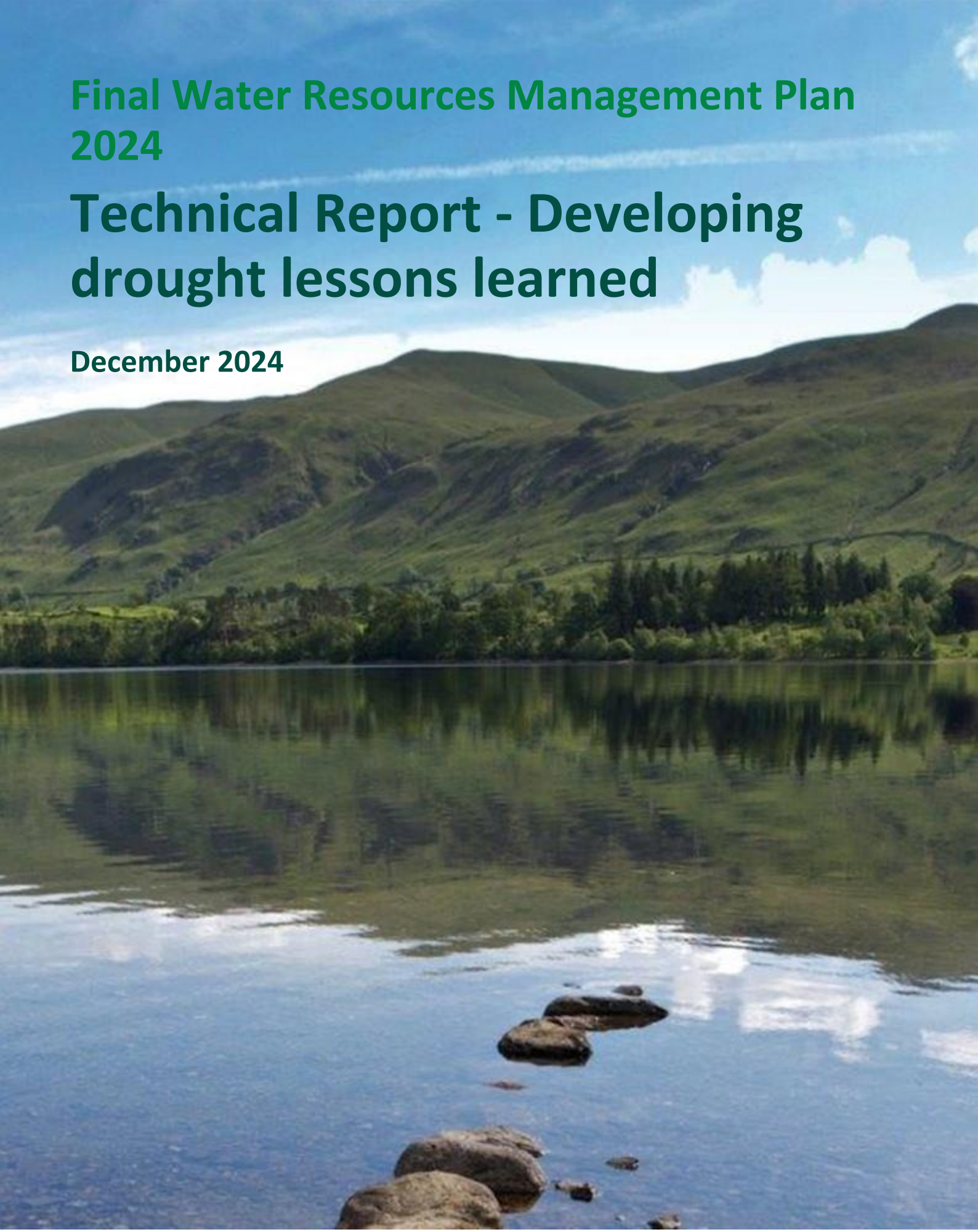
Final Water Resources Management Plan 2024

Technical Report - Developing drought lessons learned

December 2024



United Utilities

Water for the North West

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1. Introduction

During the later stages of developing our draft Water Resources Management Plan 2024, in summer 2022 many parts of the UK experienced a prolonged period of warm, dry weather. In some regions this developed into drought conditions, and several UK water companies found it necessary to implement water use restrictions and other drought measures during 2022. In our region, we experienced an exceptional shortage of rain and monitoring of conditions indicated that a drought was developing. We monitored conditions closely in line with our latest Drought Plan, however due to the timely occurrence of rainfall we did not need to implement any water use restrictions or drought orders or permits during 2022.

We believe it is good practice to review our experience of each dry weather event in order to capture any lessons learned and, if appropriate, update our plans and processes to reflect these. This could potentially include updates to our water resources models, changes to our Drought Plan and/or Water Resources Management Plan and updates to our incident management process. As a recent example, our latest update of the Drought Plan took account of lessons learned during a period of dry weather experienced in the summer of 2018, as set out in Appendix A of our Drought Plan 2022.

In line with the latest Environment Agency Water Resources Planning Guideline (March 2023), we have included in this technical report a brief summary of our experiences of the 2022 dry weather and lessons learned from this event.

2. Experience of developing drought conditions in 2022

In our annual review of the Water Resources Management Plan, we provide a summary of the weather conditions experienced during the reporting year and how these have influenced patterns of demand and reservoir storage. Details of the weather, demand and reservoir storage occurring during the summer of 2022 were provided in our annual review for the reporting year 2022/23 (1 April 2022 to 31 March 2023), which was published at the end of June 2023. In summary:

- During July and August 2022, our region received only 78% and 52% respectively, of the expected average rainfall for those months;
- Average maximum daily temperature for the summer period of April to September 2022 was 19.6^{o}c, which is 3.6^{o}c, or nearly 16%, above the long-term average for the period;
- Weekly regional demand was observed to rise up to 7% and 4% above the annual average in July and August respectively; and
- Reservoir storage in Haweswater Reservoir fell to around 40% by the end of September 2022; however during a period of above average rainfall in the autumn of 2022, storage recovered quickly to over 90% by the end of November.

During the developing situation, we monitored conditions closely and followed the steps set out in our Drought Plan as applicable. Our draft Drought Plan 2022, which was developed taking into account our earlier experiences of a prolonged period of dry weather in 2018, was published in May 2022, and therefore we were able to follow this updated plan. The Final Drought Plan 2022 was published during this period, in August 2022.

During the conditions experienced in the summer of 2022 we implemented the steps set out in our Drought Plan 2022, including the following:

- Our internal Executive Drought Management Group met weekly;
- Our internal Drought Coordination Group met weekly;
- The Environment Agency – United Utilities Water dry weather liaison group met weekly;
- An internal reminder to closely control compensation and prescribed flows was sent out on 30 June 2022;
- Where possible we utilised our operational pumping to support our regional sources;
- We stepped up our regular water efficiency messaging, using radio, print and social media communications to encourage customers to use water wisely;
- We increased our leakage activities and implemented several rezones to take pressure off the Pennines sources and increase support from the regional system; and
- We reviewed all planned outages, postponing these where appropriate to maximise our source availability during the dry weather.

The above activities are consistent with the 'Enhanced monitoring and operation' and Level 1 ('Increased risk from dry weather') stages of our Drought Plan.

From around September 2022 we experienced average or above average rainfall and therefore the dry weather did not ultimately develop into a drought in our region. As we did not experience a drought during 2022/23, and due to forward planning, optimisation of our system (raw water use and production planning), support of our customers to reduce their water consumption and lessons learned from previous dry weather events and embedded within our Drought Plan:

- We did not impose a temporary use ban;
- We did not apply for any drought orders or drought permits;
- We did not implement any temporary supply schemes, and no changes to our resource zone boundaries were required; and

- No changes to our bulk supply agreements were necessary.

As the weather changed and we began to see higher rainfall, the creation of a refill task team and the use of modelling enabled us to proficiently manage the refill at our most ‘at risk’ reservoirs across the region.

3. Lessons learned from 2022

After each dry weather or drought period we follow our own internal Post Incident Review process that is completed after any incident. Our response to drought conditions, as reflected in our latest Drought Plan update, is reviewed and improved on an ongoing basis but particularly in response to any dry weather or drought events that occur in our region.

Since experiencing a period of exceptionally dry and hot weather in 2018, we have invested significantly to convert drought resources, for example the Widnes boreholes, into supplies for routine use to improve regional storage in any period leading up to a drought. We have also revised the notification period for temporary use bans to ensure proper and reliable communication with customers during times when messages need to be at their clearest. Further to this we have undertaken additional research and piloted enhanced customer communication approaches. A comprehensive review of our water treatment works minimum and maximum flow capacities has helped us to verify data inputs to our water resources modelling and hydrological datasets to improve dry weather operational planning. In addition we have undertaken a critical review of drought permit sites focusing on priorities, risks and benefits. Internally, we have reviewed our incident task team structure and improved communication of the Drought Plan within the business to ensure preparedness for management of compensation-only reservoirs.

Since the embedment of the lessons learned from 2018, to ensure continuous improvement we have identified lessons learned from 2022. A further review of incident meetings, their contents, structure and data has helped to streamline the incident task teams and structure.

With the Pennines sources being at the greatest risk during the 2022 drought, we are exploring the use of locational-based drought triggers, much like those on Haweswater, and this will be reviewed as a part of the next drought plan submission. With the success of identifying risks with the use of modelling in 2022, the full embedment of operational modelling within the water system planning team is key to reducing risk in future drought.

With the work required before applying for drought permits and orders we are reviewing drought permits/orders for additional sites, where they may have been required had the dry weather event of 2022 continued for longer. Our drought plan details the most likely locations we may require a drought permit, but allows us to apply for drought permits outside of those detailed in the plan. If we were to apply and implement any drought permit not currently listed in the drought plan we would subsequently add these to the drought plan and would report this through our annual Water Resources Review. We will continue with preparations for supporting statements for drought permits/orders to ensure drought readiness at all times. In response to the 2022 event, we are undertaking additional reviews of risks associated with compensation-only reservoirs to consider whether environmental assessment reports are required. The aim is to complete as much as possible of such assessments in advance, to minimise time requirements should we need to apply for any such drought permits/orders during future events.

We are reviewing our reservoir deadwater assumptions at several sites across the North West where historic levels have previously defined the deadwater values. This work is currently ongoing and once completed will be shared with the Environment Agency. Any changes to deadwater are likely to be finalised after the publication of our Water Resources Management Plan 2024, therefore any such changes will be implemented as part of the annual review of the Water Resources Management Plan.

As outlined in our drought plan, outages are carefully managed throughout any dry weather incident. It should be noted that the dry weather event in 2022 presented an opportunity for some outages to go ahead, as the dry weather restrictions to protect the source were restricting output to allow the outage. Outages are carefully reviewed during dry weather incident meetings, and any ongoing outages were carefully managed to reduce any impact on recovery once it started raining.

Implications for the Water Resources Management Plan

As far as possible, we incorporate data from recent periods of dry, warm weather into our supply-demand analysis which supports our regular updates of our Water Resources Management Plan. As noted earlier in this document, however, the prolonged period of dry weather in the summer of 2022 occurred relatively late during the development of our draft Water Resources Management Plan 2024 (WRMP24). In line with changes to the Water Resources Planning Guidelines and the Environment Agency's response to these final guidelines, the cut off point for inclusion of data was the *"latest information up to 3 months before the publication of the plan".* Any further updates based on lessons learned in 2022 would be accounted for via our Drought Plan 2027, and subsequent WRMP 2029. Our plan has fully considered the implications and data from the 2018 dry weather period in the aspects detailed below:

- Review of Levels of Service;
- Changes to deployable output;
- Review of which resource zones require a dry year critical period to be assessed in addition to a dry year annual average planning scenario (this review was carried out for the draft WRMP24);
- Review of demand forecast assumptions, to incorporate the extent and duration of peak demands and to consider high demand resulting from all extreme weather - including heatwaves, as well as freeze-thaw events;
- Consideration of whether any additional transfer links may be required to improve connectivity and zone integrity;
- Review of outage allowance, to reflect any impacts/experience of outage management during recent dry weather events;
- Consideration of whether any other schemes may be required to improve the resilience of the supply system to dry weather events; and
- Updates to bulk supply agreements, as identified during dry weather.

Any necessary updates as outlined above will be implemented either through our annual review of the Water Resources Management Plan, or through the next update of the WRMP.

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