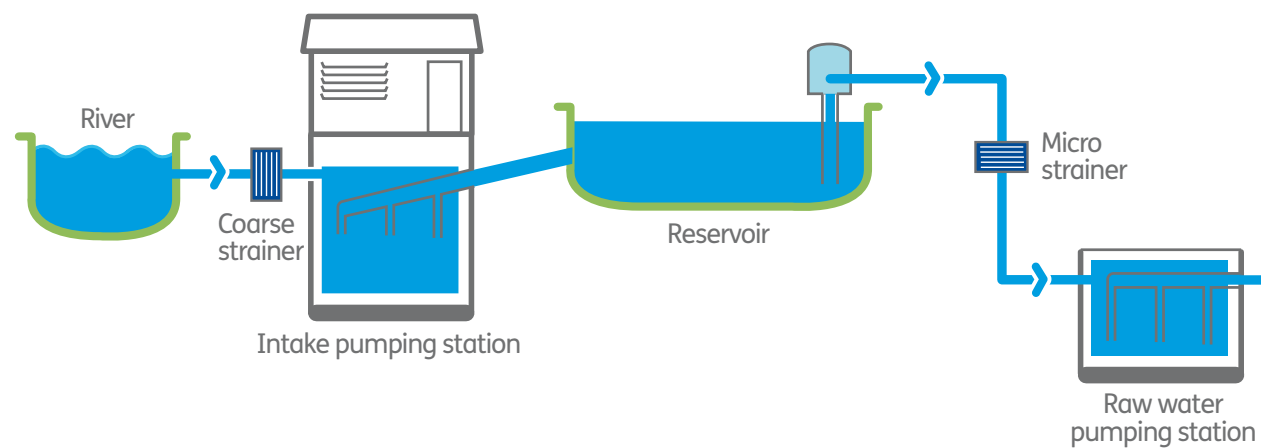


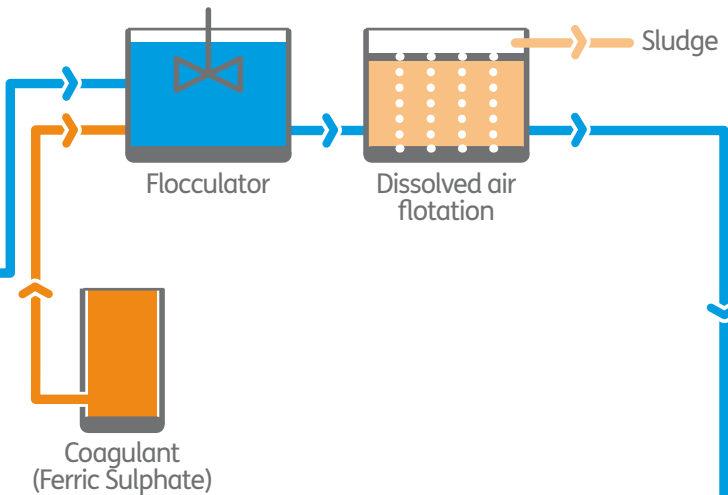
Making it clear: Water treatment



Abstraction



Clarification



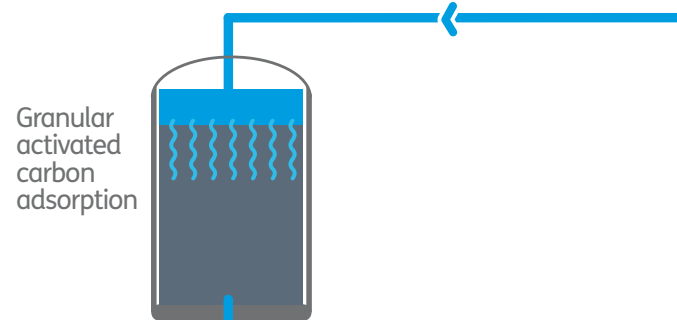
Water quality

Severn Trent Water is committed to providing reliable and high quality water supplies which fully meet all European and UK standards, known as The Water Supply (Water Quality) Regulations 2000 (Amendment) Regulations 2007. This is a vital contribution to protecting the health and well-being of the water communities it serves.

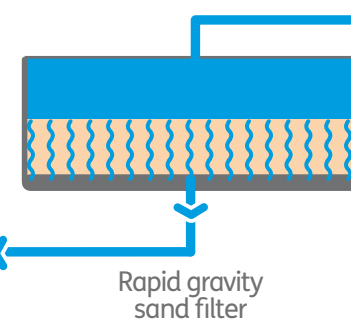
The primary responsibility for enforcing the standards and regulations lies with the Drinking Water Inspectorate (DWI). They independently assess the performance of every water company and report annually. Local authorities also have some responsibility for checking drinking water quality through their Environmental Health teams.

The standards cover chemicals, micro-organisms and aesthetic qualities such as colour, clarity and taste.

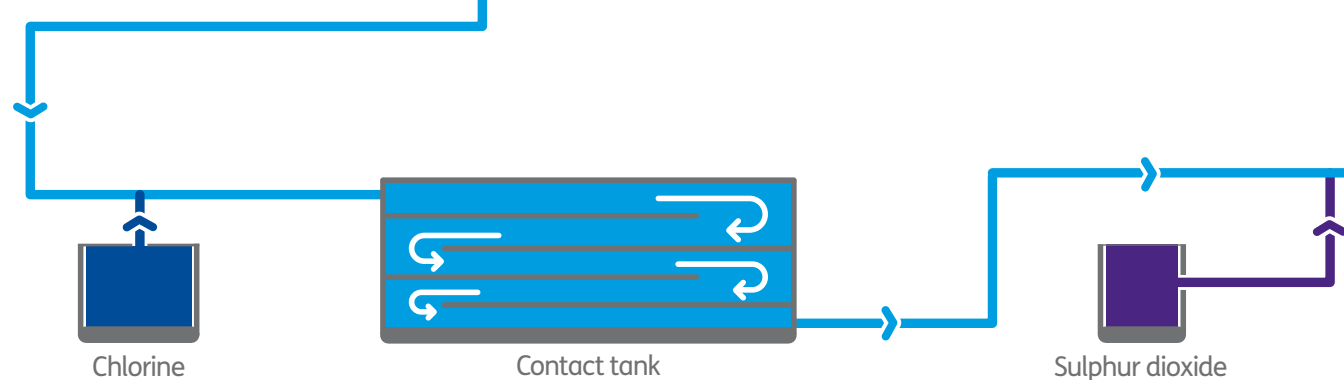
Granular Activated Carbon Adsorption



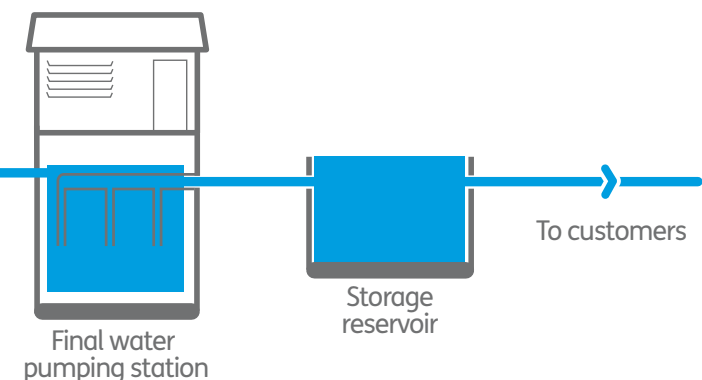
Filtration



Disinfection



Distribution



Monitoring water quality

To maintain its industry leading water quality compliance of 99.98%, Severn Trent Water monitors the quality of the drinking water it supplies. The company collects in excess of 500,000 samples annually which are expertly analysed in accredited laboratories. These samples are subjected to millions of separate tests. In addition to this there are 1,100 permanently installed continuous automatic analysers which monitor the water quality 24 hours per day, 365 days per year to ensure the quality of water supplied fully complies with the stringent standards laid down by the Drinking Water Inspectorate.

Severn Trent Water works hard to ensure that the quality of the water received by customers complies with the water quality standards, managing and maintaining 185 water treatment works and over 46,000km of water mains 24 hours a day.

Making it clear: Water treatment

Abstraction

The water supplied by Severn Trent Water comes from a variety of sources: boreholes (from aquifers), rivers and reservoirs. A third of drinking water supplies come from groundwater – which is the same as most bottled water. The majority of groundwater is sourced from sandstone aquifers in the West Midlands and Nottinghamshire. This is supplemented by smaller limestone aquifers in the Cotswolds and Derbyshire area.

Boreholes are usually drilled hundreds of metres into the ground to reach water which has filtered down through the many layers of rock over many years. Being so thoroughly and slowly filtered through the rock, groundwater usually needs only minimum treatment after being pumped to the surface. The treatment process for water abstracted from boreholes differs slightly from that for water abstracted from rivers and reservoirs.

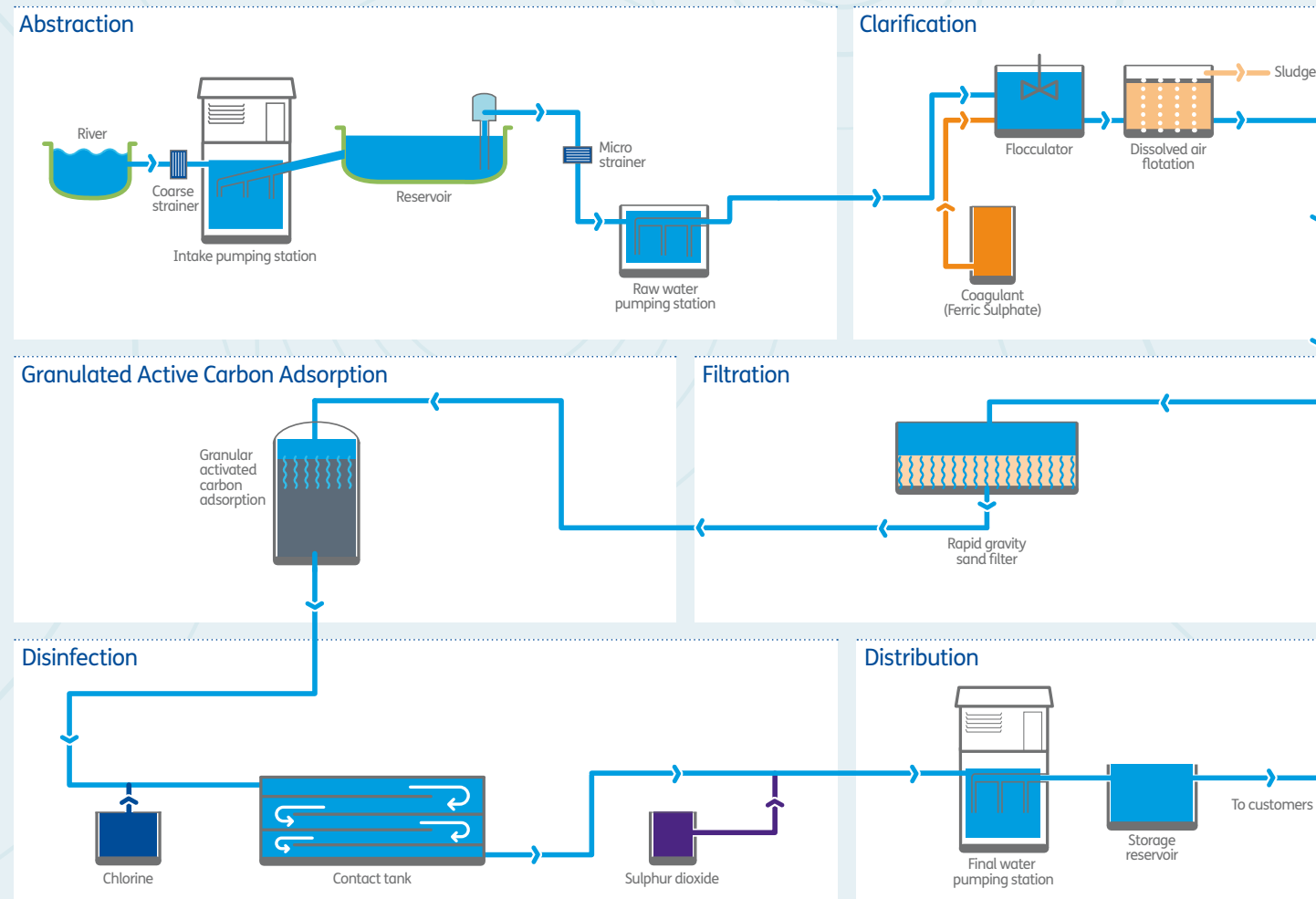
Two thirds of drinking water comes from rivers and reservoirs, which drain moorland, farmland and urban areas before reaching Severn Trent Water's surface water treatment works where it goes through a number of processes before being piped to customers. The first of these processes involves passing the raw water through coarse screens that remove any large items and living creatures from the water.

Clarification

The water is pumped into large flocculation tanks to be clarified. Here the water is mixed with a small dose of ferric sulphate, which causes the organic particles (floc) to stick together. This is called flocculation.

The water is then treated by dissolved air flotation. Here water, saturated with air, is added. Air bubbles then trap the floc and carry it to the surface. The floc forms a blanket which is scraped off and sent to a local sewage treatment works.

This clarifying process removes around 90% of the particulate matter from the water. It also removes algae and bacteria.



Disinfection

Chlorine is added to the water before it enters a contact tank, where disinfection occurs. Baffle walls are used to slow down the flow of water, to enable disinfection to take place. The residual chlorine level is carefully monitored throughout the system, and before the water leaves for distribution it is dosed with sulphur dioxide which reduces chlorine levels. Enough chlorine is left in the water to prevent bacterial growth in the distribution system.

The water leaving the process after disinfection is now completely clean and ready to drink.

Distribution

Drinking water is then pumped to a network of service reservoirs where it is stored to supply customer demand. The water then travels through pipes to customers' taps.

On-site laboratories constantly check the water for its quality, to make sure fresh, clean drinking water is always supplied to customers. The treatment process takes about three and a half hours.

Filtration

The clarified water is sent to large filtration tanks to remove the rest of the particulate matter.

These tanks use different sizes of sand and anthracite to filter any remaining particles from the water.

The tanks are drained and back-washed with air and water every 24-48 hours. This removes the solids that have built up.

Granular Activated Carbon (GAC) Adsorption

The water moves through tanks containing activated carbon granules. These grains of pure carbon remove any remaining chemicals such as pesticides from the water.

The carbon does this through a process called adsorption in which the chemicals are attracted to a honeycomb surface by electrochemical processes.

Renewable energy produced from the power of water: Severn Trent Water currently has hydro turbines installed on four sites, producing around 1.7 MW, which is 3% of our self generated electricity from water. We are currently investigating further opportunities to harness hydro power from our reservoirs, our networks and rivers.

Severn Trent Water has a strong reputation for operating our sewage treatment sites to a high standard so as to provide direct environmental protection and improve the quality of our rivers. We are also committed to enhancing biodiversity and are providing safe havens for plants and wildlife on our sewage works. Not all of the land that we occupy is used directly for sewage treatment and, by careful management, we are able to leave areas relatively undisturbed for the benefit of local populations of birds and animals. Often we work in partnership with local environmental groups and we have had many successes in maximising the potential of our sites to support conservation and biodiversity in the areas surrounding them.