

# Briefing Paper

## The management of water supplies in England during the 2018 heatwave and preparations for 2019

### Introduction

Summer 2018 was the hottest summer in England since records began back in 1910. Rainfall across the whole of the country over the 3 months of May to July was only 54% of the long-term average, with even less falling in August – only 43% of the normal amount of rain for the month.

The long, hot, dry summer had a number of impacts, not least the substantial pressures put on water supplies.

It is the duty and responsibility of water companies to ensure that water supplies are managed carefully and responsibly, and to prepare for potential problems caused by extreme weather. Supplies of water were maintained despite a substantial and prolonged increase in demand for water, and without the need in England for hosepipe bans.

This document sets out the range of actions taken ahead of and during the summer to ensure customers got the water they needed, and the actions taken over the autumn and winter to prepare for 2019.

### Additional resources

Although demand for water normally increases in the summer, the heatwave of 2018 saw demand go up across England well above that level - in several areas demand rose by around 30%.

This meant extra water needed to be treated and pumped into the system. For example, at the peak of the heatwave Southern Water put an extra 100 million litres of water per day into the system above the normal summer increase in supply, Severn Trent Water and Yorkshire Water put in 300 million litres more than usual every day, and Thames Water added 450 million litres.

The fact that companies were successfully able to meet the substantial increase in demand reflected a number of issues; forward planning, operational interventions, and investment.

All water companies prepare for the possibility of a dry winter and spring. As an example, Severn Trent Water spent an extra £1m on raw water pumping in the winter, ensuring that storage was between 91–100% at the start of May 2018 and that it entered the year with its grid 20% higher than last year. Anglian Water and Yorkshire Water also benefitted from previous investment in their grids, allowing them to move water around their network to where it was needed most.

Bristol Water took action to conserve stored water from the end of May, including maximising abstraction from the Severn well before this would normally be triggered, to reduce pressure to use more sensitive resources in the Mendip Hills. The Southern Resilience Scheme was brought into supply in April, again reducing demand on the Mendip reservoirs.

## Operational interventions

During the heatwave water companies took a number of actions to increase water supply. This included bringing water sources online that had previously been out of service (such as in the Southern Water area) and accelerating capital work to bring back into operation sites which had been out of supply (South Staffordshire Water). United Utilities installed new pumping stations, pumping between reservoirs and prioritising maintenance of existing assets, and Thames Water started up a key desalination plant with support from Defra during the national CO2 shortage. Northumbrian Water reconfigured its networks to reduce reliance on specific water treatment works or sources.

Much of the potential impact of the hot summer was avoided due to ongoing high levels of investment by the water industry, which is currently running at around £8 billion per year. For instance, South West Water's investment in pump storage schemes to improve resilience has supported use of two of its three largest strategic reservoirs at Wimbleball and Colliford. Wessex Water's £228m water supply grid was commissioned earlier this year, allowing movement of water between Dorset and Wiltshire, helping to provide customers in sufficient water supplies.

## Contingency Plans

No hosepipe bans were introduced in England during summer 2018. All companies had officially-approved drought plans in place to help minimise the impact of dry weather.

Drought plans – which are triggers allowing escalated action to manage dry weather rather than something which occurs when there is what is generally regarded as a drought - were activated in 4 cases; Affinity Water's was in action since 2017, and United Utilities, Yorkshire Water and Severn Trent Water brought them into effect during the summer. This involved establishing drought teams within companies with executive oversight and regular engagement with Defra, the Environment Agency (EA) and the Drinking Water Inspectorate (DWI).

United Utilities applied for drought orders and permits to allow measures to be taken to augment water available for public water supply. The EA issued four drought permits to United Utilities and worked with the company on further applications to support the Integrated Resources Zone. United Utilities withdrew the Drought Order application for Ennerdale once it was full, and the drought permit application for Ullswater.

Severn Trent Water took a proactive approach in line with its Drought Action Plan to preserve raw water storage, including pre-emptively triggering a major incident response plan, spending an additional £1.3m on bottled water and putting an extra £2m into moving water around by tanker to top up strategic reservoirs. It also boosted its tanker fleet with 25 additional vehicles.

Yorkshire Water used its Grid system to move water from the north and east of its region to the south and west, in order to help protect reservoir stocks. Whilst this action in itself is not unusual, the extent of support being provided this year goes beyond previous needs and demonstrates

the flexibility of the Grid in responding to different dry weather or drought events.

Other companies acted in line with their drought plans even where the plans have not been activated, including establishing Drought Management Groups and Task Forces, with companies such as Bristol Water, Essex and Suffolk Water, and South West Water putting groups in place.

## Customer communication, water efficiency advice and support

The main issue facing most water companies was not the availability of water but the ability to get it to customers fast enough during a time of extraordinarily high demand. With customers using all the extra water during extended peak periods as fast as it could be treated and pumped into the system the potential problem was a drop in pressure in the pipes, meaning water wouldn't come out of customers' taps as fast as they would like it to.

To help manage this extra demand for water and alleviate any potential pressure issues, all water companies promoted water efficiency messages to their customers, with the specific ask to "please use water wisely". Companies more immediately affected by the hot weather took enhanced approaches involving:

- extensive use of company websites, social media, direct texts and letters, including the use of targeting. For instance, South West Water focussed on some key areas and used messaging for specific sectors, and South East Water aimed messaging at areas with poor pressure or with distribution issues. Competitions and challenges were promoted in various areas, including Thames Water's 10 litre challenge;
- significantly increased television, radio and media relations activity at local and

regional level, and across England - Anglian Water, Cambridge Water, Essex and Suffolk Water, Northumbrian Water, Severn Trent Water, Southern Water, South Staffordshire Water, Sutton and East Surrey Water, Thames Water, United Utilities and Yorkshire Water were all very active, as was the industry's trade body Water UK. There was an increase in the use of television, radio, digital and billboard advertising from Severn Trent Water, Southern Water, South West Water, Thames Water and United Utilities. Severn Trent Water spent around £1m on communications including advertising and sponsorship of the weather in Birmingham, which sees the highest usage in their area. United Utilities' activity included full page adverts in local and regional press titles, on radio and TV, as well as at major outdoor advertising sites in Liverpool and Manchester;

- community engagement and roadshows, such as those run by Anglian Water - targeting high demand and summer holiday peak areas; Southern Water - targeting higher risk areas, and including school visits; South Staffordshire Water - over 1000 customers engaged in 5 local towns, and using its recently-opened community hub in Wednesbury; South West Water - customers invited to sign the 'Water Wise' pledge; Thames Water - talking directly to large discretionary users such as golf courses and plant nurseries, as well as stakeholders such as National Trust and Network Rail, to manage water use; and United Utilities - over 15,000 customers engaged through roadshows at 18 locations;
- promotion of water saving devices and advice, such as the activity by Affinity Water which then saw demand for free devices rise in July by 175%, and Thames

Water, which ran free efficiency visits to homes and businesses in areas under pressure – which is estimated to have saved 5,000,000 litres per day;

- ensuring that customers were able to access appropriate information where they might have experience a change in water source due to operational management of resources, such as Yorkshire Water ensuring that call centre staff received bespoke technical training before additional Grid water was supplied into Sheffield.

## Tackling leakage

Summer usually sees more bursts on the water network as the ground dries and moves, causing cracks in pipes and joints. This year's unusually hot and dry weather has seen companies take extra action to find and fix leaks, through:

- more resources for leak detection, such as South West Water, United Utilities and Bristol Water, with increases of 25% and 60% respectively for the latter two; Southern Water has deployed a 140% increase in both find-and-fix resources compared with the same period in 2017;
- use of technology such as satellite imaging, drones, improved telemetry and acoustic loggers to find leaks. Severn Trent Water used some of these new techniques as part of an extra £14m spent by it to tackle leakage. Southern Water deployed 1600 acoustic loggers since the end of 2017 and Yorkshire Water had a substantial programme of installing acoustic telemetry units on its network this year;
- other approaches to improve leak detection, such as Southern Water changing its leakage detection strategy on larger volume leaks; United Utilities used sniffer dogs and satellite imaging

as part of a wide range of targeted trunk mains leakage surveys;

- increased activity to fix leaks, such as Thames Water, which repaired over 1000 leaks per week on average, and United Utilities, which fixed 750 leaks fixed per week on average, with over 80% completed within 3 days of being reported. There was also the deployment of extra repair teams in Affinity Water, South West Water, SES Water, Thames Water and Yorkshire Water areas - with United Utilities and Bristol Water doubling the number of teams deployed. Extended hours of operation and re-prioritisation of work took place in the Affinity Water, Essex and Suffolk Water and Northumbrian Water areas;
- help for customers in repairing leaks to their own pipes. Thames Water increased the scale and speed of customer leakage fixes, with around 150 fixed in a two-week period in July and visible leaks actioned within 24 hours. Southern Water has offered free supply pipe repairs since the end of 2017, worth over £2m. SES Water has a dedicated team working on the issue, and South West Water revised its customer leakage policy.

## Other steps

At the July meeting of National Drought Group chaired by the EA, the National Farmers' Union (NFU) asked the EA to consider a more flexible approach to trading of water licences to enable water companies to support farmers particularly during the critical period of August. Water companies were supportive of this and worked closely with farmers and the NFU. Severn Trent Water, South East Water, South West Water, and Yorkshire Water were all involved in helping farmers, as was United

Utilities which set up a dedicated team to support farmers:

- Anglian Water worked with the EA and farmers to support irrigation by temporarily reducing abstraction from the River Nene by 20,000,000 litres over 2 weeks in early July, while Southern Water discussed with the NFU the use of a borehole in the Western Rother for abstraction trading and potential additional release from Bewl reservoir.
- Some companies also looked at providing non-potable water for certain uses, such as Thames Water delivering potable water in food grade tankers, technically designated as non-potable and agreed with the Drinking Water Inspectorate, to golf courses, garden centres and country estates, and United Utilities providing it to farmers for livestock use.
- Water transfers also took place between companies to maintain supplies. While Affinity Water was supported by Thames Water and Anglian Water, it was able to extend its normal support for South East Water and facilitate new connections to support Thames Water; Severn Trent Water took additional supplies from Welsh Water and South Staffordshire Water, and held discussions with Anglian Water, United Utilities and Yorkshire Water about the potential for other transfers; Southern Water increased the transfer of water from Portsmouth Water, and held discussions with South East Water.

## Forward look to autumn and winter

Since the summer, water companies have continued to act individually and with others to ensure the risks to public supply are effectively managed, should the weather

remain significantly drier than normal this autumn and winter.

Action falls into three broad categories: planning ahead, tackling leakage and optimising asset availability. Examples of the measures being taken by companies – in some cases, shaped by their experiences of the “Beast from the East” in February/March 2018 and the hot dry spell in the summer – are set out in the following sections.

### 1. Planning, modelling and stress testing

Water companies are working with the EA to consider the impacts of the reasonable worst-case scenario and stress-testing against more extreme rainfall scenarios. Outputs of this modelling and stress-testing will inform decisions and provide early indications of the situations where intervention could be needed.

In the case of Thames Water, for example, it has enhanced its models for severe cold weather, incorporating data and learning from the impact of the “Beast from the East”. These updated models are available for winter 2018/19, allowing the company more accurately to forecast the impact on their assets and prepare resources especially out-of-hours and at weekends. Southern Water has also been implementing a new horizon scanning process to assess risks of extreme events, and to understand where customers are at risk of losing supply against hazardous events, as part of a wider programme to improve forecasting and early warning capability.

With the immediate risks to water resources focused on the South Pennines and Derwent area, Yorkshire Water, United Utilities and Severn Trent Water are continuing to liaise closely with their respective EA areas in order to ensure that emerging risks are identified and mitigated, for example through easing abstraction where possible,

additional works to increase flows and where necessary seeking Drought Permits to reduce compensation flows (the amount of water that is released from a reservoir to maintain a baseline flow in downstream rivers) or to maximise use of water from less-stressed sources thereby preserving reservoir stocks for longer.

The resilience of water resources in the South East of England will depend largely on how far groundwaters recharge over the winter. Early indications are that whilst the start of the recharge has been slow due to excessively dry soils (which reduces the rate at which water can soak through to aquifers), an average amount of winter rainfall will allow water companies in the South East to meet customers' needs without having to restrict their water use in the near future. By way of improving longer-term resilience water companies are working together at both a national and regional level to develop plans and frameworks to manage extreme droughts.

Southern Water carried out a mock River Test permit application exercise in collaboration with EA and others, so that if a drought order becomes necessary at some point the relevant applications will have been pre-prepared. Thames Water is also tracking the potential risks around the River Lea. Bristol Water is working closely with the EA to mitigate emerging risks to the Windford Brook.

## 2. Further action to tackle leakage

Cutting the amount of water lost through leakage is a top priority for all water companies. In addition to their medium and long-term strategies to reduce leakage, since the summer companies have continued to focus on increasing the rate at which leaks are found and repaired. For example:

- Thames Water report that it is currently fixing some 6000 leaks per month compared to 4000 per month under normal operating conditions;
- United Utilities has seen leakage repairs rise by an average of 155 per week, or 35%, compared with their original baseline plan for this year;
- South West Water increased funding for leak detection and repair above normal spend by £4m from June 2018. This took the form of extra find-and-fix resource that resulted in an increase in leak repairs each month since July;
- Severn Trent Water increased the penetration of acoustic loggers to provide a more rapid and accurate ability to locate leaks, as well as trialling satellite technology and other innovative approaches. Following the “Beast from the East”, the company assessed all of the 1.3million pipes in their network and identified ten individual large pipes that, if they suffered a burst, could cause a loss of supply of more than 24 hours: plans are now being developed to improve the resilience of these pipes.

At the same time as addressing leaks on their pipes, many are also working with customers to increase the ability to identify and remedy leaks on or in properties, which accounted for a significant proportion of the additional leakage caused by the “Beast from the East”. Severn Trent Water estimated in its freeze-thaw action plan that around 70% of the additional leakage during the freeze thaw was on customer's pipes. For example:

- Southern Water introduced in March 2018 a free supply pipe repair scheme that was maintained for the rest of the year and will be reviewed in light of future drought risk;

- Severn Trent Water is running engaging and educative customer campaigns on lagging, finding stop taps, reporting leaks and providing incentives to customer to protect pipes and providing support in the event of a burst;
- Wessex Water has significantly increased its 'find and fix' resources in March 2018 to manage recovery from the "Beast from the East" and these were increased further this summer to manage dry weather breakout;
- United Utilities uses high bill alerts for customers it thinks have a higher than normal bill. The company contacts them to let them know their usage has increased and say they may have a leak, or ask if they have had a change in circumstances;
- By this winter, Thames Water's models will incorporate the potential impact of cold weather on customers' pipes, as evidenced by data from the roll-out of their smart metering programme;
- Thames Water is continuing the successful Smarter Home Visit (SHV) and Smarter Business Visit (SBV) teams across the wider Thames Water region as part of an ongoing water efficiency programme. It has approximately 130 staff delivering SHVs and SBVs, engaging households and businesses in water saving visits and fitting devices and fixing wastage, delivering around 380 SBVs per month, 5,500 SHVs per month and 700 wastage fixes (e.g. leaky toilets) per month. Each bespoke water efficiency visit is reducing household water use by around 10% and saving thousands of litres of water per day for each business.

Companies are also running winter preparedness campaigns to ensure customers have information on how to

protect pipes during the cold weather, further helping to reduce leaks. For example:

- Wessex Water is developing a customer engagement programme that will offer support to households that experienced frozen pipes during the Beast from the East to facilitate winter preparedness and resilience;
- Companies are publishing their winter ready web pages offering advice to customer to protect their own homes – such as Severn Trent Water's Winter Ready, South Staffs and Cambridge Water 'Give your home a HUG' campaign or United Utilities' Get Winterwise;
- The water industry is continuing to work with the EA and key groups such as the agriculture sector (particularly on livestock water provision) and the non-household retail companies (particularly on promoting consistent messages and on winter preparedness);
- South West Water recently staged a workshop with non-household retail organisations whilst Yorkshire Water is holding an event in December to consider the response to severe weather with the aim of ensuring a consistent and timely interaction with both household and non-household customers.

### [3. Optimising sources and asset availability](#)

Companies are continuing to assess critical asset maintenance to ensure that facilities are available when needed. This may include deferring planned maintenance at key periods or developing new sources. For example:

- Thames Water has begun abstraction from North London Artificial Recharge

Scheme to reduce pressure on reservoir storage; following operation during the summer, the Beckton Desalination plant is undergoing maintenance to ensure that it will be able to reliably sustain prolonged usage in the event of an extended drought in 2019;

- United Utilities is reviewing its water production plans to enable reservoir refill under a number of scenarios. This will inform critical asset maintenance needs and the timing of any activity/outage requirements;
- In addition, United Utilities increased capacity in its West-East link main [WELM] to move up to 100 million litres of water a day between Merseyside and Greater Manchester, creating a hugely flexible system. In the summer of 2018 this proved invaluable to maintain supplies to customers and manage abstraction from key water resources. United Utilities noted that there will be the benefit of increasing the capacity of the WELM, which will be able to support movement of an additional 50 MI/day [50%] of water by early 2019;
- South West Water had early discussions about their shared reservoir with Wessex Water - Wimbleball - and starting pumped storage in November once licence conditions allowed it;
- Severn Trent Water has been working with the EA to remove historic sediment from river channels to increase the efficiency of diverting river flows into Ladybower Reservoir in Derbyshire;
- Bristol Water is conditioning their River Axe abstraction and pre-treatment works in preparation for abstraction by the end of 2018;
- Wessex Water has reviewed its planned outage programme and brought forward activity to start earlier in 2019 so that it is returned to service ahead of peak demands.

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