Saving Water

on the right track –

A summary of current water conservation initiatives in the UK-January 1998

ENVIRONMENT AGENCY

Quick Guide

to "Saving Water - On the Right Track"

p5 Promotion of Water Saving Devices

Examines schemes in which water saving devices or water efficient appliances are promoted. Such devices include Hippo Bags, waterless urinals, water efficient domestic appliances and spray guns for garden watering (as opposed to sprinklers).

p9 Water Management in Buildings

Highlights schemes in which organisations responsible for the use and management of a large number of buildings (e.g. local authorities, hospitals, Environment Agency) can significantly reduce water use and associated costs through water audits, changes in use and retrofitting with water saving devices.

p14 Water Recycling and Re-use

Covers schemes in which rainwater rather than mains water is used (and in some cases re-used) directly for a variety of uses. Case studies include a public swimming pool which uses rainwater.

p17 Waste Minimisation Schemes

These schemes, which have proved to be very successful with respect to saving money, energy and natural resources as well as water, relate primarily to large manufacturing or processing industries where significant reductions in water use have been realised through a variety of initiatives.

p22 Leakage Reduction Schemes

Aims to cover the wide range of initiatives currently operating in the water industry which are aimed at reducing water losses from supply systems. Many of these initiatives have commenced recently and few results are available to date. Three case studies for which results are available are described.

p25 Consumption Monitoring Studies

In the absence of widespread, compulsory metering, consumption monitoring studies in the water industry are the primary means through which water companies can gain an understanding of the way in which the water they supply is being used. Four Case Studies are described.

p29 Metering Schemes

Metering schemes are increasingly being acknowledged within the UK Water Industry as a key means of reducing overall water use and increasing understanding of consumption patterns. Many companies are being considerably more proactive than previously in offering incentives to existing customers to have a meter installed. Where necessary, some companies have also introduced a variety of compulsory metering schemes. Three case studies are presented.

p32 Integrated Water Conservation Schemes

Highlights a new and exciting approach to demand management in which specific areas are intensively targeted with a wide range of water saving devices and information. Two different schemes are highlighted, one small-scale and targeted in an area with a specific resource problem and a larger geographically ranging scheme.

p34 Education and Information Programmes

This has been an intensive area of relatively low-cost activity within the water industry for several years. Initiatives include education packs, water-efficient gardens and gardening tips, "DIY" water audits and information services to business. Seven specific initiatives are highlighted.

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Introd

This report has been issued following a review by the Environment Agency of current initiatives in the area of water conservation and demand management in the UK. OFWAT's "1996/97 Report on Leakage and Water Efficiency" published in October 1997, listed a number of water company ideas in relation to the promotion of water efficiency. This report elaborates on some of those ideas by the presentation of greater detail, but also includes many worthwhile water saving initiatives from other organisations not directly connected to the water industry. Many such schemes have been implemented only recently, and many have not yet reached the point at which savings and costs of savings can be evaluated. This review should accordingly be treated as a preliminary one, defining the range of what is being done, with the intention of being extended and updated in due course as more and better data emerge.

A proportion of the current, or completed, schemes have been presented in this review in the form of case studies as a means of illustrating the range of initiatives undertaken in the UK. In general, there are clearly a wide range of new and innovative initiatives underway, and it is in this encouraging context that the document has been entitled "Saving Water - On the Right Track".

The primary purpose of this "Guide" to water conservation initiatives in the UK is to provide both ideas and assistance to Water Companies as they seek to incorporate existing or proposed water saving initiatives into their next Asset Management Plans (AMP3). However, the document is also intended to be of use to local authorities, industry and a range of other organisations, including the water resources planning departments within the Environment Agency itself. The intention is that the document will be expanded and updated in the next few years. To assist in this, the Agency would ask for your continued co-operation in communicating additional information regarding the scope and results of new or ongoing initiatives.

The case studies in the review have been sub-divided under the range of topic headings listed below.

- Promotion of water saving devices
- Water management in buildings
- Water recycling and reuse
- Waste minimisation schemes
- Leakage reduction schemes
- Consumption monitoring studies
- Metering schemes
- Integrated water conservation schemes
- Education and information programmes

u c t i o n

For many years, the perception that demand management and water conservation were essentially synonymous with metering and leakage reduction programmes has been widespread in the UK. The topic headings presented clearly illustrate that this is no longer consistent with reality and that a wide range of new and potentially effective initiatives are now being considered or actively employed. These range from education and information programmes through to the incorporation of water-efficient appliances in new house building schemes and the retrofitting of schools and office buildings with water saving devices.

In reading the review, the following should be taken into account:

- Wherever possible, the review provides details relating to the costs of each scheme and the water savings achieved. Where this information is unavailable at this time, or impossible to collect, other indices have been used to provide an indication of the effectiveness of a particular initiative. In all cases a contact name and address has been provided as a source of further information.

- The Environment Agency supports all initiatives aimed at reducing water use and are grateful to all organisations which have responded positively to its request for information. A full list of acknowledgements is provided at the back of this Guide. In selecting a range of initiatives, there are obviously some which have been submitted to the Agency but have not been included. The Agency would wish to make clear that this is in no way a reflection of the quality or value of the schemes which have been omitted.

- The case studies included in the review have been compiled on the basis of the response to a request for information issued by the Environment Agency to the Water Companies and several other organisations in July 1997 (a full list of all the organisations contacted is provided at the end of the Guide). Although all organisations have been contacted on several occasions to ensure the maximum possible response to the Agency's request, it is acknowledged that this document does not exhaust the range of current water saving initiatives being employed in the UK. As indicated previously, the Agency would still welcome details of other schemes both for information and for inclusion in future versions of this document.

section 1

Promotion of Water Saving Devices

This section examines schemes in which water saving devices or water efficient appliances are promoted. These schemes appear at present to be relatively limited in number, with the exception of the promotion of Hippo Bags. The schemes differ from general education and information programmes in that they involve the very specific promotion of devices or techniques. The case studies presented include a promotional trial undertaken by Severn Trent Water, a sprinkler amnesty introduced by Southern Water, in which sprinklers were exchanged for spray guns, and a Hippo Bag promotion instigated by Wessex Water.

As with the more general educational schemes, it is difficult to measure the impact of these schemes in terms of water saved, but wherever possible some assessment has been provided.

Case Study Summary: The Raynesway and Mansfield Projects

Organisation: Severn Trent Water (with Armitage Shanks and Caradon Mira)

Contact: Jo Dempster
Severn Trent Water Limited, 2297 Coventry Road, Birmingham B26 3PU
Tel: 0121 7224505

Initiative Summary: As part of internal trials, water efficient equipment has been fitted into the staff toilets of Severn Trent's Raynesway and Mansfield sites. The washrooms are used by manual and office staff and include shower blocks. Significant savings are being made with the newly installed infra-red urinals and one spout electronic taps, whereas lesser savings are being gained from push taps and on new toilet flushes (7.5 litre cisterns, rather than 9.5 litre cisterns).

Comments: The water efficient equipment was fitted at the beginning of January 1997 and the results so far indicate a 60% reduction of water usage. The equipment used in the Raynesway scheme, which costs in the region of £2000, was provided free by Armitage Shanks. Further costs to be taken into consideration would be the installation and materials charges which were covered directly in this instance by Severn Trent.

Some of the results from the Mansfield scheme are shown below. The taps were changed to one-spout auto taps with a thermostat underneath for the hot taps.

Gents Urinals

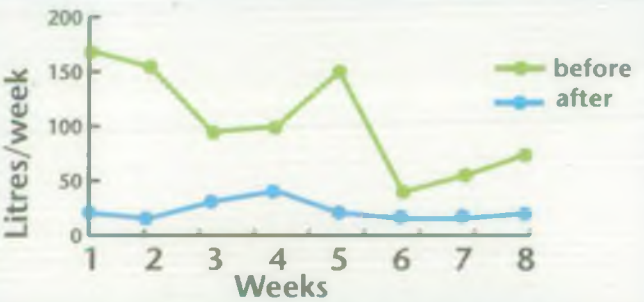
mean decrease in water use = 93%

Ladies Toilets

mean decrease in water use = 28%

Gents Cold Taps

mean decrease in water use = 78%



Ladies Hot Taps

mean decrease in water use = 54%

Severn Trent Water

Case Study Summary: Sprinkler Amnesty

Organisation: Southern Water

Contact: Jon Crooke
Southern House, Lewes Road, Falmer, Brighton BN1 9PY
Tel: 01273 663660

Initiative Summary: Adverts in the national and local press promoted this campaign for all customers to return their old sprinklers to certain electricity shops, in return for a brand new 'Hozelock' spray gun. Promotional literature highlights the fact that a conventional sprinkler uses as much water in one hour as a family of four does in two days. In comparison, the Hozelock spray gun fits directly on to most hoses and the directional nozzle allows water to be targeted where it is most needed.

Comments: The demand for the new sprinkler guns was so great that the initial 10,000 guns ordered were not sufficient. By the end of the campaign around 12,000 spray guns had been exchanged for old sprinklers. This scheme was undoubtedly very successful, although the savings are unquantifiable.

Case Study Summary: Dry Compost Toilets Pilot/Waterless Urinals

Organisation: National Trust

Contact: Rob Jarman
33 Sheep Street, Cirencester GL7 1RQ
Tel: 01285 651818

Initiative Summary: The aim is to assess the viability and user acceptability of dry compost toilet systems and waterless urinals, and also the long and short term maintenance costs in relation to the benefits they give. Dry compost toilets have been installed in Gloucester & Purbeck, whereas waterless urinals are being piloted in four National Trust sites: Corfe Castle, Berrington Hall, Knightshayes Court and Hughenden Manor. The target groups for these innovations are primarily measured public WCs and office premises in locations where water use needs to be minimised or mains supply and sewerage is not available.

Comments: The 3 Clivus ultra low flush composting toilets installed at Middlebere Farm, Purbeck cost £4182 and £3692 to install as opposed to £2000 for a cess pit with monthly emptying of £70. Although the installation costs here were particularly high the low running costs and very low water consumption were considered more important.

At Spyway Farm, Purbeck a waterless compost toilet was installed where there was not an existing facility, the cost of this was £4500 which included an underground chamber, maintenance is approximately £200 to £300 per unit per year.

The waterless urinals were all retrofitted into existing bowls, each cost the Trust £20 for a one-off licence fee and £25 for installation, a six month supply of pads cost £35.38 per urinal. Where measured, the cost of the pads exceeded the cost of the water saved. The predicted savings in both water and money is only 10-12% due to high running costs, however in a new fit situation the savings on traditional plumbing would strengthen the financial case.

Case Study Summary: Hippo, the Water Saver

Organisation: Wessex Water

Contact:

Paul Adshead
Alton Lodge, Alton Street, Ross on Wye, Herefordshire HR9 5AG
Tel: 01989 766667

Initiative Summary: Wessex Water approached Purbeck Upper School, Dorset and a number of households to undertake a live trial of the hippo: a simple water saving device installed in the cistern of toilets. The purpose of the live trial was not only to test the water saving properties of the device, but also to assess the reduction in flush effectiveness and customer acceptance. Follow-up calls were made to the householders to see if the device had been fitted and to listen to their comments on the Hippo fitting instructions.

Comments: 152 households were approached, of these only 19% used the hippo, but 14% were still using them after 9 months. The instructions were said to be clear, and many said that they had simply "fitted and forgotten".

In the flush trials, there was an average saving of 2.78 litres per flush. Over a 7 day period there were 2714 flushes and 288 secondary flushes. A debate has arisen over secondary flushes, but there is not sufficient evidence to say whether these would still have been necessary without the hippo being fitted.

section 2

Water Management in Buildings

This section includes five case studies, three involving local authorities, one a county hospital, and one from the Environment Agency. In all cases, it is apparent that relatively low cost initiatives have produced quick returns and significant long term savings. Starting with a water audit, possibly involving the installation of additional meters for monitoring purposes, most schemes entail the installation of water saving devices in toilets and washrooms. It appears that this is an area in which there remains considerable scope for savings in non-household water use.

Case Study Summary: Brancaster Coastal Studies Base

Organisation: National Trust

Contact: Rob Jarman
33 Sheep St., Cirencester GL7 1RQ
Tel: 01285 651818

Initiative Summary: The objective is to design and construct a residential Coastal Study Centre for 40 students, both school children and adults. The building is Grade II listed, and built to demonstrate environmentally friendly building services. The following water and energy efficient appliances have been included in the design of the centre:

- all toilets are to be calibrated for minimum volume of water use whilst keeping drains clear
- all showers will be low flow, self closing (i.e. push-button)
- water will be distributed at 45^{0}C to avoid heat loss and use of cold water for cooling
- auto-off type taps (i.e. press taps)
- water efficient laundry and kitchen appliances
- rainwater storage for yard use
- solar water heating panels on the roof
- a heat collector will be buried in the adjacent ground, upgraded by a heat pump to provide space heating and hot water
- a weather centre for use by the pupils will also provide climatic data to be compared with the energy/water consumption monitoring

Comments: The centre is due to be opened in Spring 1999, the anticipated cost of the whole project is £850,000. The costs of the water saving devices are not available, however, the use of both water and energy will be closely monitored.

Studies pursued by the pupils will include using software programs and data relating to the resource use of the building (energy and water consumption etc.) and relating it to coastal environmental issues.

Case Study Summary: Retrofitting with Optiflush urinals

Organisation: Lincoln and Louth NHS Trust

Contact: Kevin Thoy, Mark Graham
Lincoln and Louth NHS Trust, County Hospital, Greetwell Road, Lincoln LN2 5QY
Tel: 01522 512512

Initiative Summary: The county hospital was concerned about their use of water, especially overnight when buildings are unoccupied. They installed a trial Pegler Optiflush unit in one urinal and monitored the reduction in water use over a 4-5 week period. The trial was considered a success as 3.4m^3 of water was being saved on average a week, totalling £228 per year on water and sewerage with this one installation.

Following these results they purchased a total of 14 units and implemented a general policy of good housekeeping for water conservation. Although the frequency of washes had to be slightly increased to prevent the occurrence of odour, it is considered that the pay back period for the Optiflush units was approximately one year. Monitoring of the water supply continues but not on a local enough scale to measure the specific savings from these installations.

Case Study Summary: Water Management in Buildings

Organisation: Kirklees Metroplitan Council

Contact: Mr. J. Milnes
Kirkgate Buildings, Byram Street, Huddersfield HD1 1BY
Tel: 01484 226114

Initiative Summary: In 1989 Kirklees Metropolitan Council started a programme of reducing water use and implementing water metering to save water supply and sewerage charges in its buildings.

All the council's buildings were previously charged for their water supply and sewerage on the rateable value of their buildings. Water meters were introduced and usage carefully monitored. Over-charged accounts were identified and rebates requested from Yorkshire Water Services. Additional to this, the following water saving devices had been fitted by March 1994:

- 4,066 tank dams fitted to toilets,
- 12,081 tap restrictors to taps,
- 488 push tap conversions, and
- 433 electronic flush controls to urinals.

This has reduced water consumption by a total of 127,500 m^3/year.

Comments: The introduction of water metering has been very successful, in the first year of the project 53 sites were fitted with meters, costing £20,600, but saving nearly £100,000 per year. 120 meters had been fitted by March 1993. The cost of the scheme between 1989 and March 1994 totalled less than £236,000, resulting in savings per year of over £343,000. Staff costs amounted to less than £52,000 over this period.

Case Study Summary: Water Audit/Retrofit

Organisation: Royal Borough Of Kingston

Contact: Trevor Adams
Royal Borough of Kingston-upon-Thames, Guildhall II, Kingston Upon Thames,
Surrey KT1 1EU
Tel: 0181 2965930

Initiative Summary: In 1991 Kingston Borough Council's Energy Management Unit financed the installation of water saving devices in many of the councils buildings which have metered supplies of water. These devices included:

- tap restrictors
- tank dams
- urinal controls

Comments: The resultant saving of on average 49Ml of water per year is an average reduction of over 41%, amounting to £38,200 per year.

The graph right shows the reduction in water consumption at Robin Hood Primary School as a result of the installation of water controls.

Water Consumption at Robin Hood Primary School Before and After the Installation of Water Controls

Case Study Summary: Schools in Oxfordshire

Organisation: Oxfordshire County Council

Contact: Bob Warner
Environmental Services, Oxfordshire County Council, County Hall, New Road,
Oxford OX2 1SD
Tel: 01865 792422

Initiative Summary: Oxfordshire County Council already had a policy of water metering and efficiency measures. Schools were targeted for water usage reduction action due to their high concentration of urinals. The council went to tender to find the most suitable urinal controls, ones where the timing could be co-ordinated with lessons, whilst maintaining a 20min flush time during periods of use. Urinal controls from Flow Control were chosen on the grounds of their reliability. These were then fitted in 350 schools, along with tap restrictors and toilet dams.

Impacts Summary: The authority's annual water bill was reduced by £262,000, for an investment of over £200,000. The payback period for this scheme is less than one year, incurring "profit" from then on.

Case Study Summary: Water Efficiency in Environment Agency Buildings

The following two case studies are seperate initiatives but both arose out of a need for the Environment Agency to reduce water consumption in its own buildings.

Organisation: Environment Agency North West Region

Contact: Debbie Jordan
Richard Fairclough House, Knutsford Road, Warrington WA4 1HG
Tel: 01925 653999

Initiative Summary: Richard Fairclough House is the Head Office for the Environment Agency's North West Region. Here a water audit survey was undertaken in time for recommendations to be incorporated into the planned refurbishment of the toilets and showers. Results from the metering of water use showed that water being used per staff member was a third higher than the average for offices and factories.

Overnight tests showed that 300 litres an hour were being used. When the urinal flushes were turned off, only 10 litres per night were being used.

Impacts Summary: A series of water efficient measures were taken, these included:

- regular monitoring of water use
- installing water efficient toilets, urinals, showers, and taps
- stocking gardens with plants that require little water.

These measures have halved the amount of water used at Richard Fairclough House, well over the Agency target of reducing water consumption by 30% from 1992 levels.

Organisation: Environment Agency Southern Region

Contact: David Howarth
Guildbourne House, Chatsworth Road, Worthing BN11 1LD
Tel: 01903 832000

Initiative Summary: Guildbourne House is the Head Office for the Environment Agency's Southern Region. Investigation showed that annual consumption in 1996 was 3,000m^3, which equated to 15m^3/employee/yr compared to the current national target of 7.7m^3/employee/yr.

Impacts Summary:

At Guildbourne House, water consumption in 1997 was 900m^3, (4.5m^3/employee/yr) a saving of over 2,000m^3 (70%) equating to a reduction in water charge of £2900. 75% of this is attributable to the installation of waterless urinals with the remainder due to the Hippos installed in the existing toilets and general employee awareness. The waterless urinals not only save on water charges but also on dowsing systems and chemicals to remove scale which are no longer required. Taking these into account, first year savings due to the waterless urinals alone are estimated to be of the order of £2250 and second and subsequent year savings £2800.

Water Recycling and Reuse

Although a subject of increasing interest in the UK, specific examples of water recycling and re-use schemes, as opposed to the available technologies in this field, appear to be very limited at present. Three relatively small schemes are presented below, each of which are highly innovative in different ways and all are proving to be very successful.

section 3

Case Study Summary: Rain Water Harvesting

The following two case studies are separate initiatives but both sprang out of a necessity to prevent discharges to surface water rather than reduce water use. However, the innovative use of recycling has reduced water usage and prevented any additional effluent discharges. The schemes are summarised in turn below.

Organisation: Truro College

Contact: Peter Ward
Truro College, College Road, Truro, Cornwall TR1 3XX
Tel: 01872 264251

Initiative Summary: Carrick District Council was concerned about additional surface water discharge into Callenick Creek which has a history of flooding. In order for necessary building work to proceed at Truro College a system of rainfall harvesting was implemented.

A rainwater collection system leads to an underground reservoir made from galvanised tanks, these were buried on the college site underneath the car-park. This collects rainwater running off from the teaching block, art barn, sports hall and refectory.

Comments: As well as allowing building work be undertaken, the collected rainwater is treated and re-used for toilet flushing, entering the sewerage system in the usual way. This alternative supply of water reduced the colleges water supply costs.

Organisation: Carrick District Council

Contact: Joe Robertson
Carrick House, Pydar Street, Truro, Cornwall TR1 1EB
Tel: 01872 224329

Initiative Summary: Carrick District Council were unable to build their proposed leisure centre due to the increased burden on storm water drains. Along the same principles as Truro College, the council developed a rainwater run-off collection tank which the Environment Agency stipulated for flood defence purposes must have an equivalent volume to that of a "one in two hundred year" flood.

The collected water is treated and used in the swimming pool and leisure centre system. Swimming pools are prime water users and so rainwater harvesting prevented what would otherwise have been a significant source of mains water use.

Case Study Summary: Hilliers Nursery Irrigation Scheme

Organisation: Hilliers Nursery

Contact: Alan Smith Environment Agency
Sarum Court, Sarum Road, Winchester, Hants S022 5DP
Tel: 01962 713267

Initiative Summary: This scheme involves the systematic re-use of rain water and locally abstracted water for irrigation. The nursery is built upon a slope - all of the plants are in pots, placed upon plastic sheeting. Thus all excess rain and irrigation water flows down the slope to a reservoir and is then re-used for irrigation purposes.

Comments: The increasing cost of mains water led Hilliers to investigate the potential for recycling. A recycling system with treatment to prevent plant disease has allowed the use of locally abstracted water, rain water and recycled water to irrigate pot plants. This has enabled the use of mains water to be reduced by approximately 95,000m^3 per annum giving approximate savings of £53,000. The reservoir cost about £120,000 to install. The cost of installation had been covered and exceeded within 3 years, and the nursery are contemplating building a second reservoir.

section 4

Waste Minimisation Schemes

The instigation of large scale waste minimisation schemes in the UK since the late 1980's has realised significant reductions in energy use, consumption of raw materials (including water) and pollutant loadings in effluent discharges. Considerable financial savings have also been realised. There are many successful examples, including the Aire & Calder and Project Catalyst waste minimisation schemes. The latter has been published as part of the Environmental Technology Best Practice Programme (ETBPP), a joint Department of Trade and Industry and Department of the Environment initiative. Several of the case studies arising from Project Catalyst are summarised in this section, together with an independent scheme operated by Aylesford Newsprint Limited.

The ETBPP have issued a number of water related publications in recent years. The principal publications are "Saving Money Through Waste Minimisation: Reducing Water Use" and "Cost-Effective Water Saving Devices and Practices". For further information on these publications and the ETBPP, contact their Environmental Helpline on 0800 585794.

It should be noted that with many waste minimisation schemes, it is possible to quote reasonably precise figures for the reduction in water use per tonne of production. However, if such reductions lead to significant increases in total production in the long term, the Agency recognise that the impact on water resources as a whole may be less than initially envisaged.

Case Study Summary: Humber Forum Waste Minimisation Project

Organisation: Humber Resource Efficiency Centre

Contact: Terry Lander
Commerce House, 62 Paragon Street, Hull. HU1 3PW
Tel: 01482 228580

Initiative Summary: The Humber Forum waste minimisation project, one of a series of UK waste minimisation clubs monitored by the Environmental Technology Best Practice Programme, involved 11 companies from the Humber region with a commitment to waste minimisation. Training was given to enable the participating companies to identify opportunities to reduce waste and implement waste minimisation programmes. The recognition that waste is purchased material which is not sold as a product provided a major stimulus to waste reduction.

Impacts Summary: Some of the many benefits of this project are:

- Total cost savings of over £1 million/yr with an overall payback of less than 6 months
- Identification of a further £1.4 million of savings that can be made in the future.
- In environmental terms, this equates to achieved annual savings of 17,000 m^3 of water and over 43,000 m^3 of liquid effluent
- Participants found that joining the 'club' provided the focus, impetus and discipline needed to implement a waste minimisation programme. Meetings at which participants reported back to the group on what they had achieved proved particularly useful
- Over a five-year period, the Humber Resource Efficiency Centre aims to help at least 145 companies in the region implement a waste minimisation programme

One individual company's success has been detailed below:

Hodgson Chemicals Ltd manufactures performance chemicals for the leather, construction and textile industries. Hodgson's methodology involved teams from various departments identifying waste producing processes. Of particular interest to this company were product and process development, trade effluent generation and energy consumption. As part of the project, a major water saving initiative was undertaken:

- A liquid waste stream, which was previously discharged as trade effluent or tankered off-site, is now being recycled. Savings of £200,000/year in increased yield and reduced disposal costs have been achieved for an investment of £20,000 on pipework and tanks.
- Targets for future improvement include minimising leaks, improving pump and pipeline maintenance, reducing wash-out between batches and recycling water where possible. A combination of reduced volumes and lower chemical oxygen demand content has already reduced trade effluent costs by about £20,000/year.

HUMBER
RESOURCE EFFICIENCY
CENTRE

Case Study Summary: Environmental Technology Best Practice Programme (ETBPP) - Examples from Project Catalyst

Organisation: Various (Project co-ordinated by WS Atkins)

Contact:

David Jones
WS Atkins House, Birchwood Boulevard, Birchwood, Warrington, Cheshire WA3 7WA
Tel: 01925 - 828987

Initiative Summary: This good practice guide for waste minimisation was produced by the Environmental Technology Best Practice Programme. It outlines a systematic approach to reducing the costs associated with water use and waste disposal. The procedure, which can be incorporated within existing management systems, stresses the importance of:

- involving all members of staff from senior management to plant operators
- developing a clear, easily understood plan
- determining the true costs of water consumption and wastewater generation
- identifying all water inputs and outputs
- drawing up a water mass balance
- allocating annual water consumption between major users
- brainstorming to generate water saving ideas
- implementing all feasible options
- maintaining savings

The Guide also explains that reducing water consumption is both compatible and consistent with reducing contaminant concentrations. The approach needed to minimise water consumption successfully is also applicable to reducing contaminant levels in wastewater and may produce additional cost benefits.

The potential cost savings and other benefits of reducing water consumption are highlighted in a series of industry examples. All these successful water saving schemes are selected from projects undertaken by participants in the regional waste minimisation club, ***Project Catalyst.***

Two case studies are outlined below to show the range of companies involved and the diversity of measures implemented.

Chloride Motive Power (CMP) Batteries Ltd use water for processing and handling of lead and lead oxide, cooling, emission abatement and dust suppression equipment. Invoices, meters and sub meters were used to compile a water mass balance identifying the main areas of water use. Various water saving measures were introduced, some were low cost housekeeping methods, others included:

- replacement of a wet filtration system with a membrane filter. The new filter saves around £12,000 a year in mains water and effluent (16,000 m3/yr), as well as reducing lead emissions
- a cross-flow filtration system to recover lead oxide fines from process water enabling reuse, this saves approximately £9,000/year in water and £11,000/year in lead oxide
- recycling water in the drying oven section saves £30,000/year
- recycling cooling water for the paste mixer saves £9,000/year
- recycling water in the jar formation area saves £50,000/year
- further measures are being investigated with hope of additional costs savings of £70,000/year.

The payback period for most projects was 1-2 years.

Borden Decorative Products Ltd are wallpaper manufacturers. As part of Project Catalyst they first installed meters to identify the areas of water usage and to create a mass balance of water use throughout their site in Devon. Several areas were identified where water was being wasted, these included:

- cooling water being fed into a group of print rollers which did not require cooling; this was turned off
- where water was being supplied at a rate greater than required; flow restrictors were fitted.

These measures have reduced their water use from 500,000m^3/year in 1992 to 305,500 m^3/year in 1995, amounting to £143,500 saving per year at virtually no cost.

Further measures planned include replacing the solvent recovery plant for the vinyl base used in the manufacturing process, this will free the cooling tower used for the current solvent recovery system. The redundant cooling tower will then be used to convert the cooling systems for the various wall paper lines into an open loop system. This should save 115,000m^3 of mains water/year with a payback period of around seven months.

Case Study Summary: Aylesford Newsprint Waste Minimisation

Organisation: Aylesford Newsprint Limited

Contact: Sophie Mason
Aylesford Newsprint Ltd, Newsprint House, Bellingham Way, Aylesford, Kent ME20 7DL
Tel: 01622 796218

Initiative Summary: Aylesford Newsprint produces recycled newsprint from used paper, achieving a result of 422,000 tonnes of used paper to produce 332,000 of recycled paper in 1996. The company's commitment to environmental improvement is highlighted in their 1996 Environmental Report. The key to Aylesford Newsprint's effective resource minimisation scheme is its attention to water re-use and recycling. This was prompted by the Environment Agency's condition that Aylesford Newsprint's opening of their new paper machine would not require an increase in the water being taken from the River Medway.

Although paper recycling requires large amounts of water, Aylesford are dedicated to minimising the amount of water used, so reducing costs and waste produced. They say 'We must plan for times when groundwater resources may become less available'. During 1996 an active management programme aimed at the reduction of specific water consumption, involving all areas of the mill was introduced. By progressing a small number of modifications to the water systems, increasing awareness, recording water usage and targeting high users of process water, in combination with a gradual increase in production, a reduction in water consumption has been achieved.

Comments: In the 1995 Environmental Report, the company made a commitment to reduce water use to $12m^3$/tonne in the paper making machines. For all mill operations in 1996 they achieved an average water consumption of $16m^3$ /tonne of production. For their newest machine they achieved the target of $12m^3$/tonne of production.

Leakage Reduction Schemes

Surprisingly, very little information on current leakage reduction initiatives has been submitted by the water companies for use in this guide, although a wide range of schemes are currently in operation in the Industry. These schemes include customer hotlines, such as North West Water's "Leakline", which is summarised. Two other case studies are presented, both of which are successful pressure management schemes.

It is anticipated that in the future updates of this review there will be a considerably wider range of leakage reduction schemes with increasingly detailed information relating to water savings and the costs of achieving those savings.

section 5

Case Study Summary: Iron Acton Leakage Reduction Scheme

Organisation: Bristol Water Plc

Contact: Stan Bessey
PO Box 218, Bridgewater Road, Bristol BS99 7AU
Tel: 0117 9536411

Initiative Summary: The objective of this scheme centred in Iron Acton, near Bristol, was to reduce leakage through pressure reduction. The project was aimed at all types of Bristol Water's customers in addition to their own company infrastructure. Aztec engineering, in conjunction with Bristol Water, have developed a new pressure reducing valve which was employed on this scheme.

Impacts Summary: Assessed results of the installation of this new valve at Iron Acton show that actual savings were even greater than original estimates, at 10-40 % of distribution input. The cost of the installation of the valve came to around £2,926, but water consumption has been reduced by 63 ML/annum. The annual saving to Bristol Water based on operating costs alone is around £2,145 and thus the payback period is only 1.4 years. Twenty further units have since been installed in the company's area, with payback periods ranging from 0.5 to 8 years. When taking into account current estimates of long run marginal values of water and the environment, pay back periods will be considerably shorter.

Case Study Summary: Leakline

Organisation: North West Water

Contact: Dave Fielding
Lingley Green Avenue, Great Sankey, Warrington WA5 3LP
Tel: 01925 463679

Initiative Summary: 'Leakline' is a free telephone service which customers of North West Water can use to report leaks in their gardens, the road or their footpaths. The scheme was launched in April 1996 as part of a campaign to increase customer awareness of leak prevention and repair programmes. As part of the initiative, free repairs were offered on all external leaks on a customer's property. A media campaign was launched to promote the service, including a full press launch as well as smaller adverts on buses and later in the press.

Impacts Summary: Since its launch in 1996, Leakline has received 49,000 calls (approximately 3,000 calls per month). The domestic free leak repair service carries out an average of 1260 repairs per month, with a total of more than 21,000 free repairs being carried out since the Leakline launch. It is estimated that the 15,300 free repairs in the first year required an investment of approximately £2.5 million.

Since 1995, the whole leakage strategy has saved around 250 million litres of water per day and is on target to have reduced leakage by almost 400 million litres per day by the year 2000.

Case Study Summary: Pressure Management on the Harefield Supply Zone

Organisation: Three Valleys Water

Contact:

Frederic Devos
Three Valleys Water, PO Box 48, Bishops Rise, Hatfield, Hertfordshire AL10 9HL
Tel: 01707 277170

Initiative Summary: Pressure management enables a variable pressure to be set throughout the day, using a pressure reduction valve (PRV) to provide a uniform pressure at the target point. The aim of the scheme is to reduce excessive off peak pressures and thereby reduce the water lost through leakage, and also the number of pressure related mains bursts. During early 1997, 9 PRV's were installed on the trunk mains of the open Harefield supply system, supplying the districts of Uxbridge, Hayes, Greenford and Hillingdon. The outlet pressure on the PRV was adjusted, sending precisely controlled electrical pulses to miniature solenoid valves contained in the solenoid box. Solenoids allow small amounts of water to be transferred into the system, altering the pressure in the pilot chamber of the pilot valve. This in turn controls the pressure of the main PRV.

Impacts Summary: The Harefield pressure supply scheme has potential savings of up to 8 ML/day. This scheme has been targeted at over 200,000 properties in the North London area, so far costing around £150,000. Early results suggest savings of at least 7 ML/day. The scheme has been initiated at Hillingdon hospital, where Three Valleys is obliged to pump water to the ninth storey as there are no water storage facilities available. Night time pressure at the hospital had risen to 75 metres head, but this level has now been reduced to 37 metres head: a bare minimum to reach the ninth storey.

Three Valleys are currently in discussion with the Hillingdon hospital estates management, to put in a low level storage system so that further benefits from the pressure management system can be realised, whilst affording the hospital an increased security of supply to their tower block. These discussions include the possible installation of a booster pump specifically for the hospital.

section 6

Consumption Monitoring Schemes

Consumption monitoring studies are a key area of activity if water savings schemes are to be effectively targeted. The most significant study of this kind undertaken in the UK to date is the Study of Domestic Consumption (SODCON) undertaken by Anglian Water, and this is summarised below. The Agency are aware that a wide range of other schemes are now underway. Two of these, which were submitted to the Agency as part of this review, are being undertaken by Portsmouth Water and Bournemouth and West Hampshire Water, and these are also summarised.

Although not a UK initiative, a case study using a water use disaggregation software package called Trace Wizard has been included. The package, which was developed in the USA, has significant potential for assessing the true impact of water saving initiatives and for this reason the Agency are keen to promote its use, and that of similar assessment tools.

Case Study Summary: Un-measured Household Consumption Survey

Organisation: Portsmouth Water Plc.

Contact: Mike Hedges
PO Box 8, West Street, Havant, Hampshire PO9 1LG
Tel: 01705 499888

Initiative Summary: The primary objective of this scheme was to determine the per capita consumption of un-measured households. In order to achieve this a questionnaire was sent out to the 500 unmetered households monitored. These customers were offered a £5 rebate from their 1997/8 water bill in return for a completed questionnaire. The results of these surveys will provide data such as occupancy, type of residence and household appliances in use.

The households were selected in representative proportions of the whole company area by house type (detached, semi-detached, terraced, etc.), the overall mix being provided by CACI Ltd.

The 500 households monitored will all be fitted with a meter on each stop cock combination box. Consumption will be measured over the long term and then collated with the results of the questionnaire to provide a complete per capita consumption pattern.

Comments: The scheme is currently being set up and initial results will not be available until 1998.

Case Study Summary: Domestic Consumption Monitoring

Organisation: Bournemouth and West Hampshire Water Plc

Contact: Roger Harrington
George Jessel House, Francis Ave., Bournemouth, Dorset BH11 8NB
Tel: 01202 591111

Initiative Summary: This scheme involves a company-wide survey, the objective of which was to obtain better information about the components and total water usage in un-measured households. The survey was carried out over a sample of 1000 households, comprising twenty metered zones, each containing an average of fifty households. Houses within these zones were classified according to the ACORN (A Classification of Residential Neighbourhoods) method of classification in order to achieve a representative sample selection. These 1000 properties were subject to a face to face household survey, after which they were asked to fill out a diary showing their weekly water usage. The households surveyed were also metered over a period of one year. All of this information was collated and used to calculate an average per capita consumption rate.

Comments: The survey has significantly enhanced the Company's knowledge of consumption within its area and they are currently evaluating how it can best target demand management measures. The cost of the scheme was approximately £110,000 with some small on-going costs.

Case Study Summary: SODCON Consumption Monitoring Study

Organisation: Anglian Water

Contact: David Scales
Henderson House, Lancaster Way, Ermine Business Park, Huntingdon, Cambs. PE18 6XQ
Tel: 01480 323944

Initiative Summary: The SODCON survey has been collecting data about water usage since 1992. It is currently the most comprehensive study of domestic consumption in the industry. A sample of approximately 2000 households who were charged by rateable value were selected for the study. These households were installed with external meters and data loggers which recorded household consumption every fifteen minutes. Households monitored were surveyed in clusters, and classified according to the ACORN system. A sub-set of 100 were selected for special investigation and these were known as "The Golden 100". Each property had in addition to its external meter, every separate water using appliance monitored individually at its point of use.

The objectives of SODCON were:

- To find an explanation of the factors that determine water demand
- Details of water consumption patterns across different unmeasured households
- Estimates of per capita use
- Data on night time use and minimum night flows, in order to develop an economic leakage control model
- Tariff development

Comments: The SODCON survey has provided a range of key statistics for the Company. These include:

- 15% reduction in demand as a result of metering
- 25-30% reduction in peak demand as a result of metering
- 70% of households in the Anglian district will be better off on a meter
- 121.76 litres per person per day for a household with four occupants, July 1995- June 1996
- On average, only 6% of per capita consumption was used outside the home. This increases to 25-30% during the summer peak.

SODCON has provided Anglian Water with robust figures with which to plan investment, future water sources, and figures with which to forecast supply and demand.

Case Study Summary: Evaluating Water Savings with Precise End-Use Data (Boulder, Colorado, USA)

Organisation: Aquacraft inc, Water Engineering and Management

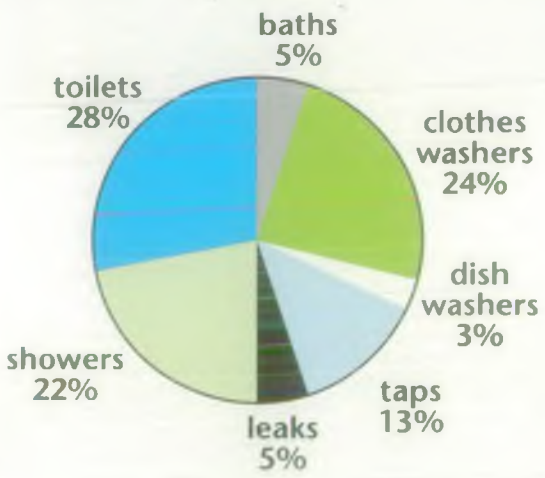
Contact: Tel: USA (303) 785-9691

Initiative Summary: Trace Wizard 2.0 for Windows 95 is a software package enabling water companies to evaluate end use water demand patterns on the basis of a single flow trace taken at 10 second intervals from the customer's water meter. These patterns constitute a comprehensive disaggregation of uses e.g. indoor and outdoor, washing machines, toilets, etc., and can provide data on volumes, duration, peak and mode flow of each type of water use.

In 1994, Trace Wizard was used to assess the water use patterns of sixteen metered homes of varying sizes in the Heatherwood neighbourhood near Boulder in Colorado. In 1995, fourteen of the sixteen householders involved in the previous study were still in the same houses and all agreed to participate in a second stage of the study which involved retrofitting their homes with free or subsidised water conserving fixtures. Trace Wizard was again used to assess the patterns of water use. As shown below in a selection of the figures produced from the project, the technique not only allowed an assessment of the pattern of water use in each household but also facilitated an assessment of how each component of water use changed following the retrofit programme. Whilst a specific discussion of the results of the study is not provided here, the figures presented below illustrate the potential of the technique for use in demand assessment and management.

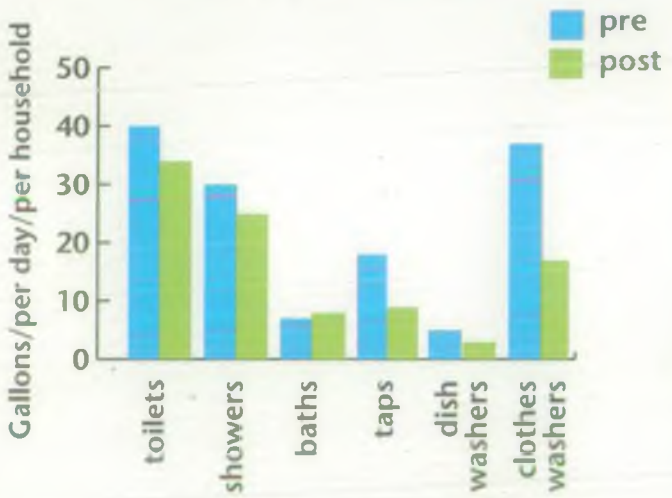
Indoor Water Use

Heatherwood, June-Dec. 1995



Water Use by Category

Pre and Post Retrofit



section 7

Metering Schemes

Metering schemes are increasingly being acknowledged within the UK water industry as a key means of reducing overall water use and monitoring consumption patterns. Many companies are being considerably more proactive than previously in offering incentives to existing to customers to have a meter installed. Where necessary, some companies have also introduced a variety of compulsory metering schemes. The three case studies presented in this section reflect these changes of approach within the Industry.

Case Study Summary: Hosepipe Metering Scheme

Organisation: Tendring Hundred Water Services

Contact: Martin Henderson
Mill Hill, Manningtree, Essex CO11 2AZ
Tel: 01206 399200

Initiative Summary: This scheme, which is in effect throughout the company area, and is one of a number of similar schemes in the industry, aims to ensure that all hosepipe users are registered and metered by the year 2000. Although this is a policy decision it is also expected to reduce consumption, especially at peak demand periods.

All customers will be supplied with meters, those who are registered hosepipe users will be required to keep them, but those who aren't will be given the choice of returning to the rated system after a 12 month trial period, during which time comparative bills will be provided showing the differences due to metering.

Comments: Approximately 10,000 out of a possible 50,000 unmetered customers have so far taken up the option. No savings have yet been identified, but general trends are currently being studied. Costs per meter connection have averaged about £180 each.

Case Study Summary: Water Metering

Organisation: Thames Water

Contact: Customer Helpline
Nugent House, Vastern Road, Reading, Berkshire RG1 8DB
Tel: 0645 200818

Initiative Summary: Thames Water are offering to fit a water meter free of charge and giving home owners the opportunity to try it for one year. To help people work out how much they would have to pay on a meter, Thames included a special water bill calculator in the promotional letter they sent out to customers (Anglian Water and several other companies have also developed their own "calculators"). If after the first 12 months a customer is unhappy for any reason, they need to inform Thames Water, who will switch them back to the rateable value system within the following 3 months.

Case Study Summary: Eco-Tariff Pilot Study

Organisation: North Surrey Water

Contact: Karen Hilditch

Millis House, The Causeway, Staines, Middlesex TW18 3BX

Tel: 01784 426240

Initiative Summary:

The aim of this rising block tariff trial is to encourage low water use and to test customer response to a range of tariffs. Letters explaining the scheme were sent to a total of 880 domestic metered customers in two representative districts (Shepperton and Staines) with a target of 20 volunteers needed. The response far exceeded their expectations, with a total of 315 customers now part of the study.

Due to the large response customers were asked to read their own meters on 1st August for the start date of the scheme. In 50 cases where customers were unable to read their own meters, North Surrey Water took readings.

The tariff bandings for the period of the trial 01/08/97 to 31/03/98 are as follows:-

0 - 45 m^3 = £0.31 per cubic metre
46 - 90 m^3 = £0.6211 per cubic metre
>91 m^3 = £1.24 per cubic metre

Comments:

So far the following findings have been ascertained from the responses received from customers:

- 48% of customers had their meters installed last year as part of the sprinkler campaign
- approximately 70% of respondents appear to be single occupancy households
- there is a high level of customer awareness of the financial advantages available for careful water use

Integrated Water Conservation Schemes

This section highlights two intensive schemes which have employed a range of initiatives in combination to achieve reductions in household consumption. The first, a relatively small scheme instigated by Yorkshire Water following the drought in 1995, is focused on three villages in Wharfedale in Yorkshire. The second is a larger initiative called "Watersmart" which operates under the stewardship of Eaga Ltd. Several water companies, including Yorkshire Water and Essex & Suffolk Water, have recently started Watersmart trials. The Essex & Suffolk Water trials are briefly described below.

section 8

Case Study Summary: Watersmart

Organisation: Essex and Suffolk Water

Contact: Clare Ridgewell
Hall Street, Chelmsford CM2 0HH
Tel: 01245 491234

Initiative Summary: This scheme promoted by Eaga has started a trial in the area of Chelmsford targeting 1860 domestic properties. Households were first approached by letter asking them to make an appointment. Initial scepticism was overtaken by word of mouth once vans were seen out in the area, with people approaching the vans directly to make appointments. The free service offered included:

- replacing washers in taps
- replacing shower heads with high performance self cleaning heads
- fitting cistern devices
- fitting water butts
- fitting rain diverters
- identifying and fixing leaks
- leaving the householder with an information pack and answering any questions

Progress Summary: To date 74% of domestic properties have received this service with the programme ongoing. In percentage terms, the scheme proved more popular with unmeasured households, with less than 30% of the 123 metered households taking up the offer. Those households that didn't want "Watersmart" fell into 2 categories: DIY enthusiasts and those that have recently had their bathroom or kitchen refurbished.

Preliminary results point to a 10% water saving from participating properties. Time taken per household was around 45 minutes. Offering the service on Saturdays and Sundays produced a very positive response.

The scheme is in progress and further results will become available as data are collected.

Case Study Summary: The Kettlewell, Starbotton and Buckden Scheme

Organisation: Yorkshire Water

Contact: Sue Slack
West Riding House, 67 Albion Street, Leeds LS1 5AA
Tel: 0113 2312584

Initiative Summary: Kettlewell, Starbotton and Buckden are three villages in the Yorkshire dales. Substantial increases in population over the summer months have recently resulted in a need to tanker water in by road to these villages, which otherwise rely on spring sources. A pilot project was created by the water conservation team to reduce demand in the summer months and so avoid the need for tankering. A total of 137 households out of 384 agreed to participate: the project then involved the installation of water saving devices such as Hippos and tap re-washering. In conjunction with this, leak detection and repairs have been carried out on both internal and external pipework and meters and leakage reduction instruments have been installed on the distribution system.

Comments: The project is currently in progress; final results will be available after 12 months, however, project costs are estimated at around £50,000. There has been a consistent drop in consumption levels from 1995-97 in the three villages. So far, it is estimated that 23% of water has been saved, the breakdown for this figure is currently being processed by Yorkshire Water.

Education and Information Programmes

Although there are some water conservation or demand management measures which can be implemented without accompanying behavioural changes on the part of the consumer, the full potential for saving water in the UK can only be realised with such changes. Whilst offering financial incentives is one potential means of creating changes in behaviour, informing consumers of the reasons behind the need to change their current patterns of water use is equally important. In view of this, water companies, as well as a range of other organisations have become increasingly active in recent years in devising education and information programmes which have the long term aim of reducing water consumption. Many of these programmes recognise that in addition to informing water users of the limited resources available, there is a need to provide information and ideas which show how consumption might realistically be reduced.

As with all education and information programmes, different groups of users need to be targeted in different ways and the techniques used need to be accessible, relevant and original. The case studies presented below are intended to illustrate the range of programmes currently being employed, with an emphasis on those which incorporate relatively new ideas or approaches. These include a curriculum based educational pack for schools developed by Southern Water, a business information service offered by Severn Trent Water and a "do it yourself" water audit leaflet produced by Bristol Water. Most water companies have also developed water efficient gardens, often in partnership with well-known gardens or educational establishments (e.g. Mid-Kent Water/Wye College and Thames Water/Kew Gardens) as well as advisory services through telephone hotlines or radio programmes. The specific example described below is North West Water's garden at Tatton Park, where master classes in water efficient gardening are offered by the Head Gardener. An initiative not specifically highlighted below, but recognised as helpful to the profile of a water company in specific areas, is the use of mobile water conservation units which are now operated by the majority of water companies.

Although it is difficult to gauge the impact of general education and information programmes on water use, the cost of some of the schemes, and the level of uptake, have been provided where available.

section 9

Case Study Summary: Play - 'Silver & Pearls'

Organisation: Thames Water

Contact: Phil Harris
Nugent House, Vastern Road, Reading, Berkshire RG1 8DB
Tel: 01189 593703

Initiative Summary: Silver and Pearls is a musical play in eight scenes for primary schools. It was commissioned by Thames Water and developed with the help of pupils and teachers. It has been given to all schools in the Thames Water Utilities water supply area with the aim of promoting water conservation to school children in an imaginative and original way. It is targeted at the primary school children and their parents, their teachers and governors.

This fantasy musical play features the Aztec rain god, Tlaloc, who returns to earth to tell his audience about the importance of water to his ancient civilisation. He recruits children to be his helpers as they begin a musical journey to spread the message about the need to conserve the precious silver and pearls of water as they drop from the sky.

Schools who request the free education pack receive sets of the play, a musical score and audio cassette of music and sound effects.

Schools producing the play can enter their work in a variety of competitions, which include poster design, or writing new songs to promote the efficient use of water. Prizes will be awarded for the best submissions.

Comments: Silver and Pearls was launched in March 1997 and the response to the play has been very enthusiastic. It has received coverage in both local and national media (Guardian 4 March 1997). To date, Thames Water have given out over 2300 packs of which 2046 have been to primary schools in their region, representing over 40% of all primary schools. The remainder of the packs have been requested by other establishments, local interest groups, pressure groups, etc.

During June and July, Thames Water were contacted by 12 schools who invited them to their productions of the play. In total 15 schools have produced the play to date.

The total cost of the Silver and Pearls project was approximately £79,000.

Case Study Summary: Water Wise

Organisation: Southern Water

Contact: Jon Crooke
Southern House, Lewes Road, Falmer, Brighton BN1 9PY
Tel: 01273 663660

Initiative Summary: 'Water Wise' is an education pack, aimed at Key Stage 2 children (age 7-11). It is distributed free throughout Kent, Sussex, Hampshire and the Isle of Wight. The resource spans a wide range of curriculum areas, from Environmental Studies, History and English through to Geography and IT. It comprises three elements: a teacher's guide, a series of eight activity cards plus data sheets, and a newspaper, 'The Splash'.

The activities include:

- finding articles in the newspaper to do with rainfall
- comprehension exercises
- finding out how much water they use at home
- suggesting ways of reducing water use
- practical experiments to learn about water expanding as it freezes and many more similar activities.

There is also a supporting video called 'A Question of Public Health', produced for an adult audience. It is included with the resource to give teachers a background to the modern water industry. The objective is to make children aware of water conservation, and through them, their families.

Comments: The cost of the scheme was £45,000. Savings achieved are impossible to quantify. Southern Water sent the pack to all schools in their area and 537 (34%) responded positively asking for more packs to be sent.

Case Study Summary: Business Information Service

Organisation: Severn Trent Water

Contact: Jo Dempster
Severn Trent Water Limited, 2297 Coventry Road, Birmingham B26 3PU
Tel: 0121 7224505

Initiative Summary: Severn Trent Water have identified a number of business customers within the region, whose needs and requirements differ greatly from those of the domestic user. In recognition of this, STW offer complete water cycle consultations, which includes giving useful advice about water efficiency. These usually last for one day, are free, and the resultant relationships mean that STW are able to offer additional services to these customers.

Comments: An example of the success of the initiative is the working relationship that has been developed with Kingsmill. Representatives from STW have provided them with risk assessments and advice on water conservation. In return Kingsmill ensure that their site engineer is in attendance during any repair work that STW carry out. This ensures that no water mains are turned off, thus causing no disturbance to day to day activities. Due to the advice given by Severn Trent, Kingsmill's water consumption is at the same level it was five years ago, despite the fact that they have built developments on their existing sites.

Case Study Summary: Greencare

Organisation: Three Valleys Water

Contact:

Frederic Devos
Three Valleys Water, PO Box 48, Bishops Rise, Hatfield, Hertfordshire AL10 9HL
Tel: 01707 277170

Initiative Summary:

The 'Greencare' scheme is focused on sports clubs in towns and rural areas throughout the company's supply area in parts of Hertfordshire, Bedfordshire, Essex and North London. Its objective is to promote a sensible watering regime of grass playing sports surfaces. Greencare invited sports clubs to sign up to the scheme's 11- point guidelines for keeping turf in top condition using a minimum of water. In return the sports clubs are entered into a monthly draw in which they can win £500 for the charity of their choice.

The 11 points included :

- night time watering if possible
- cutting grass less often during drought
- wetting agents to increase water percolation into the soil to avoid run-off
- good choice of seed
- regular aeration during winter and spring
- using a moisture meter for the soil

Comments:

The following is a list is of all clubs participating in the scheme:

North Church Cricket/Football Club	Harpenden Golf Club
Northwood Golf Club	Watford Football Club
Wembley Stadium	Chesham United Football Club
Stevenage Bowls	Hanbury Manor Golf Club
Shenley Cricket Centre	Luton Town Football Club
Finchley Bowling Club	London Borough of Hillingdon
Harpenden Common Golf Club	Brookmans Park Golf Club
Verulam Golf Club	Mid Herts Golf Club
Kings Langley Cricket Club	Stevenage Borough Football Club
Chorleywood Golf Club	The Chiltern Hospital
Beaconsfield Golf Club	Holmer Green Sports Association
Batchworth Park Golf Club	Manor Lodge School

The scheme is in progress with no results available to date.

Case Study Summary: National Trust Gardens

Organisation: National Trust

Contact: Rob Jarman
33 Sheep Street, Cirencester GL7 1RQ
Tel: 01285 651818

Initiative Summary: Throughout all National Trust gardens awareness of water saving techniques is being raised through their staff magazine 'Views'. Water saving measures being used include:

- repairs to the leaky pipe system
- rain water collection
- mulching
- watering at times which minimise evaporation

Comments: The costs for these initiatives have been low and were paid for out of their existing budgets. They required careful planning by the head gardeners. Advice to National Trust members was given in the summer 1997 edition of the members magazine, this is circulated to all members and is available in National Trust Shops.

Case Study Summary: Low Water Garden at Tatton Park & Master Classes by Head Gardener

Organisation: North West Water

Contact: Jo Dimes
Dawson House, Great Sankey, Warrington WA5 3LW
Tel: 01925 234000

Initiative Summary: The garden is within a National Trust owned stately home, Tatton Park, Cheshire. The Head Gardener, Sam Youd, and his team have planned and built the garden to show what type of plants grow best using a minimum amount of water and conserving as much moisture as possible. It is divided into four sections; lawn and border, the container garden, the vegetable patch and the Japanese garden. In each section plants are grown using only natural rainfall. The examples and ideas can easily be adopted by the amateur gardener.

Leaflets on water efficient gardening are also available.

Free gardening masterclasses are held at Tatton by Sam Youd, who advises how to get the best out of a garden even under conditions of low rainfall. Two such classes have been held so far and have proved very popular, each with their complement of 20 pupils.

Concluding Comments

General

"Saving Water - On the Right Track" has been prepared at a time when demand management is becoming increasingly important in regard to ensuring the sustainable utilisation of water resources in the UK. The importance of this issue was highlighted at the Water Summit convened by the UK Government with water companies in May 1997 and the urgency of the response required from the water companies to the 10-point plan put forward at the summit. The range of activity and level of detail provided in many of the Water Efficiency Plans issued by the water companies in February 1997 also emphasise the current high profile of the need to save water.

The Structure and Purpose of this Document

There are two aspects which distinguish this document from previous reviews of water saving and efficiency in the UK. The first is that, although encompassing the UK Water Industry, it also includes a wide range of initiatives being employed by business, industry, local authorities and other organisations. The second is that it focuses both on the type of water saving practice or technology being employed and, just as importantly, evidence of the actual costs and potential impacts involved with each initiative.

Whilst the Environment Agency applaud all genuine attempts to reduce water use, it is hoped that through focusing on the genuine costs and benefits of water saving initiatives, future revisions of this document will ultimately assume the status of guides to "Good" and even "Best" practice with respect to saving water.

Increasing Awareness and Activity but Few Results

What has become apparent in undertaking the review is that there is an increasing awareness of the need to save water and that it is possible to do so. This has been reflected in the wide range of initiatives being employed outside the water industry (e.g. water management in buildings, waste minimisation). What is also apparent, however, is that there are many initiatives inside and outside the water industry for which results are either not yet available or for which there is as yet insufficient confidence in the results for them to be released and published. It is possible that these are the main reasons for what has generally been a disappointing response from the industry in key areas (e.g. leakage reduction, metering and consumption monitoring schemes) in which it is known that there has been considerable activity involving most companies in recent years. One area in which there has also been considerable activity is in the area of relatively low-cost education and information programmes targeted at a wide audience.

Future Developments to Look Out For

Perhaps the most interesting area of development is the use of intensive "integrated water conservation schemes". Essex & Suffolk Water, amongst others, have recently instigated trial schemes of this kind with promising results.

Summary-"On the Right Track"

There is little doubt that the overall impression is one of substantially increased water saving activity in recent years and an increasing realisation that such savings are desirable, achievable and often profitable. It is clearly important that this trend continues, since the most sustainable water resource strategy for the UK as a whole will be one in which demands are managed to their full potential. There are encouraging signs that in this respect moves to save water in the UK are "on the right track".

Organisations Contacted

ADAS
Anglian Water
Aquacraft Inc.
Aquasaver Ltd
Armitage Shanks
Aylesford Newsprint Limited
BNFL
Bournemouth and West Hampshire Water
BP Chemicals
Bradford Metropolitan Council
Bristol Water
British Bathroom Council
Building Research Establishment
Business in the Environment
Cambridge Water
Carrick District Council
Chester Water
CIRIA
Devon and Cornwall Housing Association
DoE Northern Ireland
Dynamco Ltd
Eaga Services Ltd
East of Scotland Water Authority
Environment Agency Water Resources Staff
Environmental Technology Best Practice Programme Environmental Helpline
Essex and Suffolk Water
Folkestone and Dover Water
Global Action Plan
Going for Green
GU Projects
Hartlepool Water
Hilliers Nursery
Kirklees Metropolitan Council
Lincoln and Louth NHS Trust County Hospital
Loughborough University
MAFF
Mid Kent Water
Mid Southern Water
National Environmental Technology Centre
National Trust
North of Scotland Water Authority
North of Scotland Water Authority
North Surrey Water
North West Water
Northumbrian Water
Nottingham Trent University
OFWAT
Oxfordshire County Council
Pegler Ltd.
Portsmouth Water
Royal Borough of Kingston
RSPB
Severn Trent Water
South East Water
South Staffs Water
South West Water
Southern Water
Sutton and East Surrey Water
Tendring Hundred Water
Tescos
Thames Water
Three Valleys Water
Truro College
UK Automatic Meter Reading Association
University of Hertfordshire
Washroom International
Water Service, Belfast
Welsh Water
Wessex Water
West of Scotland Water Authority
Wildfowl and Wetlands Trust
WRc
Wrexham Water
Wye College
York Waterworks
Yorkshire Water

Acknowledgements

The Environment Agency would like to acknowledge all those organisations who have provided information as part of this review of water savings initiatives in the UK.

ADAS
Anglian Water
Aquacraft inc., Water Engineering and Management
Aquasaver Ltd
Armitage Shanks
Aylesford Newsprint Limited
Bournemouth and West Hampshire Water
Bristol Water
Business in the Environment
Carrick District Council
Eaga Services Ltd
Environment Agency Water Resources Managers & Demand Management Co-ordinators
Environmental Technology Best Practice Programme (ETBPP)-Environmental Helpline
Essex and Suffolk Water
Hilliers Nursery
Kirklees Metropolitan Council
Lincoln and Louth NHS Trust County Hospital, Lincoln
Loughborough University
MAFF
Mid Kent Water
National Environmental Technology Centre
National Trust
North Surrey Water
North West Water
Nottingham Trent University
Oxfordshire County Council
Pegler Ltd.
Portsmouth Water
Royal Borough of Kingston
Severn Trent Water
Southern Water
Tendring Hundred Water
Thames Water
Three Valleys Water
Truro College
United Kingdom Automatic Meter Reading Association
University of Hertfordshire
Washroom International
Wessex Water
Wye College
Yorkshire Water

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 to offer the best service and value for money.

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