



Dŵr Cymru
Welsh Water



Drinking water quality



Introduction

This leaflet shows the amounts of substances which are normally found in your drinking water and which may appear on a water quality analysis report.

The standards we measure against are set by the Government and are at a level to ensure that there is no risk to health. To assist you in understanding the water analysis report we have summarised the reasons for finding these substances in drinking water, and their importance. Substances that are recorded on the report appear in bold type in this leaflet. There are two measurements shown on the report - milligrammes per litre, (written as mg/l) and microgrammes per litre (written as µg/l). A milligramme per litre is the equivalent of two granules of sugar dissolved in a litre of water. A microgramme per litre can be represented as the two sugar granules dissolved in one thousand litres of water (About 4 bath-tubs full).

All water even spring water will contain minerals which can be detected by chemical analysis, such as calcium, magnesium and barium, which are associated with sulphate and alkalinity due to bicarbonates, and determine whether a water supply is hard or soft. A soft water allows soap to lather easily, and a hard water will form scale in kettles. Most of the water supplied in Wales is soft, and will have a low value for hardness. Borehole water tends to have higher levels of these minerals as this water is taken from deeper in the ground.

Other natural minerals which are found are sodium and potassium often associated with chloride (sodium chloride is common salt). One of the tests which can be carried out is to evaporate all the water from a sample to leave a dry residue of these natural elements. This is a measure of the quantity of minerals dissolved in the water, which occurs naturally as it passes through soil and rock, and is also measured as the conductivity of the water: the more minerals, the higher the value. Water can be described as acidic, alkaline or neutral, and this is measured as pH or hydrogen ion. A neutral pH is 7.0 and we aim to supply you with water which is between pH 6.5 and 9.5, although most are near neutral.

Dŵr Cymru Welsh Water does not have any supplies which are rich in natural fluoride, nor is it currently added to any of our water supplies. Levels in all our supplies are less than 0.1 milligrammes per litre.

The majority of our water supplies are taken from lakes, reservoirs and rivers. These waters contain natural organic substances and trace elements as well as minerals. For these waters we have to provide additional treatment before these waters enter our supply systems.

Nitrates, nitrite and ammonia in natural waters come from the processes of growth and decay of vegetation, the side-effects of normal agricultural activity, and

the waste products of animals. Amounts of these substances in the Company's water supplies are low. Phosphorus is another element which can come from natural or agricultural sources, and some may come from the breakdown of products such as detergents. It can also be added to water supplies to coat the pipework to decrease the amount of lead dissolving out of lead plumbing. Natural waters contain traces of many organic substances from soils and plants. These can be measured as carbon and nitrogen and are recorded as organic carbon or oxidisability. These substances often contribute to the colour of water supplies. Aluminium, iron, manganese, and copper which may occur in very small quantities in drinking water are often derived from soils and rocks, but may also arise from the water treatment processes, distribution mains or plumbing. These common metals are the subject of much interest and concern to our customers, but the amounts present in water supplies are considered to have no adverse effect on health. A separate fact-sheet is freely available upon request from your local area office which gives more information on each of these key minerals.

Boron is only usually found at very low levels in drinking water and is also considered to have little effect on health. It may come from natural sources or be found

when materials such as detergents are broken down. Of far greater concern to health are substances such as chromium, mercury, nickel, lead, cadmium, arsenic, cyanide, antimony and selenium. Waters which regularly contain significant amounts of these toxic substances are not used as water supplies. Lead however may be present in drinking water as a result of the water being in contact with lead plumbing. In the past, lead was quite widely used to make water pipes and this may be a problem since small amounts of lead in water may be damaging to health, particularly for children, and the policy in Britain is to reduce as far as possible the exposure to lead in our environment from all sources. The Company is working towards the removal of lead pipework from its systems and the overall reduction of lead levels to achieve the new standard of 10 ug/l by December 2013. We will be pleased to offer information and advice if you consider replacing the lead pipes in your home.

There may also be a number of organic substances present in drinking water which are found as a result of the use of man-made products, or industrial or agricultural activity. Oils and detergents that may be found in water supplies in trace amounts are reported as dissolved or emulsified hydrocarbons and surfactants.

Also reported are phenols and Benzene which can give rise to a strong odour and taste even when present in very small amounts. Common industrial solvents have also recently been included in water analyses and are reported as 1,2 Dichloroethene, tetrachloromethane, trichloroethene and tetrachloroethene; these too arise from commercial or industrial operations but are only occasionally found, at very low levels. Many complex organic substances are regularly analysed under the heading of pesticides (which also includes herbicides). Hundreds of pesticides are in use, but we report those which are in common use or known to be used, where they might affect a particular water supply. The maximum limit for any pesticide in drinking water is set at one tenth of one part per billion (0.1 ug/l). This is a vanishingly small amount, and in most cases the limits are not related to any known effects on health.

In the disinfection of water the use of chlorine may cause naturally occurring organic material to form a group of substances called trihalomethanes. These compounds are measured individually as trichloromethane, dichlorobromomethane, tribromomethane and dibromochloromethane.

Ozonation can also be used as a form of disinfection. Occasionally this can give rise to the formation of Bromate.

Similarly, a group of compounds called polycyclic aromatic hydrocarbons (PAH) coming from the coal tar linings of older iron water mains may be present in minute amounts in the water. An individual limit is set for one polycyclic aromatic hydrocarbon, benzo 3,4 pyrene, and a total limit applies to a further four constituents which include benzo 1, 12 perylene, benzo 3,4 fluoranthene, benzo 11, 12 fluoranthene, and 1,2,3-CD pyrene.

The Company is committed to providing a water which its customers find acceptable in both appearance and taste. Tests are regularly carried out to record the colour, turbidity (cloudiness), odour, taste and temperature of our water supplies. In the treatment of water any bacteria present are killed by disinfection (usually using chlorine). Specific tests are made to check that common bacteria known as coliforms are completely removed from water supplies. As treated waters are stored in reservoirs and pipes a few bacteria may regrow in the water and are recorded by colony counts. Regrowth is however discouraged by a small amount of chlorine which remains

in the water after the treatment process. These common bacteria in water have little if any effect on health, but are a valuable indicator of the very rare chance of any more serious infectious bacteria being present in the water supply. Waters are sometimes also examined for the presence of other indicator bacteria including Clostridia and Enterococci.

Cryptosporidium is another tiny micro organism found in man and many other animals. It is very resistant to adverse conditions in the environment and can survive for months in clean water or moist cool soils. Well operated treatment works which include filtration will reduce the risk of this organism passing into drinking water supplies. Daily monitoring is now undertaken at works judged to be at risk.

If having read this leaflet you feel that there is some aspect of your water quality which you would like to discuss, please contact your local area office where our staff will be happy to discuss this with you.

For advice on water services or in an emergency, please ring: Freephone 0800 052 0130