



# **Have you bottled it?**

How drinking tap water can help  
save you and the planet

## Acknowledgements

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### TYPICAL

CALCIUM .....  
MAGNESIUM .....  
POTASSIUM .....  
SODIUM .....  
BICARBONATE .....  
CHLORIDE .....  
SULPHATE .....  
NITRATE .....  
IRON .....  
ALUMINIUM .....

# **Have you bottled it?**

How drinking tap water can help save  
you and the planet

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**December 2006**





# Contents

<b>Acknowledgements</b> .....	ii
<b>Bottled water</b> .....	1
1. Drinking more and more .....	1
2. Isn't bottled water better for you? .....	2
3. Some potential health risks .....	3
4. "Purer" than thou .....	5
5. The environmental damage .....	6
6. The price of image .....	7
<b>The alternatives</b> .....	9
7. How much water do we need to drink? .....	9
8. Tap water .....	10
9. Tap water and your health .....	11
10. Regulating the water companies .....	13
11. The environmental benefits of tap water .....	14
12. Other options .....	14
13. Save water! .....	16
<b>Where to find out more</b> .....	17



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Purified water

Table Water

TEXTURE WIN

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# Bottled water

## 1. Drinking more and more

The trend for "taking the cures" in water spas started in 16th century France in places like Vichy-les-Bains and soon spread to the UK and elsewhere. The "curative" properties of bathing in these spring and mineral waters then expanded to include drinking water and, at the beginning of the 18th century, flasks of such water began to travel across the UK. The mineral waters were drunk for their supposed medicinal or health properties, whereas spring waters became well-known for being pure and cleansing.<sup>1</sup>

In recent years the market for these and other bottled waters has grown beyond recognition, across the world. Between 1994 and 2002 the global bottled water market has grown by almost 250%, from 58 billion litres to 144 billion litres in 2002. Much of this growth has been in Asian and Australasian countries, where the market has expanded by 500%, but even in western Europe, where the market is already large, there was 37% growth.<sup>2</sup>

In the UK alone, in 2005, the bottled water market was worth an estimated £1.7 billion (up from £1.57 billion in 2004) with around 2 billion litres sold.<sup>3</sup> Industry commentators note that:

"Since 2000 there have been 10 million new bottled water drinkers in the UK. More than half the population, that's 26 million adults, now drink over two billion litres every year, with growth expected at a rate of 6-7% year on year until 2010... 2.1 billion litres of bottled water were sold in the UK in 2004 - nearly 3/4 the size of the cola market." <sup>4</sup>

So who is selling it to us? The table below shows the market leaders who, between them, are responsible for around a third of the bottled water sold in the UK. The rest is made up of a wide range of small independent companies, with the Food Standards Agency's most recent list of officially recognised mineral waters (see "*Purer than thou*" below) including around 100 different companies.<sup>5</sup>

### The market leaders in bottled water in the UK, 2004

Water brand	Market share (by value)
Evian (Danone)	9.7%
Volvic (Danone)	7.3%
Powwow (Nestlé, in bottled water coolers)	7.2%
Highland Spring	6.9%
Buxton (Nestlé)	3%
Aqua Pura (Princes)	2%
Strathmore	2%

Source: Zenith International (March 2005) and The Times <sup>6</sup>

1 Dorothy Senior and Nicholas Dege - *Technology of bottled water*, second edition - 2005 - Blackwell Publishing

2 Dorothy Senior and Nicholas Dege - *Technology of bottled water*, second edition - 2005 - Blackwell Publishing

3 Food Standard Agency - Natural Mineral Water, Spring Water And Bottled Drinking Water (Scotland) Regulations 2006 partial RIA - Annex E: Partial regulatory impact assessment - 2006

4 Zenith International - UK Bottled Water Report (2005), [http://www.zenithinternational.com/market\\_industry\\_reports/report\\_list.asp?cat=2](http://www.zenithinternational.com/market_industry_reports/report_list.asp?cat=2)

5 Gateway to the European Union - Consolidated list of natural mineral waters recognised in the UK - May 2006 - <http://europa.eu.int/>

6 Zenith International - UK Bottled Water Report (2005), [http://www.zenithinternational.com/market\\_industry\\_reports/report\\_list.asp?cat=2](http://www.zenithinternational.com/market_industry_reports/report_list.asp?cat=2) and Times on line - *Turn back to your taps - we all pay the price for bottled water / The cost of bottled water* - 18 February 2006

Nestle says on its website<sup>7</sup> that it has 75 brands of bottled water, including not only Buxton (listed in the table), but also Perrier, San Pellegrino and Vittel. People may also be interested to know that Coca-cola owns Malvern bottled water, and although Pepsico sells Aquafina in the USA, it only sells bottled water in the UK through Britvic (Drench, and Pennine Spring).

## 2. Isn't bottled water better for you?

The size and rapid growth of the market means there have been plenty of analyses of why we are drinking more and more bottled water, and the following summarises a few of the reasons:

**Wealth.** As society becomes more affluent, we can afford to buy more bottled water (see *The price of image* below). All the major drinks sectors have recognised the value of consumers' growing premium tastes, and bottled water has become particularly profitable in restaurants.<sup>8</sup>

**Image.** Bottled water marketing plays heavily on notions of purity, peace, silence, nature - an antidote to our busy urban lifestyles. The product is also promoted heavily to 15-34 year old women and has become a "must have" fashion accessory.

**Taste.** Many people say that they simply do not like the taste of tap water, or they prefer the taste of a particular bottled water<sup>9</sup> (though see box *The blind taste test*).

One of the main reasons people give for drinking bottled water is health.

### The blind taste test

There is no convincing, independent research to show that bottled water consistently tastes better than tap water, in blind taste tests.<sup>10</sup> In fact, occasional ad hoc tests - for example undertaken by journalists when researching a story - seem to show the opposite. Most people can't tell the difference between tap water and bottled water.

## Health

Water companies are heavily regulated (see *Regulating the water companies* below) and one of their obligations is to announce publicly every water quality incident. Amplified by the media, this has probably contributed to the misleading impression that the UK has poor quality tap water, and has provided a major boost to the bottled water companies' business.

The allegedly superior quality of bottled water is emphasised in the companies' marketing, which plays heavily on images of purity, detoxification, and well-being. Moreover, at a time when obesity is a serious social concern, water seems like the perfect answer for a healthy lifestyle, with no calories, no additives, no added sugar (except for flavoured water, which often contains added sugar and/or flavourings) and no alcohol.

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7 [www.nestle-waters.com](http://www.nestle-waters.com)

8 Mintel - *Food & Drink - June 2003* - Bottled water - UK, Market Intelligence - June 2003 - Published by: Mintel International Group Ltd

9 Patrick Sullivan, Franklin J. Agardy and James J. Clark - *The environmental science of drinking water* - 2005 - Elsevier Butterworth Heinemann [adaptation]

10 *Fluid for thought* - Which? Magazine, August 2004



Interestingly, few bottled water companies now draw attention to any health benefits from the minerals in mineral water, which had been the original reason for drinking them. This may, or may not be due to a recent unequivocal statement from the World Health Organisation:

"In European and certain other countries, many consumers believe that natural mineral waters have medicinal properties or offer other health benefits. Such waters are typically of high mineral content and, in some cases, significantly above the concentrations normally accepted in drinking water. Such waters have a long tradition of use and are often accepted on the basis that they are considered foods rather than drinking water per se. Although certain mineral waters may be useful in providing essential micro-nutrients, such as calcium, *WHO is unaware of any convincing evidence to support the beneficial effects of consuming such mineral waters (our emphasis)*. As a consequence, WHO Guidelines for Drinking Water Quality do not make recommendations regarding minimum concentrations of essential compounds." <sup>11</sup>

### 3. Some potential health risks

Not only are there no convincing health reasons for preferring bottled water to tap water (see Tap water and your health below) there are some health concerns about bottled water. Indeed, the French senate advises people who drink bottled mineral water to change brands frequently, because the minerals in particular brands may be harmful in high doses, if consumed over a long period.<sup>12</sup>

#### Sodium

Many people, for example, are not aware that one of the common minerals in mineral water is sodium. Health professionals advise everyone to limit their intake of sodium, because it increases the risk of developing high blood pressure and the diseases associated with it, such as stroke and coronary heart disease. The most common source of sodium in our diet is salt - sodium chloride - and the Food Standards Agency recommends we eat no more than 6 grams of salt a day.<sup>13</sup> While mineral waters usually contain only trace amounts of minerals - including sodium - people with high blood pressure or who have had a stroke or heart attack should check labels carefully. A small and random sample of bottled mineral waters, undertaken for this report, showed sodium levels from as low as 3 milligrams per litre (Spa) to as high as 18 milligrams per litre (Fiji).

#### Contaminants

Perhaps the first high profile contamination scare was when the potential carcinogen, benzene, was found in Perrier water in 1989. More recently, in March 2004, bromate - another potential carcinogen - was found in Dasani water (produced by Coca-Cola, using a particular process to filter and bottle mains water).

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11 World Health Organisation: Fact Sheet No.256 - Bottled drinking water. October 2000. Quoted in The Chartered Institution of Water and Environmental Management (CIWEM) - Policy about Bottled Drinking Water - November 2005 - [http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

12 Emily Arnold and Janet Larsen - Earth Policy Institute - *Bottled water: pouring resources down the drain* - 2 February 2006 - <http://www.earth-policy.org/Updates/2006/Update51.htm>

13 Food Standard Agency - Ask Sam - 2005 - [http://www.salt.gov.uk/ask\\_sam.shtml#q2](http://www.salt.gov.uk/ask_sam.shtml#q2)

In Europe, natural mineral waters are frequently tested for physical, chemical and bacteriological quality by the companies that produce them. Health authorities can obtain these results on request, and around every two months independent laboratories also conduct tests to check the safety of the product.<sup>14</sup> However, even these tests cannot allay some health concerns.

## Antimony

Water bottles are now usually made from polyethylene terephthalate (PET). Antimony trioxide is used as a catalyst in the manufacture of PET, so PET typically contains several hundred milligrams (mg) per kilo (kg) of the heavy metal, antimony (Sb is its chemical symbol). This is rather a high level, since most rocks and soil contain less than 1 mg/kg.

Professor William Shotyk and his fellow researchers at the Institute of Environmental Geochemistry, at the University of Heidelberg in Germany, measured antimony in 15 brands of bottled water from Canada and 48 from Europe. Although all the water tested contained antimony at levels below the guidelines recommended for drinking water, Professor Shotyk commented that "There is unlikely to be a beneficial effect of Sb contamination".<sup>15</sup> He also noted that, in Japan, PET is manufactured using titanium, which is effectively insoluble and harmless - unlike antimony, which can be dissolved in water and is potentially toxic.

## Leaching

However, polymerisation - the process of producing plastic - is never perfect. It is possible that some potentially toxic chemicals may migrate out of the plastic product and into whatever is in contact with it. A plastic bottle can also absorb airborne chemicals, so it is important to store them carefully. In October 2005, for example, the BBC found that some bottles of Volvic had been contaminated with naphthalene (the chemical in mothballs), even though the bottles were unopened. Danone, the company that owns Volvic investigated the incident, and the Food Standards Agency recommends that all food and drinks should be stored away from any kind of household chemicals.<sup>16</sup>

### **Back to basics:**

*No longer the stuff of fashion, bottled water has become an everyday purchase for many people. It seems that many would rather buy a bottle of "basics table water" than simply turn on the tap.*

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14 Catherine Ferrier - *Bottled water: understanding a social phenomenon* - April 2001 - commissioned by the World Wildlife Fund - [http://assets.panda.org/downloads/bottled\\_water.pdf](http://assets.panda.org/downloads/bottled_water.pdf)

15 Prof. William Shotyk et al. - Institute of Environmental Geochemistry, University of Heidelberg - *Bottled Waters Contaminated with Antimony from PET* - <http://www.uni-heidelberg.de/press/news/news06/2601antime.html>

16 Food Standard Agency (FSA) - Eat well, be well - *Storing and preparing* - <http://www.eatwell.gov.uk/asksam/keepingfoodsafesamstoringpreparing/#A306011>

17 The portal to European Union law - <http://europa.eu.int/eur-lex/en>



## 4. "Purer" than thou

Most people are not aware that there are three different types of bottled water, conforming to different standards of purity and covered by European-wide legislation. Each Member State follows a similar system to the one described below for the UK so there is an official list, at European level, for all the Natural Mineral Waters formally registered and approved. As well as maintaining standards, the official list also aims to prevent producers from using an already existing name for their new product.<sup>17</sup>

### **Natural Mineral Water. This must:**

- come from a specified ground water source, which is protected from all kinds of pollution;
- be repeatedly analysed over a two year qualifying period;
- not be treated in any way to alter its original chemical and microbiological composition (though carbon dioxide can be added to make it sparkling);
- be officially recognised through a local authority, and registered with the Food Standards Agency ;
- provide certain information on the label, including the minerals it typically contains.

Examples: Evian, Highland Spring

### **Spring Water. This must:**

- come from a single, non-polluted ground water source;
- be registered with the local authority.

However, there is no formal recognition process and Spring Waters may undergo permitted treatments. Many Natural Mineral Waters first come on the market as Spring Waters, while they are undergoing the two-year testing period.

Examples: Powwow

### **Table Water. This can:**

- come from more than one source, and can include the public water supply;
- be treated to achieve compositional and microbiological requirements. Some companies add minerals, to replace those lost during treatment or to "enhance" traces of minerals already present.<sup>18</sup>

Examples: Some supermarket "own brand" bottled waters, in their "value" or cheaper ranges.

The infamous "Peckham Spring" bottled water, sold by Del Boy in the BBC's *Only Fools and Horses* sitcom would, technically, be a Table Water! However, the list of Natural Mineral Waters and Spring Waters provided by local authorities and kept by the Food Standards Agency helps law enforcement officers ensure that bottled waters are not being marketed using misleading terms. Calling his product "Peckham Spring" would imply it was a Spring Water so, had other events not come to pass, Derek Trotter would have had a visit from his local food law enforcement officers.

<sup>18</sup> British soft drinks - Bottled water questions and answers -<http://www.britishtsoftdrinks.com/htm/qa/BottledWater.htm> - website viewed on 26 September 2006

## 5. The environmental damage

The abstraction, processing, packaging, transportation and sale of bottled water, and the disposal of the associated waste, involves a significant amount of energy use and pollution.

### The bottles

As we noted above, most water bottles are made of polyethylene terephthalate (PET). PET is formed from terephthalic acid (TPA) and ethylene glycol (EG), both derived from crude oil. Catalysts are used to promote the chemical reaction, with the most common being antimony (see *Some potential health risks* above) but titanium, germanium, cobalt, manganese, magnesium or zinc can be used.<sup>19</sup> PET is used for water bottles as it is very lightweight, very clear and is largely unbreakable. Unfortunately, this means it takes several hundred years to disintegrate.

The bottles could be re-used (see *Re-usable bottles* below) or recycled. Unfortunately, the great majority of water bottles are simply thrown away. Although plastic water bottles are not the only source of plastic waste, they could be a significant proportion of the estimated half a millions tonnes of plastic we throw away every year.<sup>20</sup> Waste plastic is either incinerated (and who wants to live next to an incinerator?) or buried in landfill sites, which have ever less capacity to take our waste.

### Recycling

In 2004, only 35,000 tonnes of plastic bottles from households were recycled. The good news is that recycling rates seem to be increasing. Recent surveys<sup>21</sup> calculate that plastic bottle recycling rates increased to 13% of the total produced (to 67,000 tonnes in 2005) and are continuing to increase this year to around 17% of the plastic bottles in the household waste stream. This is probably due to the increasing numbers of local authorities that include plastic in their recycling services - either through comprehensive kerbside collections or via sites where people can take plastic. Only 14% of UK local authorities now have no facilities at all for recycling plastic.

The bad news is that more than 50% of recycled plastic, from industrial packaging and from household waste, is exported, using up yet more energy in transport. The main destination is China.<sup>22</sup> The plastic bottles are then usually made into polyester fibre, to be used in fleece clothing and filling for duvets.

Currently, very few plastic bottles used for water and soft drinks contain recycled plastic. A few brands have begun to include a recycled plastic content in their packaging - for example, Innocent Smoothies and Marks & Spencer own-brand drinks bottles. However, this remains the exception rather than the rule, so plastic for recycling continues to be transported and used thousands of miles away.

A new development is the use of biodegradable plastic for bottled waters, such as the Belu brand. Much has been made of this development, but in reality the plastic is very difficult to compost, requiring a specified

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19 International Life Sciences Institute (ILSI) Europe - *Packaging Materials report - 1. Polyethylene terephthalate (PET) for food packaging applications* - July 2000 - <http://europe.ilsa.org/publications/Report+Series/PackagingMaterials1.htm>

20 The Chartered Institution of Water and Environmental Management (CIWEM) - *Policy about Bottled Drinking Water* - November 2005 - [http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

21 Waste & Recycling Action Programme (WRAP) - *UK Plastic bottle recycling survey 2006* - March 2006 - [http://www.wrap.org.uk/applications/publications/publication\\_details.rm?id=698&publication=2768](http://www.wrap.org.uk/applications/publications/publication_details.rm?id=698&publication=2768)

22 Waste & Recycling Action Programme (WRAP) - *Environmental Benefits of Recycling* - May 2006 - [http://www.wrap.org.uk/applications/publications/publication\\_details.rm?id=698&publication=2838](http://www.wrap.org.uk/applications/publications/publication_details.rm?id=698&publication=2838)

23 Belu website, <http://www.belu.org/>, viewed October 2006

temperature (60 degrees centigrade), certain chemicals to be present in the composting environment, and the presence of microbes. Even the manufacturer acknowledges that this will be too challenging for the home composter, recommending that the bottles should be "commercially composted".<sup>23</sup> So this development currently remains of limited value for reducing plastic waste from water bottles.

### Water miles

The concept of food miles, and the environmental damage they cause, is now well established<sup>24</sup> but bottled water can also travel all around the world before we drink it. Arguably the most notorious example is Fiji bottled natural mineral water, which is promoted for its purity, while ignoring the more than 10,000 miles (16,000km)<sup>25</sup> it has travelled to reach us. Even bottled water from closer to home can be driven hundreds of miles before we get to drink it.

### Energy and water

Some bottled water is shipped or stored cold, so energy is used in refrigeration and, of course, energy is used in the factories that process and bottle the water. And an estimated two gallons of water are used, for every gallon of water purified to put into the bottle!<sup>26</sup>

Given all the above, it is not surprising that the Chartered Institution of Water and Environmental Management (CIWEM) considers that there is a need to ensure that the environmental effects of bottled water production are minimised and made clear to consumers in labelling.<sup>27</sup>

## 6. The price of image

So far we have seen that bottled water has no convincing health benefits (other than replacing sugary, additive-laden drinks in the diet), and in fact is associated with some health concerns. Worse, producing bottled water and transporting it to us uses considerable quantities of precious energy (thereby contributing to climate change) and generates prodigious quantities of plastic waste, very little of which is recycled.

This reality contrasts sharply with the glamorous image of water, which seems to have persuaded us to abandon common sense and simply open our wallets and purses. The Chartered Institution of Water and Environmental Management notes that the price of tap water is, on average, 500 times lower than that of bottled water.<sup>28</sup> Is it, perhaps, because tap water is so cheap that we do not value it? Or are there other reasons? We explore some of these in the next section.

### Bottled water for your pet?

A 2004 survey from the Food Commission revealed the absurd extent to which we now believe that bottled water is better than tap water. Not only can humans clock up their water miles, so can pets! These products are from the US, but have been seen on sale in pet shops in Scotland.



24 Department for Environment Food and Rural Affairs - *The Validity of Food Miles as an Indicator of Sustainable Development: Final report* - July 05

25 Dalmeny, K. (November 2004) Thirst for bottled water fuels food miles. Food Magazine

26 The Chartered Institution of Water and Environmental Management (CIWEM) - Policy about Bottled Drinking Water - November 2005 -The Chartered Institution of Water and Environmental Management (CIWEM) - [http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

27 The Chartered Institution of Water and Environmental Management (CIWEM) - Policy about Bottled Drinking Water - November 2005 -The Chartered Institution of Water and Environmental Management (CIWEM) - [http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

28 The Chartered Institution of Water and Environmental Management (CIWEM) - Policy about Bottled Drinking Water - November 2005 -The Chartered Institution of Water and Environmental Management (CIWEM) - [http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)



# The alternatives

## 7. How much water do we need to drink?

Whether from health professionals, or bottled or tap water companies, the message is always the same: most of us do not drink enough water. Perhaps predictably, some of the bottled water companies, and the organisations they have set up to give "expert" advice, suggest that we need to drink generous amounts of their product. However, it is surprisingly difficult to get a consistent answer to the question, "how much water should we be drinking for our health?" A Which? Magazine report in 2004<sup>29</sup> noted that, despite a ten month search requested by the American Journal of Physiology, Dr Heinz Valtin, of the Dartmouth Medical School in the USA, was unable to find any robust scientific evidence for the advice to drink "at least eight glasses of water a day".

The best estimates are likely to come from independent sources and, according to the most recent World Health Organisation (WHO) report on the subject,<sup>30</sup> our water needs depend on our age, gender, health, levels of physical activity, quality of our diet and many more factors. Their suggestions are shown in the table below.

### Volumes of water required for hydration - international reference value estimates, World Health Organisation, 2003<sup>31</sup>

	Female adult	Male adult	Children
<b>Average conditions</b>	2.2 litres per day	2.9 litres per day	1.0 litre per day
<b>Manual labour in high temperature</b>	4.5 litres per day	4.5 litres per day	4.5 litres per day
<b>Total needs in pregnancy/lactation</b>	4.8 litres per day (pregnancy); 3.3 litres per day (lactation)		

The WHO report also noted that this amount of water is not only ingested from plain water, but can also be provided by other beverages (see the box on page 10, A lovely cuppa?) and food. **In fact, approximately one third of our daily water intake can come from a healthy balanced diet that includes plenty of fruit and vegetables.**

The Food Standards Agency has translated this advice, for the usually cool UK climate, into a recommendation to drink roughly 1.2 litres (6 to 8 glasses) of fluid - not just water - every day, which allows for getting some additional fluid from the food we eat.<sup>32</sup>

As the kidneys of a healthy adult can process 15 litres of water a day, it is quite difficult for an adult to drink too much fluid. However, it is possible - it is known as water intoxication - but is more common among, for example, athletes who might drink too much over a short period to try to rehydrate themselves.

29 *Fluid for thought* - Which? Magazine, August 2004.

30 World Health Organisation - *Nutrients in drinking water - Protection of the human environment water, sanitation and health* - Geneva 2005

31 World Health Organisation - *Nutrients in drinking water - Protection of the human environment water, sanitation and health* - Geneva 2005

32 Food Standard Agency - Eat well, be well - *Drinking enough?* - [www.eatwell.gov.uk/healthydiet/nutritionessentials/drinks/drinkingenough/](http://www.eatwell.gov.uk/healthydiet/nutritionessentials/drinks/drinkingenough/)

## A lovely cuppa?

Most people love their cup of tea or coffee, and they do contribute to most people's water intake throughout the day. Caffeinated drinks such as tea, coffee and cola, can also act as mild diuretics, which means they make the body produce more urine - so you will also lose some of your fluid intake by going to the toilet more often. However, this depends on how much caffeine you have, how often you have it and how susceptible you are to this effect. The rule of thumb is that caffeinated drinks should not be your only source of fluid.

Tea and coffee also contain compounds, called polyphenols, which bind with iron making it harder for our bodies to absorb, so we should avoid drinking tea and coffee with meals or for 30 minutes after a meal. This is important particularly for young women, pregnant women and toddlers, who are most at risk of iron deficiency anaemia.<sup>33</sup>

## Water and children

Many organisations are working to improve the availability of water in schools - partly to discourage children from drinking too many sugary and/or additive-laden soft drinks - partly to hydrate children and help with concentration - and partly to help prevent enuresis.<sup>34</sup> It is important that plain water is easily available in schools in an acceptable form - i.e. not from dirty drinking fountains, or from water taps in the toilet areas. As well as installing drinking fountains or plumbed-in water coolers, some schools are also being encouraged to allow children to bring in their own re-usable bottles.

If you want to make sure your child has easy access to plain water at school, help and information is available from the Water is Cool in Schools campaign.<sup>35</sup>

## 8. Tap water

Two-thirds of our water in England and Wales comes from surface water - including reservoirs, lakes and rivers, with the rest coming from underground, such as aquifers (geological formations that store rainwater). Major cities are usually supplied from the larger volume surface waters, with ground water often supplying smaller populations, and some areas get their water from a mixture of sources.<sup>36</sup>

### ***The politics of water:***

*Some government agencies, such as the Food Standards Agency, now help their visitors to be more sustainable by using refillable bottles. But others use specially branded bottled water, including this example from the House of Commons.*

33 Food Standard Agency - Eat well, be well - *Water and soft drinks* -

<http://www.eatwell.gov.uk/healthydiet/nutritionessentials/drinks/waterandsoftdrinks>

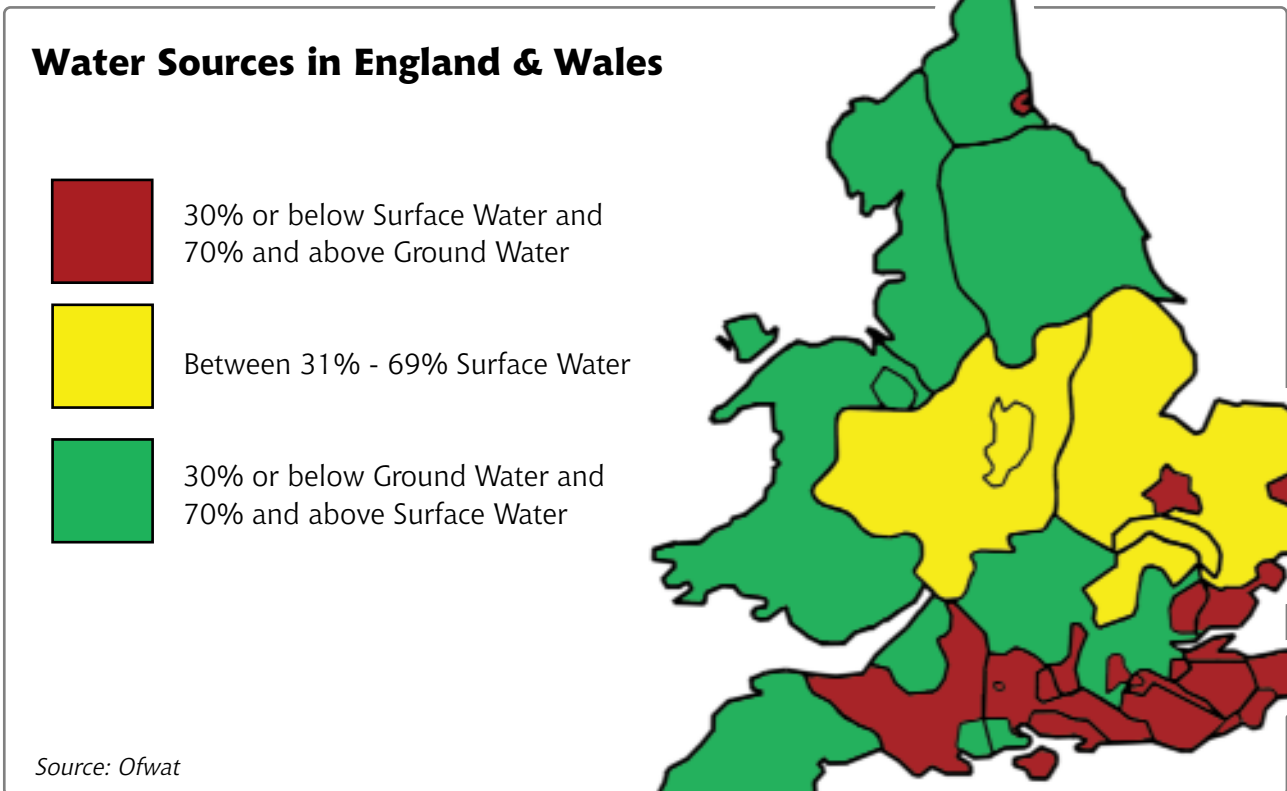
34 See Education and Resources for Improving Childhood Continence (ERIC) - <http://www.enuresis.org.uk/>. ERIC provides advice and information on nocturnal enuresis, or bedwetting as it is more commonly known.

35 <http://www.wateriscoolinschool.org.uk/>,

36 Ofwat - Facts and figures - May 2006 - Office of Water Services (Ofwat) - Water and regulation - Facts and figures - May 2006 - [Water\_regfacts\_figs Sewer.pdf]







## 9. Tap water and your health

Many people believe that, at best, tap water tastes unpleasant and, at worst, may even contain harmful contaminants. In fact, water for drinking is not taken from polluted sources but only from good quality surface and ground water. Even though the sources are "clean" the water is still treated, and extensively tested, to make sure it is safe to drink. The water in large lakes or storage reservoirs also undergoes a natural purification stage - factors such as sunlight help eliminate pathogens.<sup>37</sup> The next section outlines some of the main issues people raise about tap water and health.

### Chlorine

Chlorine is one of the most effective ways of disinfecting water, so it is added at water treatment plants to destroy any contaminants and minimise microbial growth in the distribution network. There are no health risks from the levels of chlorine in the public water supply but, unfortunately, some people are sensitive to the smell.

<sup>37</sup> Drinking Water Inspectorate (DWI) - Information Leaflet: Tap Water - where does it come from and how is it made safe to drink? - Last updated April 2003 - <http://www.dwi.gov.uk/consumer/faq/tapwater.htm>

## Lead

Lead in water is now very rare, with only 0.26% of tests giving results above the standard of 25 micrograms per litre.<sup>38</sup> Most of the lead piping has now been removed from the mains distribution system so the main source, if it is present, is usually lead pipework and fittings in older properties. Companies still do random testing for lead but, if you think you might have lead piping in your house, you can ask your water company to test it (see reference 44 on page 13 for how to find your water company).

## Endocrine disrupters

Endocrine disrupters are hormone-like chemicals that, at high doses, have been shown to induce female characteristics in male animals. Some people have expressed concern that, given the very high proportion of women taking contraceptive pills, the level of these chemicals excreted by women into the sewage system is likely to be very high, so these chemicals are finding their way back into the water supply and affecting men's health. This is as close to impossible as makes no difference, for the following reasons:

- even if the pills were excreted, unchanged, and recycled via tap water, the theoretical dose would be about one million times lower than the pharmacologically active dose;
- the actual dose is much lower because all sewage effluents are subject to intensive biological treatment before being discharged to watercourses;
- further biodegradation takes place in rivers and reservoirs;
- sophisticated treatment, such as with ozone and activated carbon, further reduces any chemical residues in drinking water to insignificant levels.<sup>39</sup>

All this testing and treatment is backed up by tough legal standards. Most of these are based on European laws, and on World Health Organisation guidelines, and include very wide safety margins. Some UK standards are even more stringent than these international ones. The regulations and standards are on the website of the Drinking Water Inspectorate, the independent agency that conducts tap water tests and ensures the water supply standards remain high.<sup>40</sup>

In June this year, for example, the Drinking Water Inspectorate (DWI) published the 2005 test results report about tap water in England and Wales. The results show a compliance rate of 99.96% with the European and national drinking water standards, an improvement on the 2004 results with a compliance figure of 99.94%. If you want to see the 2005 tests results for your region, the DWI website will give you all the details.<sup>41</sup>

## Is it fresh water?

One final point. Bottled water companies recently announced that it is safe to drink water that has been bottled up to two years ago.<sup>42</sup> You can be sure, however, that your tap water will have come much more recently from its original source than that!

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38 Chief Inspector Drinking Water Inspectorate - *Drinking Water 2005* report - June 2006  
<http://www.dwi.gov.uk/pubs/annrep05/contents.shtml>

39 Drinking Water Inspectorate (DWI) - Information Leaflet: *Tap Water - where does it come from and how is it made safe to drink?* - Last updated April 2003 - <http://www.dwi.gov.uk/consumer/faq/tapwater.htm>

## 10. Regulating the water companies

In England and Wales ten private companies provide both water and sewerage services, while 15 companies supply water, but not sewerage services. The companies providing water and sewerage service were created in 1989 by the privatisation of ten publicly owned water authorities, but the water supply companies have always been in the private sector, with many dating back to the Victorian era.

Scotland has a single water authority - Scottish Water - created in April 2002 from the three former public water companies, to provide water and sewerage services to the whole of Scotland. It is answerable to the Scottish Executive, but is structured and managed as a private company. Services in Northern Ireland remain in the public sector. The Northern Ireland Water Service is an Executive Agency within the Department for Regional Development, which was given responsibility for water and sewerage in 1996, following local government reorganisation.<sup>43</sup>

Water UK, the association for all the water and wastewater companies in the UK, has a map on its website where you can get the contact details of the company that provides services in your area.<sup>44</sup>

Because these companies, whether public or private, are monopolies they are very tightly regulated by two separate bodies; the Drinking Water Inspectorate is a technical regulator to make sure our water is high quality and safe to drink; the Office of Water Services (OFWAT) is an economic regulator that aims to ensure we get value for money. There is also a variety of watchdog and professional organisations that scrutinise the industry on our behalf and these are listed at the end of this report (see *Where to find out more*).



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40 Drinking Water Inspectorate (DWI) - Information Leaflet: *Tap Water - where does it come from and how is it made safe to drink?* - Last updated April 2003 - <http://www.dwi.gov.uk/consumer/faq/tapwater.htm>

41 <http://www.dwi.gov.uk/pubs/annrep05/contents.shtm> or <http://www.dwqr.org.uk> if you are in Scotland.

42 Tim Utton for The Daily Mail - *How old is your water?* - Last updated on 10th July 2003  
<http://www.dailymail.co.uk/pages/live/articles/health/thehealthnews>

43 Water UK - Water services in the UK - <http://www.water.org.uk/home/resources-and-links/waterfacts-2005/water-services-in-the-uk> - viewed on 25 September 2006

44 Water UK - Water Operator Links - <http://www.water.org.uk/home/resources-and-links/links/water-operators> - viewed on 25 September 2006

## 11. The environmental benefits of tap water

The best way to reduce the environmental damage caused by any sort of waste is to follow the rule "reduce, re-use, recycle". So although it is possible to recycle plastic water bottles (see *The environmental damage* above), and even re-use them (see *Re-usable bottles* below), by far the best option is not to have a bottle at all. On this measure, tap water easily wins the environmental battle with bottled water. There is no plastic waste to burn, bury or turn into other consumer goods, using energy.

Similarly, when it comes to transport, the Chartered Institution of Water and Environmental Management has pointed out the substantial fuel costs, and thousands of tonnes of harmful emissions involved in transferring over 22 million tonnes of bottled liquid from country to country every year.<sup>45</sup> In contrast, tap water is provided by a comparatively efficient infrastructure of underground pipes and plumbing. Although the system will use some energy, it will be significantly less than that involved in shipping and trucking bottles around the globe (containing water that has already been pumped and piped and purified), and so will help to reduce our impact on climate change.

## 12. Other options

Despite the tough regulation and rigorous testing showing the high quality and good safety record of our tap water, some people just do not like it. Is bottled water the only option for them?

### Filters

According to your personal preferences you might want to use one of various types of jug filter, or a growing range of filtration systems attached to your water supply.

#### *Jug filters*

The filter cartridge normally contains activated carbon, to remove elements such as chlorine, and an ion-exchange resin to reduce metals such as lead. Filters should remove the smell of chlorine and some people say the taste of the water is better. The jug may be glass or plastic with a capacity of one or two litres, and the jugs are portable, simple to use and economical.

However, if jug filters are not used properly, they can cause as many problems as they were designed to solve. To prevent the filter cartridge drying out (and therefore not working properly) it should always be in contact with water, and the cartridges need to be changed regularly, which is an additional - though not large - expense. To prevent a build up of bacteria, from frequent handling, the component parts of the jug, except the cartridge, should be washed regularly.

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<sup>45</sup> The Chartered Institution of Water and Environmental Management (CIWEM) - Policy about Bottled Drinking Water - November 2005  
[http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

### *Installed/plumbed-in systems*

These are usually installed under the kitchen sink and treat the water through a separate or specialist two-way tap. There are many different kinds of systems including sediment filters, activated carbon filters, temporary hardness filters, nitrate filters, ceramic filters and reverse osmosis systems.<sup>46</sup> Each has their pros and cons and all are more expensive than jug filters.

### Re-usable bottles

If you buy and drink a bottle of water, you can easily refill it with tap water instead of buying another one. This will save money, as well as be much better for the environment than throwing it away. Of course, as with anything we drink or eat from, sensible hygiene is in order, so clean your bottle regularly, just as you would your tea cup or coffee mug.

Some bottled water companies insist that their bottles are not designed to be reused. However, we are not aware of any independent research that shows any problem with refilling water bottles, provided sensible hygiene rules are followed.

Perhaps sensitive to the growing concern about the environmental damage caused by bottled water, some companies are taking a different approach. One, for example, has developed a system to bottle filtered tap water on site, in a designer glass bottle that can be re-used.<sup>47</sup>

### "Ethical" bottled waters

A few brands of bottled water in UK give part or all of their profits to charities involved in improving access to water in poor countries.<sup>48</sup> One of the United Nations Millennium Development Goals is to halve, by 2015, the proportion of people without sustainable access to safe drinking water.<sup>49</sup> Although the proportion of the population using safe drinking water in poor countries rose from 71% in 1990 to 79% in 2002,<sup>50</sup> progress is much too slow.

Other companies are investing in biodegradable bottles, made from corn starch, which are said to biodegrade back into soil in only ten weeks,<sup>51</sup> while others extract their water from under land that is being farmed organically.<sup>52</sup>

While these initiatives may be an improvement on "ordinary" bottled water, they still cannot match the environmental advantages of tap water.

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46 British Water - Drinking water treatment systems - [http://www.britishwater.co.uk/html/drinking\\_water.html#MainsWater](http://www.britishwater.co.uk/html/drinking_water.html#MainsWater) - viewed on 26 September 2006

47 The PURE Water Company <http://www.purewater.no/>

48 For instance: Belu, <http://www.belu.org/> or One, <http://www.we-are-one.org.uk/>

49 UN Millennium Development goals - <http://www.un.org/millenniumgoals/>

50 *The Millennium Development Goals Report* - May 2005 - United Nations Department of Public Information - DPI/2390 - 35M <http://unstats.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDGReport2006.pdf>

51 Belu - [www.belu.org/](http://www.belu.org/)

52 Different certifying bodies certify a few brands in UK. Llanllyr Spring Water (Organic Farmers and Growers) [www.llanllyrwater.com/](http://www.llanllyrwater.com/), Organic Highland Spring (Soil Association) [www.highlandspring.com/about\\_source.asp](http://www.highlandspring.com/about_source.asp)

### 13. Save water!

Perhaps the most important fact to emphasise is that fresh water is precious. Only 2.5% of the world's water is not salty and, of that, two-thirds is locked in icecaps and glaciers. Of the small amount that remains, 20% is in areas too remote for human access, and of the other 80%, about three-quarters comes at the "wrong" time and place - in monsoons and floods - so is not collected for use by people. So the fresh water we rely on is less than 0.08 of 1% of the total amount of water on the planet. This is frighteningly rare for such an essential natural resource.<sup>53</sup>

The drought that affected London and the South East of England in the summer of 2006, and predictions that such extremes of weather are becoming the norm, has made many of us think more seriously about the importance of our water supply, and what we could and should do to save water. Some of the organisations listed in *Where to find out more* at the end of this report can offer practical tips and advice about saving water, both at home and at work.

But when all is said and done, are you going to "bottle out" of your responsibility to the planet, and carry on drinking increasing quantities of bottled water?

We hope not.

#### **Well-travelled water:**

*Nowadays, we don't just wrap our water in plastic, we also transport it long distances around the planet before drinking it and throwing the bottle away. These examples, all bought in the UK, are from Canada, Fiji, Belgium and Turkey. The Canadian water has travelled 3,000 miles (5,000km) to reach UK consumers.*



53 World Water Commission 2000, quoted in Office of Water Service (OFWAT) - *Water and Regulation: Facts and Figures* - June 2005

# Where to find out more

## **British Soft Drink Association**

Address: 20-22 Stukeley Street, London WC2B 5LR.  
Phone: +44 (0) 20 7430 0356  
Fax: +44 (0) 20 7831 6014  
E-mail: [bsda@britishsoftdrinks.com](mailto:bsda@britishsoftdrinks.com)  
Website: <http://www.britishsoftdrinks.com/htm>

The British Soft Drinks Association (BSDA) represents UK producers of soft drinks, including bottled waters as well as carbonated drinks, still and dilutable drinks, and fruit juices. Membership at present includes around 90% of the manufacturers and franchisors of Britain's soft drinks.  
<http://www.britishsoftdrinks.com/htm/qa/BottledWater.htm>: page on bottled water

## **British Water**

Address: British Water, 1 Queen Anne's Gate, London, SW1H 9BT  
Phone: +44 (0) 20 7957 4554  
Fax: +44 (0) 20 7957 4565  
E-mail: [info@britishwater.co.uk](mailto:info@britishwater.co.uk)  
Website: [www.britishwater.co.uk](http://www.britishwater.co.uk)

British Water is a trade association representing the interests of the water and wastewater industry in the UK and overseas. British Water lobbies governments and regulators on behalf of its members and provides information on home and overseas water and wastewater markets - how much is being spent, by whom, where, when, how and on what.

## **Chartered Institution of Water and Environmental Management (CIWEM)**

Address: 15 John Street, London WC1N 2EB  
Phone: +44 (0) 20 7831 3110  
Fax: +44 (0) 20 7405 4967  
E-mail: [admin@ciwem.org](mailto:admin@ciwem.org)  
Website: <http://www.ciwem.org>

CIWEM is a professional and examining body for scientists, engineers, other environmental professionals, students and "those committed to the sustainable management and development of water and the environment". CIWEM supports action to inform and protect customers and its Position on Bottled Drinking Water identifies action for policy-makers.  
[http://www.ciwem.org/policy/policies/bottled\\_water.asp](http://www.ciwem.org/policy/policies/bottled_water.asp)

## **Chartered Institute of Environmental Health**

Address: Chadwick Court, 15 Hatfields, London SE1 8DJ (Head office)  
Phone: +44 (0) 20 7928 6006  
Fax: +44 (0) 20 7827 5862  
E-mail: [info@cieh.org](mailto:info@cieh.org)  
Website: <http://www.cieh.org>

The Chartered Institute of Environmental Health (CIEH) is a registered charity with over 10,500 members working in environmental and public health across England, Wales and Northern Ireland. In July 2006 it agreed a policy not only to stop buying bottled water for its own in-house events and meetings, (instead, providing fresh tap-water, iced or chilled) but also specify the same policy when using external venues.

### **Consumer Council for Water (CCWater)**

Each region has its own office. See:

<http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/customerservice>

CCWater represents water and sewerage consumers in England and Wales and took over from WaterVoice on 1 October 2005. It is independent of both the water industry and the regulator. For information on a wide range of subjects to do with water and sewerage service see:

[http://www2.watervoice.org.uk/aptrix/ofwat/publish.nsf/Content/navigation\\_wv\\_consumerzone\\_home\\_page](http://www2.watervoice.org.uk/aptrix/ofwat/publish.nsf/Content/navigation_wv_consumerzone_home_page)

### **Drinking Water Inspectorate (DWI)**

Address: Room M03, 55 Whitehall, London, SW1A 2EY

Phone: +44 (0) 20 7082 8024

Fax: +44 (0) 20 7082 8028

E-mail: [dwi.enquiries@defra.gsi.gov.uk](mailto:dwi.enquiries@defra.gsi.gov.uk)

Website: <http://www.dwi.gov.uk>

DWI regulates public water supplies in England and Wales. The Inspectorate was set up in 1990, after the water industry was privatized, to operate an independent body with staff experienced in all aspect of water supply. The DWI task is to monitor and check the safety of drinking water.

<http://www.dwi.gov.uk/consumer/faq/tapwater.htm#7>: frequently asked questions about tap water

### **Education and Resources for Improving Childhood Continence (ERIC)**

Address: 34 Old School House, Britannia Road, Kingswood, Bristol BS15 8DB

Phone: +44 (0) 0845 370 8008

Fax: +44 (0) 0117 960 0401

E-mail: [info@eric.org.uk](mailto:info@eric.org.uk)

Website: <http://www.enuresis.org.uk>

ERIC provides advice and information on nocturnal enuresis, or bedwetting as it is more commonly known.

### **Environment Agency**

Address: different for each region

Phone: +44 (0) 08708 506 506 (general enquiries)

E-mail: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk)

Website: <http://www.environment-agency.gov.uk>

The Agency is the leading public body for protecting and improving the environment in England and Wales. It aims to make sure that air, land and water are looked after by everyone in today's society, so that tomorrow's generations inherit a cleaner, healthier world.

[http://www.environment-agency.gov.uk/subjects/waterres/286587/287169/?lang=\\_e](http://www.environment-agency.gov.uk/subjects/waterres/286587/287169/?lang=_e)



### **Ethical Consumer magazine**

Address: Unit 21, 41 Old Birley Street, Manchester M15 5RF  
Phone: +44 (0) 161 226 2929  
Fax: +44 (0) 161 226 6277  
E-mail: [mail@ethicalconsumer.org](mailto:mail@ethicalconsumer.org)  
Website: <http://www.ethicalconsumer.org>

The magazine and website are produced by the Ethical Consumer Research Association, a workers' co-operative established in 1987 which is funded almost entirely by readers' subscriptions and by adverts from ethically vetted companies. The September/October 2006 issue has an article about bottled water.

### **Office of Water Service (OFWAT)**

Address: Centre City Tower, 7 Hill Street, Birmingham B5 4UA  
Phone: +44 (0) 121 625 1300 / 1373  
Fax: +44 (0) 121 625 1400  
E-mail: [enquiries@ofwat.gsi.gov.uk](mailto:enquiries@ofwat.gsi.gov.uk)  
Website: <http://www.ofwat.gov.uk>

OFWAT is the economic regulator for the water and sewerage industry in England and Wales. It is independent but works closely with the Department for Environment, Food and Rural Affairs, and the Welsh Assembly Government, as well as CCWater, DWI and the Environment Agency.

### **Waste and Resources Action Programme (WRAP) and RecycleNow**

Address: The Old Academy, 21 Horse Fair, Banbury, Oxon, OX16 0AH  
Phone: +44 (0) 1295 819 900  
Fax: +44 (0) 1295 819 911  
E-mail: [info@wrap.org.uk](mailto:info@wrap.org.uk)  
Website: <http://www.wrap.org.uk>

WRAP was established by government in 2001 as a not-for-profit company, and gained additional responsibilities in 2003 as a result of the Government's response to the review of waste policy undertaken in 2002 by the Prime Minister's Strategy Unit. The Recycle Now campaign is the product of WRAP's Communications and Awareness programme.

### **Water is Cool in School**

Address: 34 Old School House, Britannia Rd, Kingswood, Bristol, BS15 8DB  
Phone: +44 (0) 117 9603060  
Fax: +44 (0) 117 9600401  
E-mail: [info@eric.org.uk](mailto:info@eric.org.uk)  
Website: [www.wateriscoolinschool.org.uk](http://www.wateriscoolinschool.org.uk)  
[www.eric.org.uk](http://www.eric.org.uk)

The Water is Cool in School campaign aims to improve the quality of provision and access to fresh drinking water for children in UK primary and secondary schools. The main objectives of the campaign are to increase public awareness of the health benefits to children from drinking good levels of water during the school day, to improve access to fresh drinking water during the school day and to attain comprehensive legislation on drinking water in schools.

### **Water UK**

Address: 1 Queen Anne's Gate, London SW1H 9BT  
Phone: +44 (0) 20 7344 1844  
Fax: +44 (0) 20 7344 1866  
E-mail: <http://www.water.org.uk/home/contact-water-uk>  
Website: <http://www.water.org.uk>

Water UK is the industry association that represents all UK water and wastewater service suppliers at national and European level.

View water supply-only companies by region

<http://www.water.org.uk/home/resources-and-links/links/water-operators/supply-only>

View water and sewerage operators by region

<http://www.water.org.uk/home/resources-and-links/links/water-operators/sewerage-operators>

### **Waterwise**

Address: 1 Queen Anne's Gate, London, SW1H 9BT  
Phone: +44 (0) 20 7344 1838  
Website: [www.waterwise.org.uk](http://www.waterwise.org.uk)

Waterwise is a UK-wide Non-Government Organisation (NGO) governed by an independent board of academic, NGO, industry, government, and water company representatives. It aims to develop a model framework for sustained water efficiency for all uses of mains water and reverse the increase in water consumption per capita by 2010.

### **Which?**

Address: 2 Marylebone Road, London NW1 4DF  
Phone: +44 (0) 20 7770 7000  
Fax: +44 (0) 20 7770 7485  
E-mail: [which@which.co.uk](mailto:which@which.co.uk)  
Website: <http://www.which.co.uk>

Which? exists to tackle the issues that matter to all consumers. It campaigns to make sure consumers get treated fairly, and publishes magazines, books and websites to help people make the right choice. The August 2004 edition of Which? Magazine examined the bottled water industry.

### **World Wildlife Fund**

Address: Panda House, Weyside Park, Godalming, Surrey GU7 1XR  
Phone: +44 (0) 1483 426444 (main switchboard), +44 (0) 1483 426333  
(supporter and information enquiries)  
Fax: +44 (0) 1483 426409  
Website: <http://www.wwf.org.uk>

WWF is an independent conservation organisation based in more than 90 countries, working to addresses issues from the survival of species and habitats to climate change, sustainable business and environmental education. In April 2001 they commissioned, Catherine Ferrier to produce - Bottled water: understanding a social phenomenon [http://assets.panda.org/downloads/bottled\\_water.pdf](http://assets.panda.org/downloads/bottled_water.pdf)

## **The Water Guide**

Address: The Guides Network, Fubra Limited, The Cloisters, 4 Hillside Road,  
Aldershot, Hampshire GU11 3NB

E-mail: [support@theguidesnetwork.co.uk](mailto:support@theguidesnetwork.co.uk)

Website: <http://www.theguidesnetwork.co.uk>

The Water Guide is one of a series of websites, produced by researchers and writers. The water website provides up to date information about the UK water industry and all water companies operating in it. It also gives details on the background, services and contact details of all water companies, and information on how to reduce domestic water use.

See: [www.water-guide.org.uk](http://www.water-guide.org.uk)

## Useful books

Emily Arnold and Janet Larsen - Earth Policy Institute - *Bottled water: pouring resources down the drain* - 2 February 2006 - <http://www.earth-policy.org/Updates/2006/Update51.htm>

Erik D. Olson, J.D (Principal Author): With the Assistance of: Diane Poling, J.D. & Gina Solomon, M.D., M.P.H, *Bottled water: Pure drink or pure hype* - February 1999  
<http://www.nrdc.org/water/drinking/bw/bwinx.asp>

Polaris Institute, *Inside the bottle: mapping the bottled water industry*,  
<http://www.insidethebottle.org>

"Inside the Bottle" is a Polaris Institute project, based in the United States of America, designed to stimulate citizen awareness about the bottled water industry. This website has begun to map the bottled water locations of the industry's largest four companies - Coca-Cola (which has the Danone spring water brands in the US), Danone, Nestlé and Pepsi. Citizens in the U.S. are invited to contribute to this map by investigating and reporting how the industry operates in their community.

# Have you bottled it?

How drinking tap water can help save you and the planet

## About Sustain

**Sustain: The alliance for better food and farming** is a registered charity which advocates food and agriculture policies and practices that enhance the health and welfare of people and animals, improve the living and working environment, enrich society and culture, and promote equity. We represent around 100 national public interest organisations working at international, national, regional and local level.



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Web: [www.sustainweb.org](http://www.sustainweb.org)

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