

# water treatment explained

Your mains water supply is treated using various treatment processes to remove any impurities from the raw water. The water that we supply is required to meet the standards laid down under the Water Supply (Water Quality) (Scotland) Regulations 2001.

**This factsheet provides you with information on:**

- different sources of raw water
- where we sample
- how we treat your water
- how to contact us

## different sources of raw water

The treatment process that we use depends upon the type of water source and the quality of the raw water available in a particular area.

Water from springs and boreholes is generally of a higher quality and may only need simple filtering followed by disinfection.

Water from upland sources such as lochs, reservoirs and streams, will normally require some sort of treatment process.

Water from lowland sources such as rivers, may require more extensive treatment as this is more likely to contain some pollutants.

Scottish Water will select the appropriate form of treatment based on the raw water quality data at each source.

We monitor the quality of our raw water sources to ensure their integrity and security. For more information on this process please see Scottish Water **Factsheet 1 your water explained**.

## where we sample

Water is sampled regularly at our treatment works, service reservoirs and at our customers' taps to monitor the quality of the drinking water. In addition to this, some water quality parameters are continuously monitored at major treatment works. Across Scotland over 350,000 laboratory tests are carried out on water samples each year for regulatory purposes. Many more samples are taken by staff for operational reasons (e.g. bursts, new mains, complaints). The percentage of all regulatory samples complying with the relevant standards in Scotland is over 99%.

## how we treat your water

As the treatment of your water depends upon its source, our treatment works may use one or more of the following processes:

### 1. storage

Surface water is stored in reservoirs to provide a continuous supply to meet demand throughout the year.

### 2. screening

Water is passed through mesh screens on leaving the reservoir or borehole. These screens remove debris, such as leaves, weeds and sticks which come in the raw water from the catchment area.

### 3. particle removal

**Coagulation** – Colloids and other impurities in the raw water need to be removed. Coagulants like alum (Aluminium Sulphate) are used to help bind the impurities together to form particles. This process is called solid-liquid separation, and requires precise dosing (measurement in milligrams per litre) and pH control along with good mixing to be effective.

**Flocculation** – By adding chemicals called polymers, the particles formed during the process of coagulation are further increased in size for effective removal. The choice of the polymers used may differ with the quality of the raw water.

**Sedimentation (also called Clarification)** – The particles created from the coagulation and flocculation processes then form themselves into a suspended mass of material called a sludge blanket. This blanket is removed and water is then allowed to settle in tanks. The water is then passed onto filters for further purification.

**Dissolved Air Flotation (DAF)** – This is a different type of clarification in which the impurities are floated to the surface, instead of being allowed to settle at the bottom. A mass of fine bubbles is created by saturating the water with air under high pressure, and these are then released and mixed with the flocculated raw water to help float the impurities to the surface. These impurities gradually collect to form a layer on the top which is skimmed at regular intervals into a separate channel, whilst the remaining water underneath, is allowed to pass onto filters.

**Rapid Gravity Filtration** – This process removes any remaining impurities through direct filtration using either sand or a mixture consisting of anthracite (coal) and sand.

Please note that in the absence of coagulation, raw water will pass through the sand filters untreated and impurities will not be removed.

**Slow Sand Filtration** – This process is used as an alternative to coagulation, clarification and rapid gravity filtration. With the help of gravity, the water passes slowly through a large sand filter. Tiny natural organisms in the filters break down any impurities by forming a layer at the top of the filter surface. The sand needs periodic skimming and washing. This type of process is not effective in removing colour in the water.

**Membranes** – Membrane filtration involves the filtering of raw water under very high pressure through prefabricated membranes. This process is more expensive, but the results give a better quality of water in situations where the raw water source is of a poorer quality.

**Sludge** – This is the material left over from the clarification and filtration processes. This is disposed of either to landfill, or by passing it directly to the sewer where it can be treated in a waste water treatment works.

### 4. treating taste and odour

Granular Activated Carbon, commonly called GAC, is used to absorb and remove many tastes and odours present in water supplies. This is an expensive process to maintain, and is more often used during the summer months when taste and odour problems are more likely to occur.

### 5. pH adjustment

pH is a scientific term used to describe the relative acidity or alkalinity of a substance. It is necessary for us to control the pH level of drinking water. If the water is too acidic it may corrode metal pipes, and if it is too alkaline it may cause deposits to form inside the pipes.

## 6. disinfection

Disinfection is vital to ensure that water-borne diseases are eliminated, and that the drinking water that we supply to you meets the Water Supply (Water Quality) (Scotland) Regulations 2001. Chlorine is predominantly used for disinfection either in gas or liquid form. However, chloramination (the addition of small quantities of ammonia mixed with chlorine) is also now being used in some areas of Scotland as it lasts longer in the supply system with less obvious taste and odour. Other less frequently used processes include the use of UV (ultra violet light) and Ozone for disinfection.

For more information please see Scottish Water **Factsheet 5 chlorine explained**, and Scottish Water **Factsheet 6 chloramination explained**.

## 7. lead in water

Phosphate may be added at our water treatment works to help prevent lead being absorbed from lead service pipes at customers' properties.

For more information please see Scottish Water **Factsheet 7 lead explained**.

## 8. fluoride in water

Scottish Water does not add fluoride to any water supply in Scotland. Low levels of fluoride are found naturally in some raw water supplies.

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## how to contact us

Details of water quality testing in your area can be obtained by contacting us and asking to speak to one of our specialists in the Public Health team.

If you require more information on our services, please contact us:

By phone on our **Customer Helpline 0845 601 8855**

On the web at **[www.scottishwater.co.uk](http://www.scottishwater.co.uk)**

Or in writing at **Scottish Water, PO Box 8855, Edinburgh, EH10 6YQ**

Alternative formats of this leaflet can be made available free of charge. Textphone users please call **0845 603 8855**. For information on Braille, large print, audio tapes and a variety of languages, please call **0845 606 8855**.

Please quote this reference code when contacting us: **SWFact WT2 08/08**

We record all calls for quality and training purposes.