "far too much water is wasted in leaks", but added "this year's drought is an important wake-up call, not only for water companies but also for people. Water companies leak a quarter of the water they have – but people waste just as much too. Most people could save a quarter of the water they use by making really simple changes. It's no good just blaming the water companies – we must all take responsibility for our own water use".

Netherlands low leakage levels confirmed

The Netherlands has always reported low leakage levels and an UKWIR project has backed these claims. However, the project found that similar conditions in the UK can lead to similarly low leakage levels.

There was an initial collaboration on leakage control between UKWIR (representing UK water utilities), the Environment Agency and KIWA (representing Netherlands utilities) (see *Bulletin* 48, page 6). The outcome was such that it was decided to carry out a more detailed study, *Comparison of Leakage Levels and Leakage Practice in the UK and the Netherlands*, to confirm and find out the reasons for the low leakage levels in the Netherlands. It also set out to see what each country might learn from each other.

The research, carried out by WRc and Hyder, also involved leakage teams from Bristol Water, Yorkshire Water and Essex & Suffolk Water visiting the Netherlands to study three typical water resource zones. In the event, the evidence supported the reported leakage levels of the order of 13 to 20 litres/connection/day, compared with 75 to 175 litres/connection/day in the UK.

Some of the reasons were quite simple. The Netherlands is very flat and therefore the mains system can operate under very low pressure, especially as high rise buildings have their own pumps so that water can reach the top floors.

The water mains are relatively new, primarily post 1945, and are made of PVC which is non-corrosive compared with cast iron mains. There are few joints as connections to the properties are usually by a single pipe.

Not obvious

One reason was, at first glance, less obvious. The water mains are normally laid in sandy soils in the pavement under paved slabs. The initial

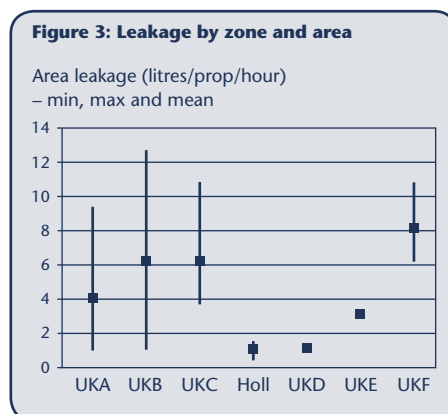
assumption might well be that leaking water would drain away unnoticed. However, in practice, the paving slabs tend to subside over the leaks meaning that bursts are easy to find and to repair.

Water utilities in the Netherlands only need to carry out 'passive' leakage control, in contrast to 'active' leakage control in the UK, as leaks are infrequent and readily reported by the public.

Indeed the Bristol Water team, despite being 'on call' during their visit did not experience a live leak during their week long visit.

Having uncovered the secrets behind the Netherlands low leakage levels the project turned back to the UK to find out whether similar conditions in the UK resulted in similarly low levels. The answer was yes, as illustrated in figure 3.

The report will shortly be available via the UKWIR website www.ukwir.org



Filling in the gaps

Three other recent UKWIR projects have helped to fill in the gaps in leakage knowledge.

The *Natural Rate of Rise of Leakage* (NRR – the underlying rate at which leakage in a system increases over time) is an important parameter in calculating future investment in both asset renewal and replacement as well as leakage control. The project, carried by RPS Water Services, looked at the various ways the NRR is calculated and determined practical methods of determining NRR for a particular area.

As is usual in such studies, care was taken over definitions and their wording. It was decided to separate 'total NRR' (rate of growth in leakage which would occur if both reported and detected leaks were not repaired) and 'detectable NRR' (rate of growth in leakage which would occur if detected leaks were not repaired). Leakage growth rate is a function of burst frequency and the rate at which individual leaks grow over time.

There are two basic approaches to assessing NRR, one based on burst frequency and the other on DMA's nightline. Data was obtained from six water companies covering 50 DMAs together with nightline data spanning three years and the two approaches compared. The nightline method offers the more theoretically consistent approach but raises data quality issues.

The proportion of leakage from the supply pipe has been one of the more difficult parameters to quantify. *Towards Best Practice for the Assessment of Supply Pipe Leakage* has produced a framework methodology which can be widely adopted throughout the UK water industry. The framework sets out clear recommendations on the data that should be collected.

Seasonal variations

Leakage levels rise in periods of severely cold and prolonged dry weather. However there is also evidence of a rise in recent very wet winters. A project, carried out by WRc, aimed to find out the mechanisms behind such seasonal increases in leakage.

Leakage during weather extremes is linked with soil type and conditions. Thus *Managing Seasonal Variations in Leakage* also involved Swansea University who provided expertise on modelling soils.

Data was collected for the cold periods in January 1997 and February 2005, the warm dry summer and autumn of 2003 as well as the prolonged wet weather in autumn and winter in 2000 to 2001.

Taking temperature, rainfall and soil moisture deficit data as well as information on bursts and types of water mains, from six water companies was related to models of soil movements.

Two of the interesting conclusions are that pipes installed in winter have less leakage than those installed in summer and that extreme weather disrupts normal leakage control activity, making it less efficient.

The report will shortly be available via the UKWIR website www.ukwir.org

Table 3 Water company actual leakage and targets

	actual 1998-99 MI/d	actual 1999-00 MI/d	actual 2000/01 MI/d	actual 2001/02 MI/d	actual 2002/03 MI/d	actual 2003/04 MI/d	actual 2004/05 MI/d	target 2004/05 MI/d	target 2009/10 MI/d
Water and sewerage companies				+	+				
Anglian	205	190	195	225	190	216	215	215	210
Dwr Cymru	305	290	260	245	235	231	225	230	195
Northumbrian – north	170	170	165	160	155	160	155	160	150
Northumbrian – south	76	73	72	73	67	70	67	70	66
Severn Trent	345	340	340	340	515	512	500	505	500
South West	92	84	83	84	84	84	83	84	84
Southern	95	93	92	92	92	92	92	92	92
Thames	770	660	690	865	945	946	915	905	725
United Utilities	510	485	465	450	465	479	500	470	465
Wessex	100	88	84	79	75	75	73	74	74
Yorkshire	340	315	305	295	295	295	295	300	295
Water only companies									
Bournemouth & W Hants	26	23	23	22	22	22	22	22	22
Bristol	56	54	55	55	53	53	53	54	54
Cambridge	13.1	12.8	13.3	13.8	13.9	13.6	14.2	14.0	14.0
Dee Valley	11.9	12.5	11.6	11.3	11.5	10.4	10.6	11.5	11.0
Folkestone & Dover	8.7	8.5	8.6	8.4	8.4	8.2	8.4	8.4	8.0
Mid Kent	30	29	29	29	28	30	29	29	27
Portsmouth	30	30	30	30	30	30	30	30	30
South East	98	97	85	75	72	69	69	69	69
South Staffs	77	76	72	71	72	71	74	75	75
Sutton & East Surrey	25	24	24	24	24	24	24	25	25
Tendring Hundred	5.5	5.4	5.5	5.2	5.2	5.1	5.0	5.1	5.1
Three Valleys	155	145	140	155	150	152	150	150	140
Water Industry	3,550	3,305	3,245	3,410	3,605	3,649	3,609	3,598	3,336

+ there were major revisions in Thames Water's figures in 2001/02 and in Severn Trent Water's in 2002/03

Variable flush retrofits save 20.8 litres per property

The Environment Agency has published the results of a collaboration with nine water companies (Anglian Water, Bournemouth & West Hampshire Water, Essex & Suffolk Water, Southern Water, South West Water, Sutton and East Surrey Water, Tendring Hundred Water, Thames Water and Three Valley's Water) of *Retrofitting Variable Flush Mechanisms to Existing Toilets**.

In 1999 Southern Water, Anglian Water and the Environment Agency collaborated on a project (see *Bulletin 28*, page 5) that concluded that retrofitting variable flush devices saved 27 per cent on WC water use – about 8 per cent of domestic demand.

Special dispensation was required to allow retrofitting and the project was instrumental in the Water Regulations being amended to allow WC flush retrofitting.

Following this relaxation, Southern Water then initiated this recent project to obtain more robust data on the benefits of fitting these devices.

The two devices used in the earlier project, the *Variflush* (manufactured by Peterton) and *Ecoflush* (manufactured by Gesek) were selected and found to be relatively easy to fit.

Over 300 properties were recruited to the project. Following rigorous quality protocol, detailed water consumption data from 136 properties was used for the analysis. Customer information was obtained through questionnaires.

Pre-installation consumption was compared with water consumption after installation. The results are very similar to those from the 1999 trial with an average household reduction in consumption of 8.5 per cent. The average reduction and range by property type is shown in figure 4. The full report has similar graphs by company and by device installed.

Customer feedback identified several areas for improvement and the comments have been passed to the manufacturers, giving them the opportunity to improve the devices.

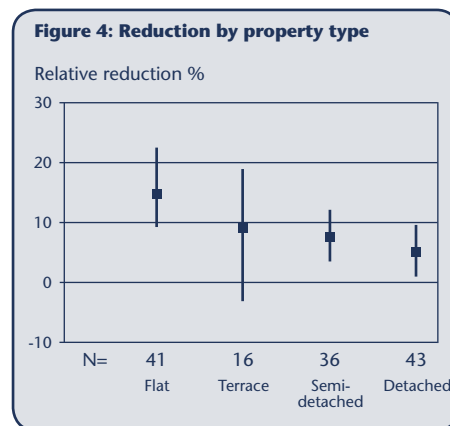
17 month payback

Given the retail price of the device of £20 the average payback time to customer was calculated at 17 months, varying between 10 and 24 months depending on the local price of water.

The success of such devices – and the resulting water savings – depends on how they are promoted, and whether the customer has to buy and fit them.

Most customers were happy to keep the device after the trial, just over half said they would be prepared to pay the full price. With significant water savings offered by the devices, water companies interested in using them in their demand management strategies may have to consider subsidies and free fitting programmes to get customers interested.

* The electronic version of the report can be downloaded from www.environment-agency.gov.uk/savewater. Click on the publications link.



Disaggregated water demand

6 The joint Environment Agency and Dee Valley Water project to investigate the potential disaggregated savings due to water metering (see *Bulletin 58*, page 6) is now finished. After setting up monitoring hardware and collecting data both before and after households switched to a metered supply, the analysis showed that the average consumption decreased by 25 per cent.

Tracewizard software was used on the sample to investigate the breakdown of this change in consumption for each identified type of appliance, which is as follows:

- consumption due to full toilet flushes reduced by 29%
- consumption due to half flushes (where present) reduced by 37%
- consumption due to baths reduced by 30%

- consumption due to showers reduced by 18%
- unclassified consumption reduced by 18%.

Changes per site are shown in table 4 below.

However, the small sample size, low average occupancy rate (1.6 on average) and challenging identification of water uses (66 per cent of the water using events identified, 59 per cent of the volume of water) suggest that further research is necessary in order to validate these results.

Therefore analysis investigating the components of household water use and their evolution are worth developing further, as this type of information is very valuable to regulators as well as water companies.

The electronic version of *Disaggregated Savings due to Water Metering* is available via the Help Desk – see back page for details.

Table 4 Changes in consumption at each site

Site	01	03	04	05	12	14	Average
Pre metering (litres)	794	3599	3364	2113	1410	1202	2080
Post metering (litres)	820	2553	2801	1532	1158	507	1562
%change	3%	-29%	-17%	-27%	-18%	-58%	-25%

UK businesses use three times too much water

Envirowise has calculated that workers typically use 50 litres a day at work which is up to three times more than the 13-24 litres per person that a water-efficient office requires.

Envirowise's Programme Director, Martin Gibson, used this fact to launch *Water Wealth*, an initiative to encourage businesses to cut down their water use.

Earlier, on July 20, Elliot Morley launched the second phase of *The Big Splash* as part of Envirowise commitment to reduce business water use by 30 per cent. He announced that "to date water savings have reached two million cubic metres with associated cost savings of £1.9 million".

Details are at www.envirowise.gov.uk

Affordability pilot study

Defra is leading a group of stakeholders on a pilot study in the South West to test the benefits of actions that together could ease water affordability problems for lower income households. The pilot study will offer targeted assistance to:

- undertake a benefits check to identify areas where entitlements are not being claimed
- check for eligibility under the Water Direct scheme and Vulnerable Groups Tariff
- offer advice on debt management and payment plan advice
- check to see if switching to a metered supply could be cheaper when all the items in the pilot have been worked through
- facilitate access to advice on saving water
- install water-efficient appliances and devices i.e. efficient shower heads, cistern displacement devices and re-washing dripping taps.
- check for water leakage

Details can be found at www.defra.gov.uk/news/041202e.htm

Lots of meters

Research and Markets reports that there are 571 million water meters in the world with a total demand of 45 million new and replacement meters. The demand is expected to rise to 68 million by 2010.

Details at www.researchandmarkets.com/reports/302464

Wales put pressure on water savings

The **Welsh Consumer Council** has looked at the increasing pressures on water supplies in Wales and produced ***Water Pressure: Climate Change, Droughts and Water Resource Management in Wales*** that makes a number of recommendations to the Environment Agency, Ofwat, local authorities and water companies that serve customers in Wales.

The **Welsh Consumer Council** carried out a survey that discovered that more than a quarter of people living in metered households did not practice any water conservation. It also found that more than three in four households had no water saving devices in the home or garden.

They emphasise that water companies have a statutory duty to educate the public about saving water and conclude that the legal duty on water companies to promote water efficiency to households is not delivering savings. They make the following recommendations:

- The Welsh Assembly Government and Environment Agency Wales should develop a water efficiency strategy for Wales that sets out a long-term plan for encouraging more prudent use of water resources;
- The Welsh Assembly Government should update planning guidance to encourage rainwater and waste water harvesting in new developments;
- The Welsh Assembly Government, Environment Agency and Ofwat should give advice to water companies to help them promote water efficiency to households in a way that results in real savings;
- The Welsh Assembly Government should ensure that the Water Supply (Water Fittings) Regulations 1999 are kept under active review to ensure they make the best possible contribution to household water efficiency;
- The Welsh Assembly Government should revise the Welsh Housing Quality Standard to include minimum requirements on the water efficiency of kitchen and bathroom equipment;
- Local authorities should include information on saving water in their newsletters and other communications with the public, and should work with water companies to distribute free or discounted water butts and other types of water-saving equipment;
- The Welsh Assembly Government, Ofwat, and water companies serving Wales should revise water charging systems to make them affordable for low-income households and to bring them in line with environmental, social and economic sustainability principles;
- The UK Government should set up a Water Saving Trust to provide a lead for water efficiency activity;

- Water companies should prioritise leakage reduction and should continue to develop new and better methods of leakage control – consumers will not take water conservation seriously as long as up to 175 litres per property per day is being wasted through leakage;
- Water companies should ensure they are fully prepared for the potential effects of climate change in order to safeguard future water availability, and should use only the most up-to-date micro-component forecasting methods to assess future demand;
- Water companies should ensure that information on how to save water is given to householders who have a water meter installed or who move into a house that already has a meter installed, to make people aware that they can reduce their bills by practising conservation.

The report can be downloaded from www.wales-consumer.org.uk/Research%20and%20policy/reports.htm

£60,000 challenge

Nine organisations have risen to the challenge, laid down by the Deputy Prime Minister, **John Prescott**, to demonstrate that high quality homes can be designed for a construction cost of around £60,000. If successful it could mean a radical change to how homes are constructed in the UK.

7

Home loan incentive

The **Commonwealth Bank in Australia** has introduced the ***Economiser Water Package Rebate*** as part of their commitment to the environment.

If you purchase an eligible water-saving device after you take out a new home loan you can get a rebate of up to \$A600 on the cost of items.

The devices included in the package are:

- washing machines (AAA rated)
- bathroom showerheads (AAA rated)
- dual flush toilets (AAA rated)
- dishwashers (AAA rated)
- rainwater tanks
- drip irrigation systems with a rain or soil moisture sensor.

Chris Davis, Chief Executive of the Australian Water Association commented that *"we think the Commonwealth Bank's scheme to offer customers a rebate on their loan establishment fees is exciting. People need to be offered attractive financial incentives to conserve water. The price of water is generally too low to encourage savings, but a \$A600 rebate on a loan establishment fee will talk to the people's pockets"*.

The offer is available until the end of the year. Details, and the small print, can be found at www.equity.webcentral.com.au

Melbourne goes permanent

Perhaps as a portent of things to come in many parts of the world, Melbourne has now introduced ***Permanent Water Saving Rules***.

Recent rains means that the immediate drought has receded somewhat but the city has decided to introduce five permanent water saving rules as follows:

- manual watering systems are only to be used between 8pm and 10am
- automatic watering systems are only to be used between 10pm and 10am
- hand-held hoses must be fitted with a trigger nozzle (can then be used to wash cars and water gardens and lawns)
- no hosing of paved areas except in specified circumstances
- before filling new pools/spas (with a capacity of 2000 litres or more), an application must be lodged with your government water retailer.

For further qualification of the rules visit the local water company at:

www.melbournewater.com.au,
www.yarravalley.com.au,
www.southeastwater.com.au,
www.citywest.com.au

Social trends in water use

An illustration of how the current pressures on water resources in Australia have entered the collective psyche is the inclusion of a substantial section on household water use and conservation in the Social Trends section of **AusStats** compiled by the Australian Bureau of Statistics.

Tables include water conservation practices in and around dwellings in 2001 and 2004. These show a rise from 43.6 per cent to 46.5 per cent in the proportion of householders taking conservation practices. Ten per cent of households with gardens did not water at all in 2004, a rise from 5.6 per cent in 2001.

The information has been mainly abstracted from the ABS's Environmental Issues; People's Views and Practices, March 2004 (cat. no. 4602.0)

Details at www.abs.gov.au/ and select ausstats.

Women and WDM?

WaDImena has been looking for a qualified researcher for a regional study on gender and water demand management. It does say that *"female applicants from the Arab region are strongly encouraged to apply"*.

Water changes

Changes in UK regulation took place on 1 October. **Ofwat** and **WaterVoice** have been replaced by the **Water Services Regulation Authority** and the **Consumer Council for Water**. The Council, representing customers interests, will be independent from the Authority with separate funding.

Householder's guide

FWR has done everyone involved in water efficiency a service by producing *A Householder's Guide to Water Supply and Sewerage*. It is the latest in their new series of *Guides and Reviews of Current Knowledge on Topical Water-environment Subjects* (ROCKS).

FWR's **Dick Ainsworth** has put together the latest knowledge to explain quite complex issues on which it is not always easy to find reference about the latest situation.

The guide explains, with the help of diagrams, who is responsible for the pipework from the water mains. It also has a section on water efficiency that mentions the Environment Agency's 'fact cards' on water technology as well as linking to the 'savewater' web pages.

It also links to Defra's leaflet *Water Metering – Your New Rights* which is, in itself a useful reference.

Visit www.fwr.org/technol/frg0002.pdf to download the guide.

New books

As the pressure on the world's water resources increases so does the number of papers relating to the subject. **Sandra Postel** is widely respected in this field and her writings are guaranteed to be widely referenced. *Liquid Assets – The Critical Need to Safeguard Freshwater Ecosystems* rejects the water strategies of the last century with "meeting new water needs requires a different approach". This includes watershed protection with effective conservation efforts citing Boston, New York and Bogota as encouraging examples. Visit www.worldwatch.org/pubs/paper/170/

Hit the headlines

Deep-rooted concerns at rednova.com gives publicity to a study by **Professor Ian Calder** at Newcastle University that casts serious doubt that planting trees helps boost water supplies. He is quoted as saying "in upland areas like Kielder in Northumberland evaporation from tree canopies can be ten times greater than that from grassland".

Solar-powered toilets are hot on efficiency in the Cambridge News, Ely edition, tells us that three environmentally friendly toilets have been introduced in Ely. Seventy per cent of the hot water is heated by the solar panels.

Vegas heading for 'dry future' from BBC News is another example of a city (to add to Sydney, Beijing, London ...) that has looked into the future and found that the water sums do not add up.

DIARY

Water UK is holding its annual **Leakage Conference** 12 October 2005 at the Brandon Hall Hotel, Brandon, near Coventry. There is to be a keynote address by **Philip Fletcher**, Director General of Ofwat. Details at www.water.org.uk/info-learn.

The series of workshops on **Sociology of Water Use** continues with workshop 3 on 10 November with 'shaping water practices by infrastructure'. Workshop 4 'water stresses disrupting the consumer' is on 9 February 2006 and workshop 5 'imagining the future' is on 6 April 2006. Details at www.lec.lancs.ac.uk/cswm/dwcworkshops.htm

The School of Water Sciences at Cranfield University is holding a 2-day short course on **Water Recycling for Urban Applications** on 12 and 13 December 2005. Further details available at www.cranfield.ac.uk/sims/water/recycleshortcourse.htm

The American Water Works Association is holding the **2006 Water Sources Conference and Exposition** on 5-8 February 2006 in Albuquerque, New Mexico. Topics include 'innovative ways to finance conservation work', 'conservation as a retail business', 'new, innovative marketing campaigns for water conservation' and 'conservation in the development and redevelopment industry'. Details at www.awwa.org/conferences/sources/

REFLECTIONS

The front page of this *Bulletin* highlights the fact that there has been insufficient progress in achieving water efficiency.

The *House of Lords Select Committee on Science and Technology* seeks to establish what needs to be done to ensure a joined-up approach to water management. There's a danger that the evidence to the committee will focus on technology rather than behaviour. Informing and educating water users to assist them to change current practices is equally important if water savings are to be sustained.

Water companies need to prove the economic case for water efficiency measures to the economic regulator and their shareholders before implementing them more widely. *Waterwise*, whom they sponsor, is a welcome addition as a mechanism for co-ordinating water company research.

The challenge for *Waterwise* will be to extend away from this and promote the social

and environmental benefits of water conservation as well.

Different thinking

America is a place where the proverbial glass is seen as half full. Here the thinking is different. *The Californian Urban Water Conservation Council* proposal for a water efficiency organisation starts with seeking membership from social, political and environmental groups as well as sector representatives.

With a Board made up from these interest groups the focus should be guided by consensual priorities. The inclusive consultation process has already yielded new ideas and filled some gaps. The preparatory workshops suggested other sectors, such as agriculture, should be considered and not solely public water supply.

Importantly, the need to influence consumer behaviour through price signals and education has also been identified.

The arguments presented for such an American organisation could be equally applied to the UK. Our existing piecemeal approach to furthering water conservation measures without central co-ordination has distorted priorities.

Short-term measures are favoured with more enterprising, and potentially beneficial, proposals never moving beyond the research stage. Prolonged campaigns to promote water efficiency, for example, are particularly at risk from the current institutional arrangements in England and Wales that tend to diffuse leadership on the subject.

Our society is in a position where we are able to take our environmental responsibilities seriously. Therefore, shouldn't the case for further water conservation be built on a moral foundation than simply an economic one?

Rob Westcott

HELP DESK

If you require more information on the articles or publications referred to in this *Bulletin*, please contact the HELP DESK via Helen Parrish (Secretary) by email: helen.parrish@environment-agency.gov.uk or by telephone: **01903 832275**. Your comments and suggestions will be most welcome.

Bulletin articles are posted on the Environment Agency's website and are text searchable.

Visit www.environment-agency.gov.uk/savewater for more information.

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