

## Appendix R

# South Staffs Water 2022 Drought Review

### Effects

In 2022, hot weather and high water demand put unusual stress on the water resources of England. South Staffs Water keenly felt this impact and saw very high demands across the West Midlands region. This put significant pressure on Blithfield Reservoir and the River Severn as they supply a large proportion of raw water to the South Staffs (SST) water supply area. Figure 1 below shows the exceptionally elevated demands that were seen in 2022 – values of 393 MI on 12 June and 407 MI on 17 July were record-breaking demand levels that have not been broken for at least 10 years. These uniquely strenuous conditions were seen across the country and contributed to the stress on our strategic water resources.

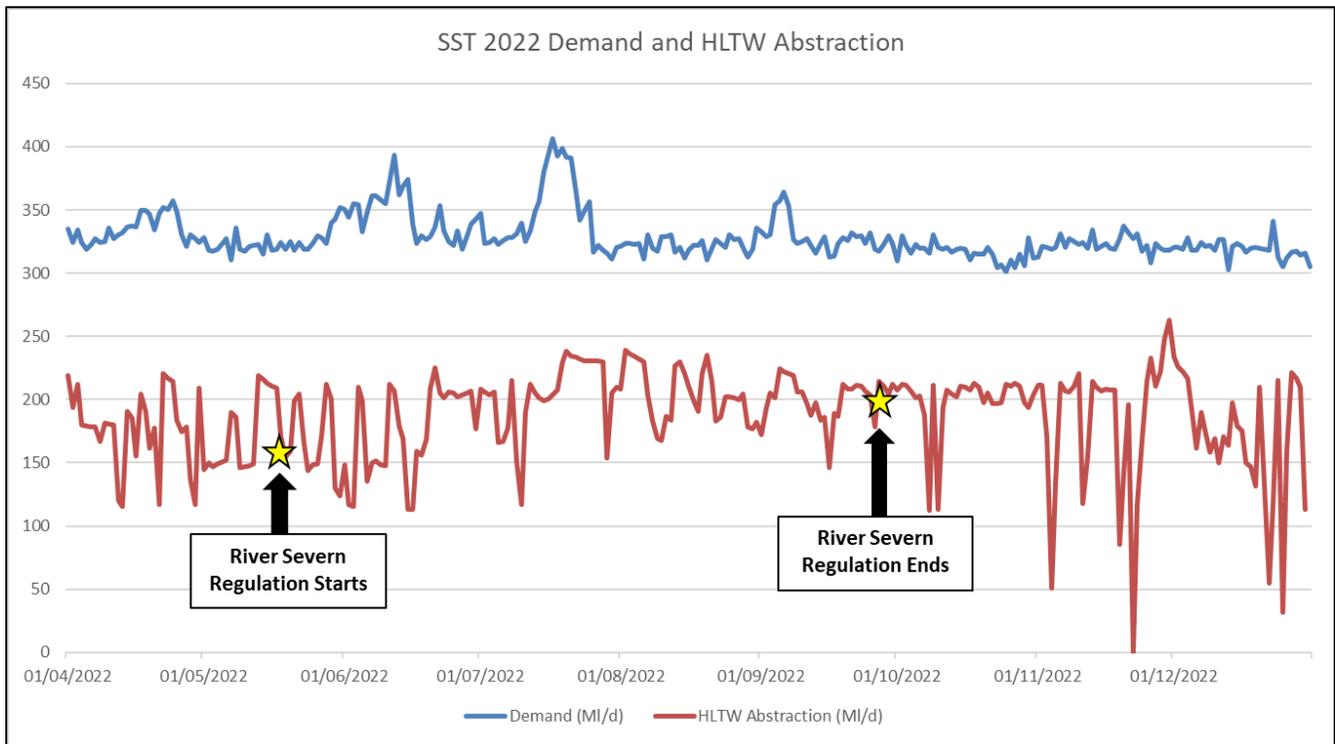


Figure 1: Total demand for the South Staffs region (blue) in 2022 against Hampton Loade Treatment Works abstraction (red) with river regulation.

The River Severn experienced an unusually high 114 days of river regulation from the Environment Agency. This regulation limited the output of Hampton Loade Treatment Works (HLTW, the majority supplier of water to SST) as maintaining flows in the Severn is critical to preserving the ecological health of the river and supplying a natural, sustainable flow along the entire river course. As a result, we had to gradually reduce the maximum potential output of HLTW; the Works are allocated a carryover volume that steadily diminishes over the regulation period – the longer regulation continues for the lower the output from Hampton Loade. Therefore, by having 114 days of regulation (compared to 78 days in 2018, the most recent year with a similar level of drought) our risk of sustainably supplying a large amount of water increased, especially from May to September – the period in which we saw the hottest weather and highest demand. This placed greater stress on Blithfield reservoir and our other surface and groundwater assets due to these limitations.

Parallel to Hampton Loade and the River Severn, Blithfield Reservoir, our major strategic raw water storage, was put under significant strain to make up for HLTW’s output shortfall as a result of river regulation and meet the increased demand. In support of Seedy Mill Treatment Works (SMTW, SST’s second biggest supplier of water), Blithfield was 42% full at its lowest during the 2022 drought. This was surpassed only in recent memory by 1995’s level of 35%. Combined with generally lower than average rainfall from March 2022 to February 2023 and an unexpectedly high freeze-thaw period in December, Blithfield has had a large and continuous burden placed on it to cope with the higher demands across the past year, necessitating careful management of it and Seedy Mill.

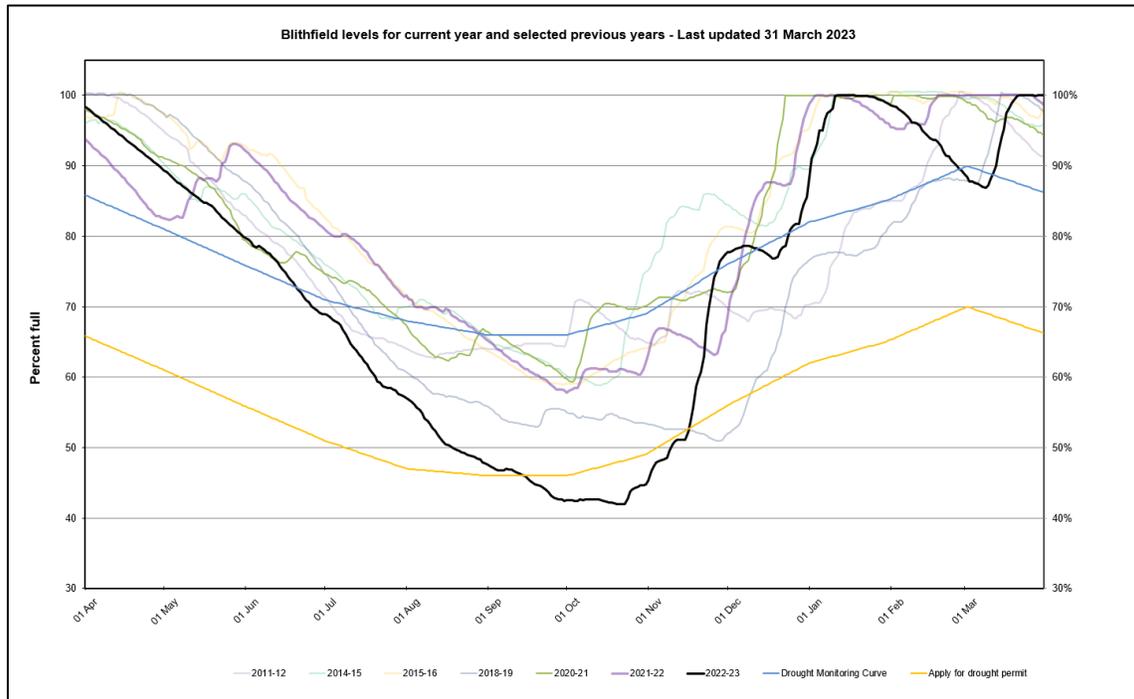


Figure 2: Blithfield Reservoir level in 2022-23 (black line) compared to other recent years.

## Response

South Staffs Water identified the significance of the 2022 drought early into its development. We took multiple serious measures to prepare for and combat the drought as effectively as possible. Strategic conservation meetings for Blithfield were initiated in June, before it crossed the Drought Monitoring Curve, to ensure early management of and preservation of levels in light of the reduced rainfall. This included weekly meetings to understand Blithfield's position, forecast its expected level and devise a rolling plan to enact any changes that could preserve and increase the reservoir's volume. Using the outputs of our conservation meetings, we increased our engagement with the EA to regularly update their understanding of the water resources situation and to explain our planned responses to the drought. This clearly laid out the steps we took during the drought and was a positive solution that we have incorporated into our business as usual (BAU) work so that ourselves and the Agency remain informed and unified on any drought developments.

In tandem with developing and enacting our strategic plans, we took vital steps to increase our water network's resilience throughout the 2022 drought. We put a temporary ban on all planned outage works from July to November, except for our Long Term Plan works at Hampton Loade and Seedy Mill. This increased the quantity of water that we had available across our supply region at a reliable rate and ensured that we could meet the unusual spikes in demand that occurred several times across the Summer period. In addition, we stepped up our unplanned outage response across the South Staffs region to more quickly address any unplanned outages at our sites. By using a RAG (Red-Amber-Green) system, we raised our outage response prioritisation as demands increased, generally moving into an Amber period in May/June and to Red in July/August when peak demands occurred. This process is part of our BAU and is vital to ensuring that we are resilient in our water supply by effectively stabilising our available water supply headroom. However, as a result of reviewing the 2022 drought, South Staffs Water has identified further improvements that can be made to reduce the severity of future droughts and high demands.

## Identified Improvements

As part of our response to the 2022 drought, we have examined both the supply and demand sides of the drought and the different factors that influenced them. We assembled a senior multi-disciplinary group with representatives from the direct technical teams that work in water supply and demand to undertake a full review, which also included the freeze thaw issues we experienced over winter. We identified several key areas to address from the drought, with the communications, water resources and Environment Agency communication aspects highlighted as the most important aspects to alter moving forward. These three areas were important parts of how we responded to the drought, however there are several potential adjustments which could be made to improve the reporting of, and the responses to, the drought.

## Communications

The greater distribution of information both around the business and to customers was seen as a limiting factor during the drought, with not enough pertinent data and advice circulated to those affected by it. This meant that our customers were not as aware of and engaged about the importance of the 2022 drought and were less aware of the changes that they could make to reduce their own water demand. A key challenge that we identified was the length of time it took to prepare water saving and advice messages both leading up to and during the drought. Proactively developing communication packages ahead of droughts and high demand periods will allow South Staffs to circulate relevant advice effectively and quickly about the current pressures on water resources and water saving tips to reduce demand. These will be available as convenient ‘on the shelf’ packages that can be rolled out to customers across our region, whether through website content or via emails, texts and letters.

However, before deploying these messages, we will use our existing H2Online customer community to discuss the effectiveness of our proposed communications, both in how relevant the messages are as well as the appropriateness of the delivery systems that we use (for example using more physical methods of communications rather than social media). A customer-supported modular system such as this with pre-prepared comms will enable us to adapt the information that is provided throughout the different stages of a drought – creating more engaged and educated customers who understand the effects and solutions of droughts.

In addition, we will look to connect more with our customers once a drought has ended. Similar to this report, we will address the recent drought and discuss what our responses were and what we will do in the future, along with any changes that will be made to our processes. Details about what our customers can do to improve their water efficiency shall be provided to educate them on how they can alter their water behaviour to reduce demand and save money on their bills. At the same time, we recognise that this is a two-way process and we will engage with our customers to understand their opinions on a drought and how it has affected them. These interactions allow us to develop our communications messages and make them more pertinent to our customers from all backgrounds to improve our BAU approach.



Maximising the breadth of our communications through different sources of information is a challenge that we are seeking to address. While this is in the same vein as our ‘on the shelf’ comms packages, we understand that the way we connect with our customers is not a static relationship and is important throughout the year, regardless of whether high demands and a drought are occurring or not. South

Staffs Water will be exploring the capabilities of using DAB radio advertising, local media engagement, and newspaper articles and adverts to enhance the ways in which we spread our messages to our customers. We are also seeking to work with local parish councils in our supply zone as they could help to disseminate information at a much larger local scale given their enhanced connection with our customers. All of these different channels of communication are intended to create an educated customer base that is well informed about our water plans and situation, as well as how they can help to reduce their own water demand throughout the year.

To augment the effectiveness of our customer communications we are looking to work with third parties to show and explain how droughts affect them. We intend to work with farmers in our region to show how the effects of lower levels of water and rainfall on their crops and animals alter their ability to produce vital goods and produce. Additionally, revealing the ecological damage that droughts and high demands have by working with the Environment Agency will demonstrate another facet of the damage that a lack of water can cause. We propose to create videos and podcasts that we share with our customers via our website and social media. These opportunities to collaborate with other significant water users will help our customers to visualise the real impacts of drought both on an economic and environmental scale, while also highlighting how relevant stressed water resources are to the local area.

Overall, we understand that a greater level of communications with our customers is required to alleviate the stress that high water demand causes. We will improve the relevance and spread of our comms and create a variety of pre-prepared information ahead of periods of high demand. Alongside working with third parties who are also affected by high water use, we shall increase the awareness of our customers and their education about the causes, effects and responses to drought in order to reduce the demand on our water supply and to help them save money on their bills.

## Water Resources

Focusing on the perception of the South Staffs water resources situation during the 2022 drought was another limiting factor identified in our comprehensive review. We found that there was a lack of overall appreciation of the water supply and demand situation both internally and externally, through our employees and our customers. We also identified an additional scheme through our liaison with neighbouring water companies during the summer of 2022 that could improve our strategic water resources. We propose to explore these further to realise their full effectiveness in alleviating pressure on our supply to improve resilience.

Blithfield reservoir is our strategic raw water storage system in the South Staffs water supply zone. As alluded to earlier, and as detailed in Figure 2, Blithfield suffered from some very low water levels during 2022. Beyond rainfall, our main way of topping-up Blithfield is through the utilisation of the Nethertown pump-back scheme which pumps water directly from the River Blithe into the reservoir. We now aim to keep Blithfield's level above the drought monitoring curve for as long as the North Muskham Hands Off Flow permits through utilisation of this scheme. This will ensure that a greater amount of raw water is available earlier in the year to absorb the high demands and low rainfall that normally develop as the year progresses. This shall therefore place us in a more stable water resources position further into the year.

Another potential option to support Blithfield during droughts is the use of a potable infusion of water into the reservoir. Clean water would be pumped into the reservoir from Hampton Loade to top-up its level and ensure that a continuous supply of water. Whilst this option has been used in the past most notably in the dry weather in 2018, there are concerns with the potential environmental implications and South Staffs has already been exploring this option with the Environment Agency. In order to progress, it will require a trial to ensure we can monitor and measure the process and any potential implications. We are in the process of agreeing parameters for the trial which would be initiated when Blithfield is lower than 50% full. While we do hope that the level in Blithfield does not become this low, we are preparing now to initialise this pumping scheme when the reservoir is in a healthy position. Should Blithfield fall below the 50% margin, we aim to be able to start the trial immediately to demonstrate the effectiveness and validity of using potable infusions in the future to support during drought conditions.

Over the longer term, we are exploring the option of using treated effluent from Severn Trent Water to support Blithfield. This would be another method of supporting the reservoir's level beyond relying only on rainfall. We examined this option in 2022 and identified several potential locations to feasibly draw this water from, including a power station licence that would supply raw, clean water to Blithfield. Our discussions with the EA highlighted that this would not be a short-term option given the complexity of moving the water, ensuring that it was of good quality and understand the potential environmental implications. This solution would also only be viable in the winter to provide recovery for Blithfield – the new supply of water would unsustainably divert flows from other watercourses during the summer, impacting their natural flows. We are therefore exploring the potential of this option outside of summer peak periods, much as with the Nethertown pump-back scheme, to keep Blithfield as full as possible ahead of low rainfall and high demand periods. This set of options, available both over the short- and long-term as well as during different parts of the year, will aid the supply of Blithfield reservoir. This will in turn reduce the pressure on our other water supply assets, such as Hampton Loade and our groundwater boreholes, to increase the resilience of our water resources across the year.



*Blithfield Reservoir*

In partnership with improving our strategic water resources, we have examined the role that communicating our water supply situation plays in the narrative of a drought. The current Blithfield reservoir level is published weekly on the South Staffs Water website, along with a monthly view of our water resources situation. However, we have recognised that this does not go into enough detail about how this compares to historical levels nor the immediate impact that this could have on our levels of service and therefore our customers. We will consequently produce a more rigorous and complete picture of our water resources situation which will be colour-coded against historical average rates. This will be added more prominently to our website and will be tied-in with water-saving methods that our customers can follow to help reduce demand and their bills. In addition, we will also spread more information internally to our colleagues who work in areas of the business that are not directly aware of the water resource situation; for instance, the Blithfield reservoir level graph (Figure 2) shall be on display in our Walsall Head Office so that everyone is cognisant of the strategic situation. These two methods of information dispersal will educate both our colleagues and customers, improving their engagement with our water supply and demand, and raising the general awareness of our water resources situation not just in a drought but throughout the year.

Within the technical water supply side of South Staffs Water, there are frequent meetings to discuss the current water supply and demand situation and to devise solutions to improve our water resources. We have Summer Action Plan (SAP) meetings leading up to and during the summer and high demand periods, and separate drought plan meetings to respond to an identified drought. However, these two meeting sessions often include the same members and discuss similar topics. We will therefore combine the two meetings into the SAP to ensure that there is clarity and cohesiveness of plans and strategies. A stronger Communications and Water Resources presence in the SAP meetings will provide better representation for these areas. This will enable them to both feed into, and be aware of, the challenges

and thoughts of the other water supply and demand areas of the business, further increasing the internal awareness of our water situation.

The combination of addressing strategic water resources options and the greater spread of information about our water supply situation will lead to enhanced water resources management. We believe that developing these modifications to our strategic water resources processes as well as enhancing the level of information that we provide about them will become part of our BAU, helping our supply and demand both in and out of drought.

## **Communicating with the Environment Agency**

In the previous two sections we have recognised a need to communicate more effectively with our customers and colleagues through our Communications and Water Resources. However, we also appreciate that communicating with one of our main regulators, the Environment Agency, is crucial to ensuring that our plans are sensible and supported. Just as we are doing with our customers, we are sharing our water resources situation with the EA regularly. In 2022 we only did this as the water situation worsened and the drought increased. Instead, this year we have already begun sending weekly situation reports to the EA to explain our strategic position as well as any forecast changes that could affect our water supply and demand. We will also send increased levels of information as necessary should there be threats to our supply (e.g. if there are large unplanned site outages) and if we forecast high demands. This has immediately improved the transparency of our water resources position with the EA and will ensure that both parties are coordinated in their responses to any high demands and drought.

Further to this, as with our SAP and drought plan meetings, we have had several duplicated meetings between South Staffs and the EA. This has hampered efficiency as information was often being repeated on different meetings with similar people. We are now working together with the Agency to reduce these duplicated meetings and improve their relevance. For example, the aforementioned weekly situation reports are being sent to a wider group of EA staff so that more related teams are appraised of our water resources position; the EA have also committed to combining some meetings to avoid duplication so that relevant information and queries are not mired by repetition. These two simple changes will consequently improve the relationship between South Staffs Water and the Environment Agency by improving the level of communication about water resources. The closer alignment of both groups will allow for communications to customers to be more effective and pertinent as we can address any potential threats to the water environment and to customers' levels of service, whether in or out of a period of drought.

## Conclusion

Throughout our examination of the unusually high-demand 2022 drought, we have looked to understand both the positive actions that we took as well as the areas that could be developed further to improve our strategies and processes. We quickly decided to implement conservation meetings for Blithfield reservoir – our strategic raw water storage reservoir – when the first signs of drought began and carefully managed the level through actions such as operating the Nethertown pump-back scheme. We also halted all planned outages (except for the Long Term Plan works at Hampton Loade and Seedy Mill) and stepped up our unplanned outage response levels as the drought progressed, increasing our resilience throughout our water supply network. These actions were communicated to the Environment Agency weekly and we informed our customers each month about our water resources situation.

As part of our technical review, we found that there were improvements to be made in our communications, water resources, and Environment Agency communications areas as detailed below:

- We are targeting a greater level of customer engagement through quicker, pre-prepared communications around hot weather and high demands via a greater variety of message delivery methods.
- We will also work with third parties, such as farmers and the EA, to explain the direct economic and environmental impacts that a drought has, and the actions that customers can take to reduce their own water demand and bills.
- We identified additional water resources options that could be used to support Blithfield reservoir, both in the short- and long-term. We are continuing to work through these to identify their viability and ensure development quickly if this is the case.
- We will also improve how we illustrate our water resources situation, both internally to our colleagues and externally to our customers, to ensure that everyone in the South Staffs area is educated and engaged in water.
- We highlighted how we could improve our conversations with the EA, both in the water resources situation updates that we provide and in the water supply and drought meetings that we frequently have with them. Changing these two processes will enhance the awareness of our current water supply with the EA and align both groups' positions on the current water resources situation and outlook.

These options will all work together to reduce water demand, by creating an educated customer base, and improve supply resilience, by making more options available to support strategic water sources.