

# 5 steps to sustainable water use



# Working together to save water



Saving water is not just an environmental initiative - it could also save your organisation significant sums of money. By making small behavioural changes, your business could see big benefits.

## Operational costs

Water use is an element of your company's operational costs and can easily be reduced, saving you money. In addition to reducing your water bill, you could also make savings on your energy bills by using less hot water.

## Regulatory risk

The Water Supply (Water Fittings) Regulations 1999 main purpose is to prevent waste, misuse, undue consumption and the contamination of wholesome water supplies. As a minimum, your organisation must comply with Regulations.

See Information card 1.

## Environmental impact

Reducing your water use will help to protect the environment and lessen your carbon footprint.

## Reputation

Taking steps to manage your environmental impacts will help to position your business as a socially and environmentally responsible company, which will be valued by clients, investors, the public and your staff.

## Access to external investment

With more stringent regulation, financial institutions consider good environmental management as an indicator of overall business management.


This guide focuses on general water use in commercial organisations; it does not cover process water use. We encourage each site to look at how water is used and investigate opportunities to reduce this amount.

Further information on water use in specific processes can be found on the Envirowise website:  
[www.envirowise.gov.uk](http://www.envirowise.gov.uk)

# Most businesses can reduce their water use with a few simple steps.

**1** **How much water do you use?**


- Calculate your water consumption
- Benchmark your site's water use



**2** **Tackling leaks and identifying excess water pressure**




**3** **Reducing your water consumption**



**4** **Changing water use behaviour**

- Educating water users
- Maintenance programmes



**5** **Monitor savings and report on your success**

- Monitor any reduction in water consumption
- Monitor any changes in energy savings
- Report on your success



Information cards on the following topics are also included in this guide:

**Information card 1**

- Water Supply (Water Fittings) Regulations 1999
- The Water Technology List and Enhanced Capital Allowance Scheme

**Information card 2**

- Understanding your bill

**Information card 3**

- Meter read record sheet
- Water audit sheet



# 1

## Step 1: How much water do you use?



### Calculate your water consumption

A useful measure of water consumption is the Average Daily Usage (ADU). This can be used to produce an outline of your water consumption over time, known as a Water Demand Profile. The profile clearly illustrates any changes in water use by your premises that may not be otherwise apparent.

### To produce your profile:

- Take all your previous water bills (over at least three years if possible) and group them together into individual years.
- Identify the total volume of water used by your premises by adding the water volumes (shown as m<sup>3</sup>) on your bills. This can be done for any period, but is most commonly done on an annual basis or quarterly if your water use is likely to vary seasonally.
- Calculate the ADU by dividing the total volume of water used by the number of days in the period. For example, if an organisation uses 10 cubic metres (m<sup>3</sup>) of water in 10 days, the ADU would be 1m<sup>3</sup> per day.

### Conversions

- 1m<sup>3</sup> = 1 cubic metre
- 1m<sup>3</sup> = 1,000 litres
- 1Ml = 1,000 m<sup>3</sup>
- 1m<sup>3</sup> = 220 gallons
- 1Ml = 220,000 gallons

Please note that if you have more than one water meter you will need to calculate the ADU based on the combined meter readings.

Sites where consumption remains relatively stable should be able to note a reduction in a much shorter monitoring period, for example through weekly reads, whereas sites with seasonal variation should review changes in annual consumption.

A good visual appreciation of water demand can be gained by plotting this data on a graph to show your Water Demand Profile.

Enter the details in the table below:

Year	Consumption for Q1	Consumption for Q2	Consumption for Q3	Consumption for Q4	Total annual consumption	ADU





By producing your Water Demand Profile for previous years, you can see how your water consumption has changed over time. Generally there should not be a significant increase in your ADU from year to year. If there is any significant increase or decrease in your ADU then there should be an obvious reason for change, such as an increase in numbers of staff or a change in use of a building.

Step 2 will explain what to do if you discover a large increase in your ADU between years for which you can find no reasonable explanation.

### **Benchmark your site's water use**

Information is available to enable you to benchmark consumption against sites of a similar nature. Depending on your sector, you may need to calculate a different measure of water use from your average daily usage, for example, m<sup>3</sup> per employee per annum or m<sup>3</sup> per m<sup>2</sup> floor space per annum.

# 2

## Step 2: Tackling leaks and identifying excess water pressure



### Finding & fixing leaks

If your Water Demand Profile shows a significant increase in water consumption for which there is no obvious explanation, it is possible that you have a leak on one of your underground water pipes.

Leaks may occur on the supply pipe to your premises or possibly (if you have them) on the network of underground pipes that distribute water around your site.

### Finding leaks on your supply pipe

You are responsible for your supply pipe. This will generally run between your water meter, usually on the boundary of your property, and the first point of entry of water into your building.

### To identify a leak on your supply pipe, follow these steps:

- a) First locate your water meter. It will normally be found outside the front of your property under a cover.
- b) At a time when your premises are NOT in use, turn off your water supply at your inside stop valve. This is generally located where your supply pipe enters the building. You should ensure that no water is being used in your building and notify all persons that you are going to shut off the water supply.

c) You should now return to your meter and there should be no movement on the meter dials. If the dials are moving, recheck that all fittings inside the building are turned off and that there are no cisterns filling.

d) Leave the stop valve shut and read the meter half an hour later. If the meter dial has moved, there may be a leak. If you have more than one water meter, you should check each one.

e) You should then open the stop valve. This will restore the water supply to your building and you should ensure that all fittings (e.g. flushing cisterns) that have been disconnected are once again functional.

### Finding leaks on your distribution pipe

In addition to your supply pipe, you might have a network of underground water distribution pipes on your premises.

These leaks may also become apparent through an increase in your Water Demand Profile, especially if you cannot attribute this to a supply pipe leak.

a) Choose a time when your premises are NOT in use, and ensure that no water is being used in your building. This can be done by making sure that all water fittings are turned off, as detailed in point 'b' of the 'Finding leaks on your supply pipe' section.

b) Once all of the water fittings have been turned off, you should take a reading from your water meter. You should make a note of the figure, together with the date and time. If you have more than one meter, you will have to take a note of all meter readings. You can enter the reading in the table below.

c) You should leave your water fittings turned off for at least several hours, for instance overnight or over the weekend. The exact length of time you can leave your system shut down will obviously depend on the nature of your premises and what is convenient for you.

d) After this period you should read your water meter. You can enter this in the table below.

**Information card 2**  
*explains how to read  
your meter.*



During the leak test, no consumption should have registered on the water meter and so there should be no difference in the meter readings at the start and the end of the leak test.

If there is a significant increase between the reading at the start and end of the test, then it is possible that you have a leak on your underground pipes or alternatively water going to waste above ground such as overflowing tank cisterns.

### **Repairing your pipes**

You are responsible for the maintenance and repair of your pipes. It is to your advantage to fix any leaks as soon as possible, as you will be paying for any wasted water.

Fix all visible leaks and overflows noted during the audit. A dripping tap could be wasting as much as 9-litres per day. A minor overflow, estimated as a 3mm stream, could lose as much as 350m<sup>3</sup> per year.

### **Review water pressure across your site**

High water pressures can be experienced on lower floors where water is supplied by a gravity system from a break tank in the roof, or where booster pumps are used to ensure adequate pressure on top floors. High pressure can result in excessive water consumption and can cause or exacerbate leakage.

For example, taps on the top floor of a tall building may have a flow rate of 8-litres per minute, whilst those on the ground floor, without pressure reduction, may have flow rates of anything up to 60 litres per minute, depending on the fitting type.

### **Lower excessive water pressure**

Pressure-reducing valves (PRVs) can be used to control the pressure across the site. They can be fitted on the supply to each floor, the down legs of a gravity fed system, or the risers in a pumped system. Flow regulators can also be installed to each fitting affected if more appropriate. Visit [www.wras.co.uk](http://www.wras.co.uk) for details on approved products.

Start	m <sup>3</sup>
Start	m <sup>3</sup>

# 3

## Step 3: Reducing your water consumption



Having checked for and repaired any leaks, the next step is to look for savings in water consumption. There are various water efficient devices available to help reduce your water consumption.

**However, it's important to ensure that reducing consumption does not affect hygiene standards.**

If you have had an external audit or Water Regulations Inspection, recommendations may have been identified. It is now important to determine measures suitable for each area. The Water Regulation Inspection may include infringements which are enforceable. If you have not had an external audit or Water Regulations Inspection, you will need to compile a checklist of all water fittings on your premises together with their location.

**Information card 3** in this pack will help you to plan your work ensuring you do not omit any fittings from the process. Check all water fittings bearing in mind the following tips and making note of possible corrective actions:

### Taps

- a) Plugs in all wash-hand basins and sinks can reduce unnecessary running of taps.
- b) Tap flow regulators can reduce the flow of water from the taps by up to half.
- c) Percussion taps (push taps) deliver water for a pre-determined period and help avoid waste from running taps. If push taps remain stuck on, or if their run time is longer than ten seconds, you should fix them or contact the supplier to arrange resetting the run times.
- d) Sufficient lagging of hot pipes will help to minimise the need to run the tap for a long time to get hot water, as well as helping to conserve heat energy.
- e) Repairing a dripping tap could save as much as 9-litres of water a day. In most instances all that is required is a new washer.

### Toilets

- a) Checks should be made to ensure that cisterns, whether for storage or flushing, are not overflowing and causing water to waste through warning pipes. In such instances, necessary adjustments or repairs should be made to the float-operated valve or other device that controls inflow of water to the cistern.

- b) A save-a-flush can be inserted into 7-litre toilet cisterns, these toilets usually have a pull handle and were often installed between 1993 and 1999. The device will reduce each flush by 1-litre but is not suitable for dual-flush or slimline cisterns.
- c) A Hippo bag can be fitted into cisterns of 9-litres upwards to reduce each flush by 2-litres.
- d) Existing cisterns can be converted into dual flush systems. There are a number of suppliers providing devices that convert toilet cisterns of 7-litres upwards into a dual flush, allowing you to use a smaller flush.
- e) Install new low flush/dual flush toilets to provide a 4-litre/6-litre flush.

The Water Supply (Water Fittings) Regulations 1999 state that all new toilets should use no more than 6 litres per flush. Dual flush toilets should have a smaller flush of no more than two thirds of the full flush.

**You can request free water-saving tap, toilet and shower devices for your business property from [waterefficiency@thameswater.co.uk](mailto:waterefficiency@thameswater.co.uk)**



Visit  
[www.thameswater.co.uk/waterwise](http://www.thameswater.co.uk/waterwise)  
for further details on water  
efficient gardening.



## Urinals

- a) Flushing can be made more cost effective by installing passive infrared (PIR) flush control systems, so flushing reflects use.
- b) On average, an unmanaged cistern flushes four times an hour, 24-hours a day, using 315 m<sup>3</sup> of water, at a cost of £500 per year (based on 2008 prices). Reducing the flush frequency and preventing flushing out-of-hours can reduce this to 36 m<sup>3</sup>, which equates to just £57 per year.

The Water Supply (Water Fittings) Regulations 1999 state that the volume of water passing through a urinal must be controlled to prevent undue consumption and limit flushing out of hours.

**A PIR Urinal control will only cost around £150-£200 to install. On average, the urinal control will pay for itself through reductions in the water bill within 4-6 months.**

## Outdoors

- a) Collect rainwater for grounds watering. Visit [www.ukrha.org](http://www.ukrha.org) (UK Rainwater Harvesting Association) for further advice on collecting and reusing rainwater.
- b) Install and use water butts to harvest rainwater. Visit [www.thames.savewater.co.uk](http://www.thames.savewater.co.uk) to purchase your water butt.
- c) In summer, water early in the morning or in the evening to prevent evaporation and direct water at roots.
- d) Ensure hoses have trigger nozzles to provide more control of the strength and direction of the spray. They also prevent hoses from being left running when unattended.
- e) Check that outside taps are not dripping and lag them to prevent freezing in the winter.

Having identified areas where water efficiencies can be made, we recommend that you create an action plan so that corrective measures can be planned and accounted for.

It is important to ensure that work planned is compliant with the Water Regulations 1999.

See **Information card 1** for details.

# 4

## Step 4: Changing water use behaviour



### Educating water users

In order to promote behavioural change, everyone in your organisation should be made aware of the need to be water efficient. You should think about how you can engage staff in an awareness campaign to discourage wasteful behaviour and promote water conservation.

- Think about designating a member of staff or a team to champion water efficiency and promote the changes made.
- Establish a clear, accessible system for staff to report water related maintenance issues, such as leaks or push taps being stuck on, and ensure action is taken swiftly to reinforce the message that water is an important resource.
- Put up posters around your site to keep everyone informed of the work being carried out. Posters and stickers could also be used in bathroom and kitchen areas to remind staff not to leave taps running, and to only fill the kettle with the water they need.
- Send e-bulletins or place messages on your Intranet to keep staff informed of your campaign.
- Arrange a staff awareness day. This could include a range of activities such as asking staff to pledge to turn off the tap when they brush their teeth. This encourages your staff to take key messages home and will reinforce the good behaviour you are expecting of them on site.
- Visit [www.thameswater.co.uk/savingwater](http://www.thameswater.co.uk/savingwater) for tips on how to save water, calculate how much water you use and information on how to get hold of water-saving devices. **See chart below.**

### Maintenance programmes

Establish preventative maintenance programmes. For example, if overflows are not visible, then ensure regular checks are carried out to prevent any overflows going unnoticed.



# 5

## Step 5: Monitor savings and report on your success



### Monitor any reduction in water consumption

Monitoring your consumption as you implement change allows you to assess the success of measures implemented and provides information to feed back to staff and management.

A meter read record sheet is included in this pack to help you collate any meter readings you take as part of this plan.

Remember that the ADU calculation can be worked out for any period you choose provided you have the necessary meter readings. Ensure that you record the date of any installations and note any events that may lead to an increase or decrease in consumption, such as site closure or open days. This will allow you to take this into consideration when assessing changes.

#### Points to note:

- Try to read meters on the same day each week/month, to minimise the impact of change in use on different days of the week.
- Try to take the reading at the same time so as not to reduce/increase time covered.
- You should work on trying to reduce your ADU, as calculated during Step 1. The usage includes the weekend even if your site is closed then. Provided you continue to calculate ADU in the same way, you will be able to monitor reduction.
- You will need to know the number of employees you have if you wish to calculate  $\text{m}^3/\text{employee}/\text{year}$ . Combine part time roles to give full time employee number.

Ensure your water savings are reflected in your water bill. Should you receive a bill based on an estimated read, provide your own meter reads to ensure your reduced consumption is reflected in water bills.

You can do this online:  
[www.thameswater.co.uk](http://www.thameswater.co.uk)

### Monitor any changes in energy consumption

Reducing the volume of hot water used will reduce energy bills associated with heating and pumping, and in many cases the financial savings on energy could be greater than the savings on water. Therefore we recommend that any changes to reduce the volume of hot water be linked to regular electricity or gas meter readings as well as water meter readings.

The energy required to heat  $1\text{m}^3$  of water to  $60^\circ\text{C}$  from  $20^\circ\text{C}$  (room temperature) is 46.52 kWh. For each  $\text{m}^3$  of hot water saved,  $\text{CO}_2$  emissions will be reduced by 20kg, based on energy saving of 46.52kWh per  $\text{m}^3$ .

## Report on your success

### Internal reporting

It is important to feed back to staff on what progress has been made. Let them know when changes have been made and promote any reductions achieved in both water and energy bills.

#### For example:

- a) Posters in areas refurbished or fitted with water efficiency measures stating what has been done and why.
- b) Posters, emails, details on Intranet to state what reductions have been achieved by a change in practice or measures put in place.

### External reporting

There are many routes for promoting your work externally. Here are some examples:

- a) Ensure that your work to improve resource efficiency is reported in your Corporate Social Responsibility Report.
- b) Consider using this as a stepping-stone onto an accredited Environmental Management System.
- c) Enter your business for an environmental award such as the Environment Agency Water Efficiency Award, or check out local council and environmental business awards for your area.
- d) Send Thames Water a brief article on your site's efforts and the savings achieved.
- e) Post a report on the programme on your website and keep it updated with progress.

# Information card 1

## Water Supply (Water Fittings) Regulations 1999

### What are they?

The Water Supply (Water Fittings) Regulations 1999 are national requirements for the design, installation, composition and maintenance of water fixtures and fittings. They are designed to protect consumers and the environment by preventing waste, misuse, undue consumption and the contamination of wholesome water supplies. They replace the Water Byelaws in England and Wales, which Thames Water and other water suppliers have issued for similar purposes for many years. Similar provisions are contained within the Water Industry Act 1991.

### Who has to comply?

Owners and occupiers of both domestic and commercial premises. Anyone who installs plumbing systems or water fittings has a legal duty to ensure that the systems satisfy the 1999 Regulations.

### What do they cover?

In relation to the volume of water used on your site, the Regulations cover, but are not restricted to, the following:

- Fixing leaks on your property
- Minimum standards for the water consumption of WCs
- Controlled flushing of urinals
- Durability and water-tightness of fittings
- Minimising the length of pipe runs and therefore the draw-off time required for correct temperature water

### How do the Regulations affect you?

Water systems and fittings in premises that are, or will be, connected to the public water supply must comply with the Regulations. If you are planning to carry out certain plumbing work, you must obtain the prior consent from Thames Water by giving advance notice of the work in writing\* with any associated drawings. This includes the installation of water fittings in connection with the erection of any new building or structure, extension/alteration of the water system in any premises, material change in use of any premises or the installation of any fitting listed in section 5 of the Regulations.

\*Write to:

**Thames Water,**  
Water Regulations Department  
Ashford Common Water  
Treatment Works  
Staines Road West  
Ashford, Middlesex  
TW15 1RU



## Plumbers and the Regulations

The Regulations introduced the concept of an approved contractor to identify plumbers who are competent in the requirements of the Regulations. Approved contractor status carries certain statutory responsibilities which benefit plumbers and their customers. Thames Water runs an Approved Plumber scheme.

To confirm the benefits to you, or for further information, please call 020 8622 6919 or visit [www.thameswater.co.uk](http://www.thameswater.co.uk).

Non-approved plumbers should not undertake any work without giving Thames Water prior notice. If they undertake work that is found on later inspection not to comply with the Water Regulations, you could be liable to prosecution and a possible fine of up to £1,000. Successful prosecutions result in the offender having a criminal record.

## Where can I get help and advice?

The Water Regulations Advisory Scheme (WRAS) has published the Water Regulations Guide, which contains guidance from the Department of Environment Food and Rural Affairs (Defra) and a more detailed explanation of the requirements. This can be ordered

from WRAS at [info@wras.co.uk](mailto:info@wras.co.uk). WRAS also publishes a directory listing approved products that meet the requirements of the Regulations. This can be found at [www.wras.co.uk](http://www.wras.co.uk).

Defra's guidance on the Regulations can be found at [www.defra.gov.uk](http://www.defra.gov.uk). Here you can obtain a free copy of the Regulations, or you can purchase a copy direct from the HMSO.

## The Water Technology List and Enhanced Capital Allowance Scheme

The Water Technology List ([www.eca-water.gov.uk](http://www.eca-water.gov.uk)) catalogues water-wise technologies that qualify for the Enhanced Capital Allowance Scheme. The scheme enables businesses that pay corporation tax to claim 10 per cent first year capital allowances on investments in qualifying technologies and products that encourage sustainable water use.

All products listed on the Water Technology List are approved by the Water Regulations Advisory Scheme (WRAS). The list covers a range of equipment that reduces water wastage including showers, washing machines, waterless urinals,

industrial floor cleaning equipment, mechanical seals and vehicle washing. The requirements and timescales relating to WRAS approvals of water fittings can vary and so customers should ensure prior to purchasing any products that they have a current and valid approval.

There are a number of measures where WRAS approval is not applicable, such as shower timers, so do consider measures outside of this list. A range of water-wise products can be found at: [www.waterwise.org.uk](http://www.waterwise.org.uk).

## Useful websites

Thames Water	<a href="http://www.thameswater.co.uk">www.thameswater.co.uk</a>	General information, Approved Plumbers scheme
WRAS	<a href="http://www.wras.co.uk">www.wras.co.uk</a>	Approved products (Water Regulations 1999)
Defra	<a href="http://www.defra.gov.uk">www.defra.gov.uk</a>	Water Regulations 1999
Defra (ECA scheme)	<a href="http://www.eca-water.gov.uk">www.eca-water.gov.uk</a>	The Water Technology List, Enhanced Capital Allowance Scheme
Envirowise	<a href="http://www.envirowise.gov.uk">www.envirowise.gov.uk</a>	Environmental advice for businesses
CIRIA	<a href="http://www.ciria.org.uk">www.ciria.org.uk</a>	Benchmarking information under 'Downloads'
OGC Buying Solutions	<a href="http://www.ogcbuyingsolutions.gov.uk">www.ogcbuyingsolutions.gov.uk</a>	Benchmarking tool under 'Energy Menu'
Environment Agency	<a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a>	General information
DfES	<a href="http://www.dfes.gov.uk/valueformoney">www.dfes.gov.uk/valueformoney</a>	Information on 'Energy and Water Management for Schools' in the 'Good Practice' section
Waterwise	<a href="http://www.waterwise.org.uk">www.waterwise.org.uk</a>	General information, advice on products

# 2

## Information card 2

### Understanding your bill

#### Reading your meter

We encourage you to take readings and monitor your own water usage. When reading a meter, you only read the black and white numbers, not the red ones.

If it is safe and convenient for you to read your meter, you can submit a reading online by visiting our website at [www.thameswater.co.uk/meterreading](http://www.thameswater.co.uk/meterreading). Or, if you prefer, you can call us on 0845 9200 888, quoting your account number. You can also send meter readings by text message. Simply start a new text message and enter your account number, then add a space followed by your meter reading. Send this to 84771 and we will record this on your account.

#### 1 Property address

The details of the property to which this bill applies.

#### 2 Total payable

This shows the total amount due. If you have a payment plan, your account may sometimes appear in credit as you are making payments each month. Once the meter has been read again, the payments you have already made will be offset against these charges.

#### 3 Service charges

##### The water charge

Covers the cost of providing clean water to your property and is measured by a water meter.

##### The wastewater charge

Covers the cost of removing and treating the used water from your sinks, toilets, plumbed appliances, surface water and highway drainage.

#### 4 Volume charges

##### Water and wastewater

This is calculated by multiplying your water use in cubic metres by the price per cubic metre for water and wastewater.

#### 5 Fixed charge

The fixed annual charge is based on the size of the pipe that supplies your property. It includes the cost to treat highway and surface water drainage and maintain our pipes. The annual fixed charge is divided by the number of days in the year.

#### 6 Charges

The combination of your **4** Volume and fixed **5** charges.

#### 7 Meter number

This is the unique meter serial number and can be found on the meter dial. If you have more than one meter, they'll be listed here.

#### 8 Charged size mm

This is the size of the pipe that connects your property to the mains supply and is used to calculate your fixed charge.

#### 9 Volume used

The number of cubic metres used since your last bill. This is the difference between the new reading and the previous reading. (**1 cubic metre = 1,000 litres = 220 gallons**). Your bill will indicate if an estimated reading has been used.

Bill date		Water Services Bill			
24 May 2011		Tel: 0845 641 0002			
Account Number					
12345-67890					
ABC BUILDERS FERN ROAD LONDON E17 2AN					
<b>1</b> Property Address: ABC BUILDERS, FERN ROAD, LONDON E17 2AN					
<b>Your water services bill for 19 April 2011 to 9 May 2011</b>					
Overdue charges	Total new charges	Total payable	The total shown is due now		
£6624.47	£1372.34	£7996.81	<b>2</b>		
Overdue charges must be paid immediately					
See below					
<b>Service charges</b> 19 April 2011 to 9 May 2011 (21 days)					
<b>3</b> Water	823 m <sup>3</sup> @ 87.38p	<b>4</b> 719.14	<b>5</b> 59.68	<b>6</b> £777.82	
Wastewater	823 m <sup>3</sup> @ 53.35p	439.07	155.45	£594.52	
<b>Charges</b> £1372.34					
<b>Meter Readings</b>					
Meter number	<b>7</b> Charged size mm	<b>8</b> Previous reading	<b>9</b> New reading	<b>9</b> Volume used m <sup>3</sup>	
10 May 2011	03W020355	100 Main	220652	221164 estimated reading	512
10 May 2011	02A246701	0 bypass	25698	26009 estimated reading	311
<b>Total consumption m<sup>3</sup></b>				<b>823</b>	
If you would like to provide us with your own meter reading(s), call us on 0845 641 0002. We will then send you a revised bill					











Visit **Waterwisely** and see how much water you can save.

[www.thameswater.co.uk/waterwisely](http://www.thameswater.co.uk/waterwisely)