4.0 Evidence the Company has followed its Drought Plan

November 2022

CONTENTS

1 BACKGROUND

South West Water is applying for a drought permit under section 79A of the Water Resources Act 1991 ("WRA 1991") to make temporary amendments to abstraction licence 15/48/018/G/118/R01 as issued on 30 January 2018 ("the Licence") relating to abstraction from Park Lake, for the purposes of replenishing the storage levels at Colliford Reservoir

1.1 Executive Summary

The Colliford Water Resource Zone (**"WRZ"**) is currently in in Drought Level 2, with levels continuing to decline, we have executed our Drought Plan through Levels 0 and 1 by:

- Stepped up our close monitoring of drought situation in May 2022. Gold Drought Group meeting three times a week, exceeding the Drought Plan requirements.
- Instructed enhanced leakage response, which included free customer side repairs.
- Operational intervention across network and treatment estates which included pressure management, reduced flushing, treatment optimisation and source maximisation.
- Enhanced communications campaign across the Colliford WRZ.
- Commenced investigation of additional '*more-before 4*' supply side options (engineering schemes), including Park Lake and a new source at Hawks Tor both of which require a permit application.
- Implementation of engineering work, including the provision of a temporary water treatment works, to enable the Level 3 drought action at Porth/Rialton which will require a drought permit.
- Introduced temporary usage bans (**"TUBs"**) on 23 August 2022.
- Applied for the Level 1 drought permit application for Restormel WTW on 13 October 2022; granted on 31 October 2022.
- Applied for the Level 2 drought permit application for Stannon Lake on 27 October 2022.
- In accordance with our drought plan, within Level 2 and the ongoing decline in storage at Colliford Reservoir, we are beginning our preparation for Non-Essential Use Bans (**"NEUBs"**) for the Colliford WRZ.

Our drought management plan sets out actions to follow under levels of increasing severity. The drought management plan details '*more before 4*' supply-side drought actions that are considered to avoid implementation of Level 4 actions (Emergency Drought Orders) such as standpipes and rota cuts.

In following the drought management Level 1 and 2 drought permits have been applied for; significant engineering work commenced in August 2022 to enable the Level 3 drought source at Porth/Rialton, the application for this drought permit is anticipated November 2022.

Due to ongoing risk to supply presented by low storage volume at Colliford Reservoir for 2022 and 2023 all additional supply side measures are being investigated, it is envisaged that additional measures are required above those benefits delivered by Level 1-3

prescribed actions. This application represents the first of our '*more before 4*' supply-side drought options to improve winter recovery of Colliford Reservoir and is scaled to provide the maximum available benefit without further engineering upgrade (hence 14Mld within the application).

South West Water achieved its best reported, in year leakage performance in 2021, as we observed the dry weather lengthening, we advanced actions noted in our Drought Plan and significantly increased our leakage resources so that we could find and fix leaks faster, ensuring we were playing our part in protecting our water supplies.

We have also minimised our own water use and maximised the capacity in our water treatment works through our supply network. Our key objective has been to maintain a stable supply and demand balance, optimising available resources, and minimising the impact of outages on network storage and customer supplies into 2023.

We continue to monitor the situation in Colliford and all our WRZs very closely and will take all necessary actions needed to protect our customers' water supplies and the environment.

1.2 The drought permit application documents

This document is part of a suite of documents which form the application for the drought permit, as set out in Table 1. The structure and contents of the documents follows the requirements set out in **Appendix E** of the **EA guidance on drought permit and drought orders**, which was issued in 2019 and revised in 2021 (Environment Agency, 2021), with some adjustments to the sequence of documents and sections.

Table 1 - Document structure for drought permit application

Documents: Drought Permit Proposals		
1	1.1 1.2 1.3 Appendix 1 Appendix 2	Description of Proposals Draft Permit Drinking Water Services Report 2022 – Operations Supporting Evidence Park Lake Abstraction Licence National Security Notice
2	2.1 2.2	Statement of Reasons Case for Exceptional Shortage of Rain (ESoR)
3	3	Park Lake Drought Permit Environmental Impact Review
4	4 Appendix 1 Appendix 2	Evidence the Company has followed its Drought Plan Enhanced Media Campaign Leakage and pressure management
5	5	Actions taken to reduce demand and conserve supplies in line with Drought Plan
6	6 Appendix 1 Appendix 2	Consultation Process Formal Notice Email to Stakeholders

1.3 Objectives of this document

This document demonstrates that South West Water has managed its operations appropriately during the preparation and application for this Drought Permit.

South West Water has: -

1 Followed its Drought Plan, including its triggers and expected actions;

2 Engaged customers and enhanced water efficiency promotion;

3 Enhanced leakage reduction activity and effectively managed outage; and

4 Considered other options and risks.

2 OUR DROUGHT PLAN

2.1 South West Water's Drought Plan

South West Water published its Drought Plan in September 2022. The Drought Plan has been developed in discussion with the Environment Agency and has been approved by DEFRA.

South West Water has 4 Water Resource Zones ("**WRZs**"): Colliford, Roadford, Wimbleball and Bournemouth.

The Drought Plan divides drought actions into their distinct WRZs and provides updated information on the different drought options available.

2.1.1 Drought actions

The Drought Plan divides the possible drought actions into levels 1 – 4 and specifies which actions (supply and demand side) should be taken at each level for each WRZ.

Temporary Use Ban ("**TUB**") (Demand Side)

The Drought Plan contains detail on what the temporary use ban notice should include and includes example notices in the Appendices.

Drought Permit (Supply Side)

The Drought Plan suggests that preparations for the TUB and drought permit would take place simultaneously but that a TUB would be in place for at least 2 weeks before the date a drought permit is issued so the effect of a TUB can be measured.

Drought Order (Supply Side or Demand Side)

The Drought Plan includes information about Drought Orders. This sets out that all level 2 drought actions should be implemented before a Drought Order is made, which is also known as Non-Essential Use Ban ("**NEUB**").

The expected drought actions for Colliford WRZ as prescribed by the Drought Plan are set out in Section 2.2 below.

2.2 Expected actions within the Drought Plan

In the Drought Plan, Option CS2/E: Park Lake (Page A195) sets out that in circumstances of particularly low rainfall, a planned action is to increase daily abstraction by pumping from the Park Lake.

Park Lake, formerly Park Pit, is currently a currently active raw water source and is primarily groundwater fed. The application requests an increase in abstraction licence volumes requiring no further infrastructure changes, this results in a high level of confidence it will deliver the benefits associated of implementing this action.

Permanently installed pumps at Park Lake ordinarily pump water towards St Cleer WTW. During the summer and winter months the full licence is required for public water supply at St Cleer WTW. By increasing the license for Park Lake, from 8Mld to 14Mld, it will reduce the reliance on Colliford Reservoir by 2Mld and simultaneously provide an additional 4Mld for the winter recharge of Colliford Reservoir through existing infrastructure.

Table 2 below shows the Drought Plan actions in the Colliford WRZ.

Table 2 - Colliford WRZ drought action summary

Severity of the drought	Drought Severity Level	Drought return period (years)	Demand side actions	Supply side actions
Drought Plan	Level 1	> 1 in 500	• Enhanced media campaign • Increased leakage control • Enhanced pressure management • Network optimisation	
				Drought actions having a risk of minor environmental impacts: • Optimising sources • Outage • Restormel Annual Licence*
Drought Plan	Level 2	> 1 in 500	• Temporary use bans • Further enhanced media campaign • Further increased leakage control • Further enhanced pressure management • Further network optimisation	
				Drought actions having a risk of minor environmental impacts: • Stannon Lake*
Drought Plan	Level 3	>1 in 500	• Non-essential use bans	
				Drought Permits and ordinary Drought Orders having a risk of moderate environmental impact: • Porth Reservoir and Rialton Intake
			All possible actions to avoid emergency Drought Orders: • All demand-side drought actions listed in Appendix 4 for the Drought Plan	Drought Permits and ordinary Drought Orders having a risk of major environmental impact: • Drought Permits and Orders listed in Appendix 4
Emergency Plan	Level 4	>1 in 500	Emergency Drought Orders (such as standpipes)	

* Level 1 to 2 Drought Permits are proposed in Colliford WRZ, but these Drought Permits are unlikely to be needed unless the WRZ experiences an extreme drought (a drought with a 1 in 500-year return period or more severe).

** Where a Drought Permit is indicated, it may be determined that a Drought Order is require

3 HOW SOUTH WEST WATER HAS FOLLOWED THEIR DROUGHT PLAN

3.1 Water resource situation monitoring

We have been monitoring the water resources situation in the Colliford WRZ, following various metrics including rainfall and lake storage levels. Our monitoring of rainfall and storage levels indicating the progression of the drought in the region are presented in ***Document 2.1 Statement of Reasons (section 3)*** and ***Document 2.2 Case for Exceptional Shortage of Rain (ESoR)***.

3.2 Triggers

The Drought Plan divides the drought triggers into three different types: groundwater triggers, surface water triggers and demand triggers. Different types of triggers are appropriate for different water resources systems.

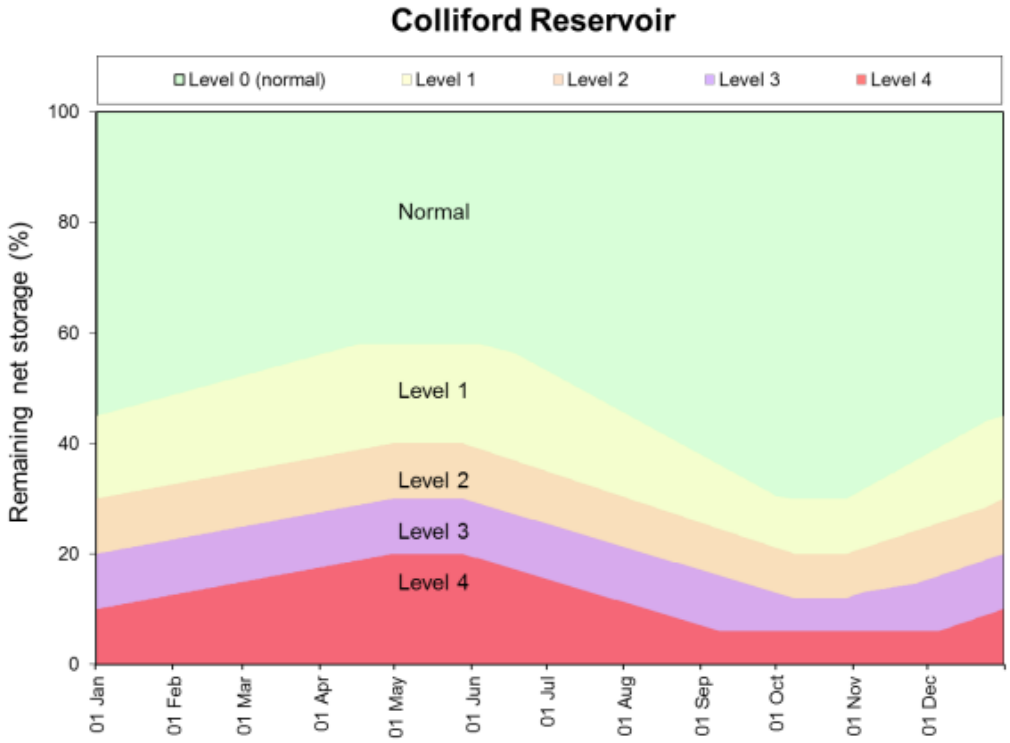
In the South West Water supply area, surface water abstraction dominates, with 90% of total abstraction being from rivers and reservoirs and with this abstraction being split roughly 50:50 between the two, although this ratio varies depending on the weather experienced in any particular year.

Because of this, in the South West Water supply area, drought triggers and drought management zones need to be set on reservoir storages. The triggers and drought management zones relate the storage in a reservoir to the time of year and the level of risk to water resource availability.

The drought management zones divide the storage of the strategic reservoirs into Levels 0 (normal), 1, 2, 3, and 4 and the storage of local reservoirs into Levels 0 (normal), 1, 2 and 3.

Figure 1 below shows the drought management zones for Colliford Reservoir.

Figure 1 - Drought management zones for Colliford Reservoir



The drought management zones relate to levels of service and define drought management actions that could be taken. Figure 2 below sets out a summary of the actions that would be taken as the drought severity increases.

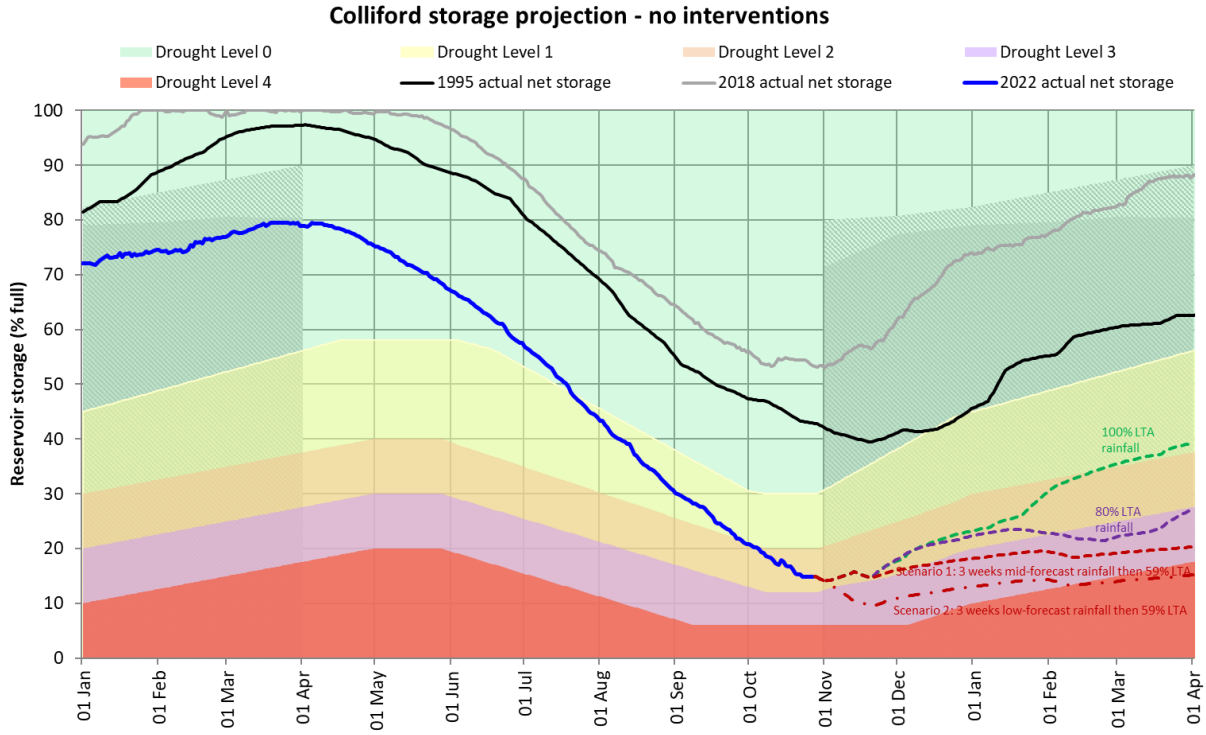
Figure 2 - Summary of drought management actions for each drought level

INCREASING DROUGHT SEVERITY ↓

Drought severity	Actions	
	Demand side	**Supply side**
LEVEL 1	Communications campaign Increased leakage control	Drought actions with minor environmental impacts (optimising sources, reducing outage)
LEVEL 2	Temporary use bans	Drought actions with minor environmental impacts
LEVEL 3	Non-essential use bans	Moderate environmental impact drought permit and ordinary drought orders
	All possible actions to avoid emergency drought orders	All possible actions including major environmental impact drought permits and orders

As Figure 3 below shows, Colliford Reservoir projection as on 28 October 2022. Colliford Reservoir is currently within Drought Level 2 and is projected to enter Drought Level 3 in November 2022 and under very extreme forecasts cross Drought Level 4 early 2023

Figure 3 – Colliford Storage Projections without interventions at as 28 October 2022



Under all scenarios the recovery of Colliford reservoir fails to achieve the 1 April target of 80%.

3.3 Alteration of operations

We have utilised all our strategic treated water network options to support the Colliford WRZ, reflecting 8 interventions which have been implemented this year.

Please see ***Document 1.3 Drinking Water Services Report 2022 – Operations Supporting Evidence*** which details how the company has altered operations during periods of high demands/low rainfall to minimise impacts on supply and demand.

3.4 Environmental mitigation

We have submitted the Environmental Impact Review (***Document 3 Park Lake drought Environmental Impact Review***) in respect of the drought permit application.

The monitoring and mitigation plan (***Document 3 Park Lake drought Environmental Impact Review***) submitted with the permit application focuses on the environmental monitoring and mitigation to be carried out during the period of the permit.

3.5 Communications and customer engagement

We recognise that customer engagement and communications activities form a significant part of our response to drought conditions. Please see Appendix 1 which sets out details of South West Water's customer engagement and enhanced media campaign, a brief summary of which is below.

To summarise the customer engagement to date:

- From May 2022, South West Water started encouraging customers to take part in the 5 litres challenge, our water efficiency campaign. The campaign was promoted across various channels such as:
    - Our website
    - Direct emails to customers
    - Advertorials
    - Outdoor advertising
    - Social Media
    - Community Events
    - Radio advertising
- We have offered free water-saving products for our customers.
- We have offered personal customers free leakly loo fixes as part of increased home audits
- Similarly, we have offered retail customers a “Find & Fix” service.
- From August 2022, the media campaign was changed to prompt urgent action from customers, focusing on reporting water updates, reducing leakage, and tips to save water immediately.
- The focus in September was informing customers of the reservoir levels and continung to encourage water-saving due to the previous eight months being exceptionally dry, despite rainfall in September.
- Throughout October we are increasing our reach and frequency of communication given the increasing severity of our storage position.

3.6 Reduction in company use of water

In addition to efforts to reduce customer demand and leakage, South West Water have also reduced operational demand for water.

3.6.1 Distribution Operational Maintenance ("DOMS")

All water intensive network tasks have been suspended regionally. Most notable is the suspension of potable mains cleaning tasks (DOMS flushing). The process requires the acceleration of pipe flow velocity to generate a scouring energy at pipe/water interface. This effectively shears off settled/loosely bonded materials. The velocity increase is

achieved by generating a measured discharge of water from washout and fire hydrants. Flows are calculated based on the pipe diameter and can be as much as 1500lpm.

3.6.2 Reducing treatment works losses

Our Drought Plan states:

South West Water is fortunate that most of its treatment works experience very low works losses (or process losses) because of previous investments and improvements in site operation. This includes the re-use of backwash water which is now a common feature of South West Water's operations. However, during times of drought, South West Water looks at opportunities to reduce losses further if feasible. There is currently a programme in place to identify and signal which treatment works have an above average loss of water and this allows South West Water to target sites particularly if it identifies deterioration in performance during droughts.

During winter 21/22 South West Waters engineering maintenance team carried out a review of all WTW losses and subsequent remedial works. At Restormel, Stithians, Drift and DeLank WTWs filter run times, works flow control, filter drain down times and sludge decant systems were optimised to allow increased production output. In addition, all filter outlet valves were inspected and replaced where defective or passing volumes of treated water, this water in turn was made available for the Colliford WRZ supply area c.1Mld.

At Stithians WTW we reduced sample flows, which run to waste after passing through online instruments and replaced traditional centrifugal pumps with more controllable peristaltic pumps, saving an estimated c.0.5Ml/d which in turn was made available for deployment.

3.6.3 Wastewater Services Usage

South West Water’s waste water service have a programme of works to identify where potable water savings can be made. A number of schemes have been implemented regionally whereby final effluent has been substituted for potable water for tasks such as washing down and chemical makeup.

3.6.4 Reduce Operational Water Use

As part of South West Water's corporate ESG commitments, Drinking Water Services (DWS) have been allocated a target of 2 Mld from an overall corporate target of 5.7 Mld; reductions are focused on process losses with a package of works to ensure the integrity of process valves linked to the Site MOT programme. South West Water has to date recorded 1Ml of saving attributed to the replacement of filter outlet valves at WTW across the region.

3.7 Leakage and pressure management

Please see Appendix 2 for a detailed breakdown of the leakage and pressure management work carried out by South West Water.

3.8 Outage management

South West Water has managed a lower unplanned outage than was included in its WRMP. Outage performance has been reported to the EA annually.

Planned outage has also been minimised across Colliford WRZ where possible and overall outage is reported in the tables/charts below from 1 November 2021.

3.8.1 Outage this year

Outage levels by source are in Table 3 for the period 1 November 2021 to 30 September August 2022.These are reported as annualised unavailable flow in Ml/d as defined in the guidance for outage reporting. These figures are broken down by category of outage.

Table 3 - Analysis of outage by type in Colliford (1 November 2021 to 30 September 2022)

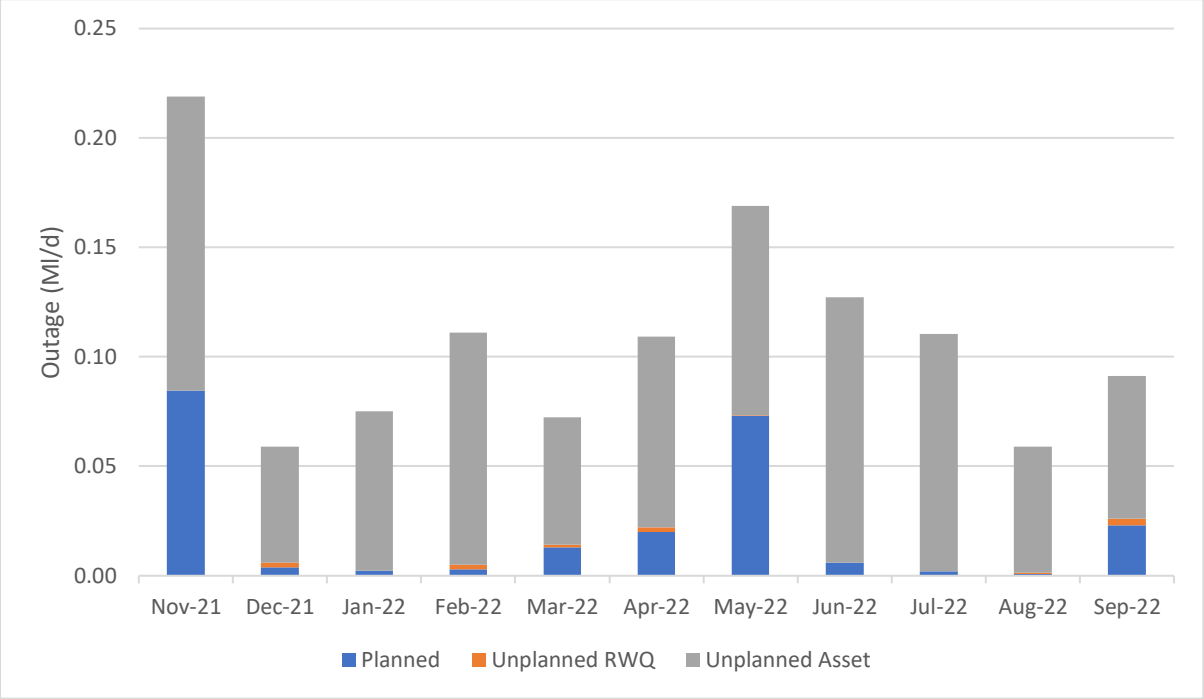
WTW	Planned	Unplanned Asset	Unplanned Raw Water Quality	Total
Colliford	**0.23**	**0.96**	**0.01**	**1.20**
Bastreet	0.01	0.01	0.00	0.02
College	0.01	0.02	0.00	0.02
De Lank	0.01	0.01	0.00	0.02
Drift	0.03	0.05	0.00	0.08
Lowermoor	0.02	0.49	0.00	0.51
Restormel	0.11	0.08	0.00	0.19
St Cleer	0.03	0.15	0.00	0.18
Stithians	0.01	0.08	0.00	0.09
Wendron	0.00	0.08	0.01	0.09

3.8.2 Outage during the drought

Overall outages amounted to around 0.55% of peak week production capacity since 1 November 2021. This has consisted of 0.11% planned and 0.44% unplanned.

Monthly unplanned outage has ranged from 0.06 – 0.13 Ml/d in the period since November 2021, as can be seen in the timeseries analysis, in figure 4.

Figure 4 - Colliford outages over time



The increase in planned outage in September enabled us to maintain capacity at Drift WTW.

3.8.3 Outage allowances in South West Water's plans

South West Water's yearly outage allowance for Colliford is 1.0 Ml/d, which equates to a year-to-date allowance of 0.5 Ml/d. South West Water's year-to-date position is in line with the allowance and generally showing a reducing trend since May 2022.

Table 4 - Yearly outage allowance for Colliford

	22/23 Outage allowance	Outage allowance ytd	22/23 Actual unplanned outage ytd
Colliford	1.0	0.5	0.5

The outage allowance figures in Table 4 are equivalent to unplanned outage as in the Water Resource Management Plan, it is assumed that planned outage will be carried out at a time when demand allows i.e., off-peak periods.

3.9 TUBs

On 23 August 2022, South West Water introduced TUB restrictions which applied in the Colliford WRZ and Tamar Lakes supply area of Cornwall and a small part of Devon.

It is difficult to prescribe the individual volumetric benefits to any individual demand side activities. The implementation of the TUBs has coincided with a change in the weather, lower temperatures, and more overcast days. Figure 5 below sets out the daily demand from the DMAs supplied by Colliford and illustrates the c.10% reduction seen since the temporary use ban was announced on the 15 August 2022. Figure 6 compares distribution input over 2022 with 2021 and 2017. The announcement of a TUB on 15 August 2022 is shown by the line marked "B" on figure 6. For context, previous studies estimate that a c7% reduction in demand can be achieved from TUBS and the data available suggests that South West Water also experienced a reduction of this order of magnitude.

Figure 5 - Daily demand for Colliford WRZ since introduction of TUBS on 15 August 2022

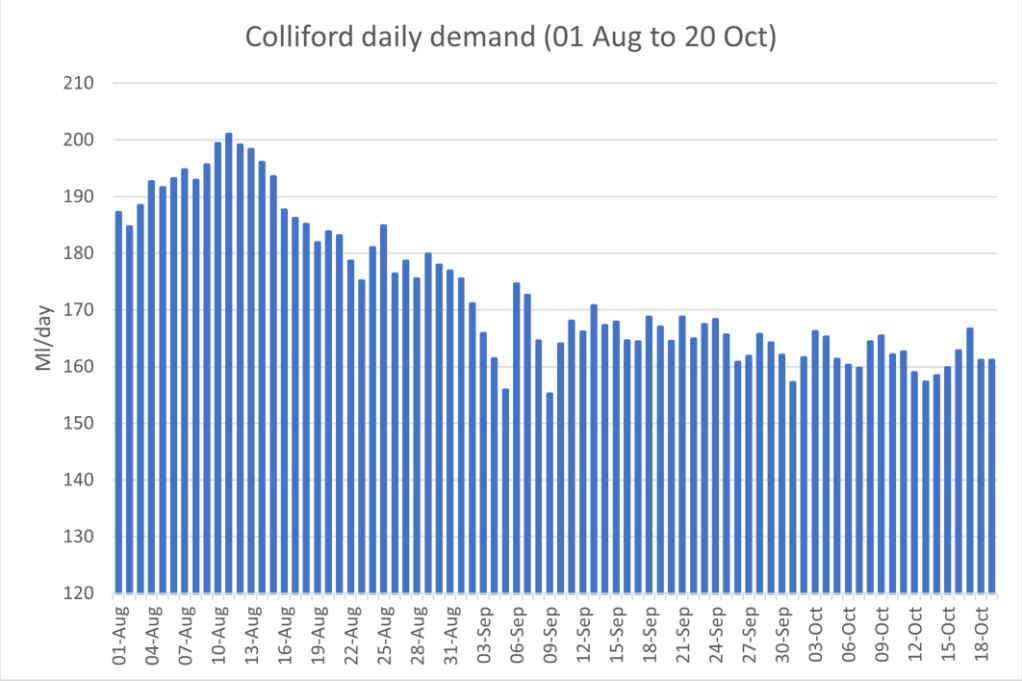
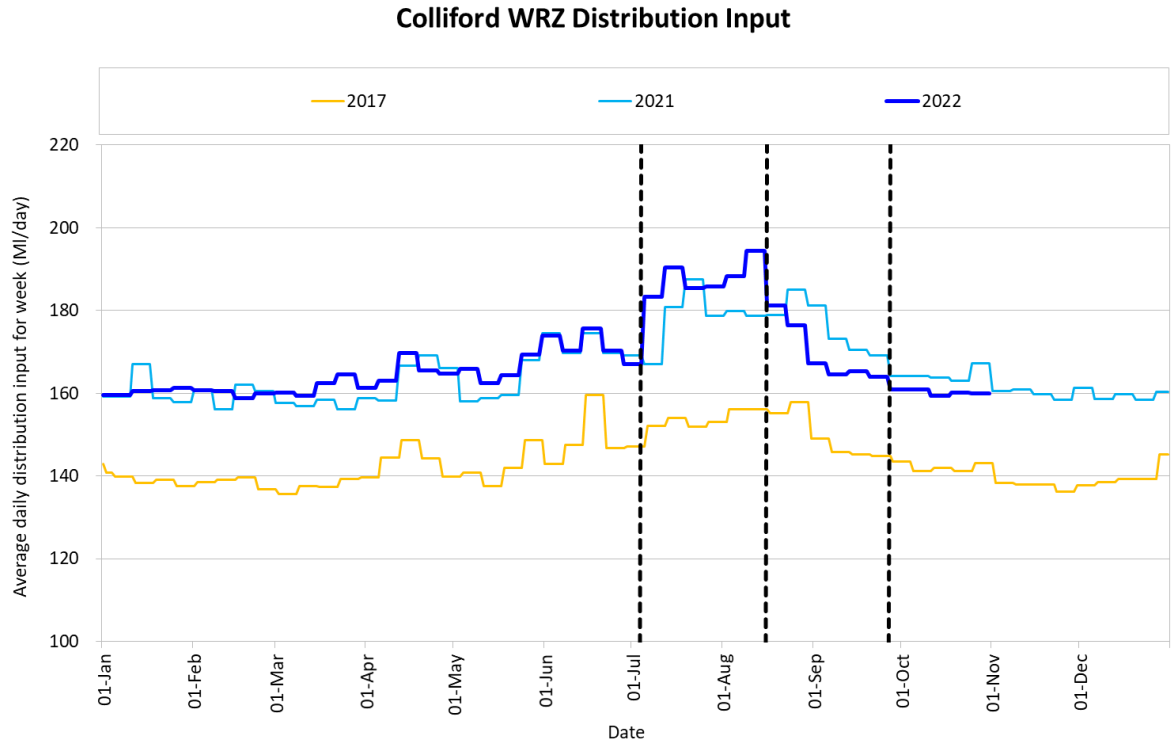


Figure 6 – Distribution input for Colliford WRZ comparing 2022 with 2021 and 2017



3.10 Other options considered

3.10.1 Tankering

The size of the Colliford WRZ means that tankering operations are not feasible over a longer period. Several hundred tankers would have to be deployed for water to be moved around the WRZ effectively.

3.10.2 Additional Sources

We are actively developing the engineering and drought permit requirements for additional sources. The Park Lake drought permit application is one of the named '*more before 4*' drought options. It follows the Level 1 and Level 2 drought permit applications already submitted and provides additional benefit to the planned Level 3 drought permit application for Porth/Rialton being planned for November 2022. This forms the third of a series of drought permits supporting the winter recharge of Colliford Reservoir, thereby reducing the risk to security of supply in 2023.

In addition to the eight operational treated water interventions outlined in more detail at paragraph 3.3 of this document, table 5 below shows the constraints on using other options in the WRZ to support Colliford. Activity is underway to overcome the constraints to Hawks Tor and Porth/Rialton; drought permit applications for both will follow.

Table 5 – Reservoirs in the Colliford WRZ, and actions that required to support Colliford Reservoir

Reservoir	Constraints on increasing abstraction beyond current rate to support Colliford Reservoir	Actions
College to Stithians treated water	Extent of pumping infrastructure of local treated water network.	Minor engineering works completed, and benefit realised since 01 October 2022
Stannon Lake	Abstraction licence	Application submitted 27 October 2022
Porth/Rialton	Disused source (last used in 1999)	Construction of temporary WTW and connection into treated water network underway anticipated December 2022. Drought Permit application expected November 2022.
Hawks Tor	Re-commissioning of assets required	Engineering scheme underway. Drought permit application expected November 2022.
Park Lake	Requires enhanced engineering works	This permit application.
Crowdy	Risk of critically low storage if dry until late autumn Constrained by extent of local treated water network.	Increase abstraction as soon as storage level permits
Drift	Risk of critically low storage if dry until late autumn	Increase abstraction as soon as storage level permits
Siblyback	Risk of critically low storage if dry until late autumn	Increase abstraction as soon as storage level permits
Stithians	Risk of critically low storage if dry until late autumn	Increase abstraction as soon as storage level permits

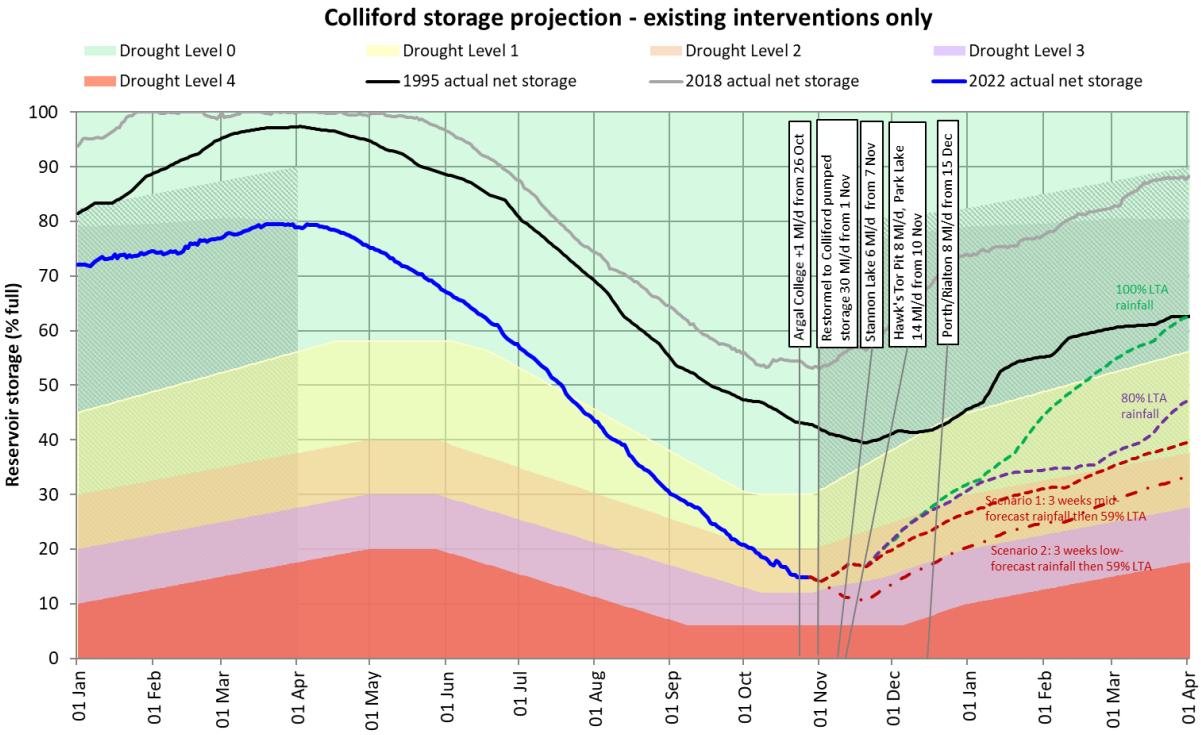
As outlined in the October 2022 Prospects Report, under all scenarios of LTA rainfall at 60%, 80% and 100%, the Restormel to Colliford recharge will still fall short of minimum

requirements to avoid entering drought trigger level 1 for 2023. This drought permit supports the winter storage recharge Colliford Reservoir with further actions still required to increase storage, including:

- The Implementation of drought permits:
  - Restormel pumped refill to Colliford.
  - Stannon Lake increased abstraction.
  - Park Lake abstraction increase.
  - Hawk's Tor refill to Colliford.
- Reactivation of disused sources:
  - Porth Rialton.

Based on the storage as of 28 October 2022 and updated weather forecasts, Figure 7 below demonstrates the benefits of all planned activities above and highlights the supply criticality of the interventions. With interventions, under a 100% LTA rainfall scenario recovery improves from 60% on 1 April 2023 to 50% and between 30-40% depending on 60% rainfall scenario.

Figure 7 – Colliford Storage Projection with interventions



3.10.3 Non-essential Use Bans (NEUBs)

South West Water is conscious that out of the 11,444 commercial properties in the Colliford WRZ (circa 4% of the total properties in the WRZ) there are only 14 large use commercial customers, and that this would limit any impact of NEUBs.

Given the limited rainfall within the Colliford catchment during September and early October, a revised projection on 17 October has forecast that under a 1995/96 dry autumn scenario Colliford Reservoir will cross the Level 3 trigger in early November, therefore in accordance with our drought plan we are actively considering for the implementation of NEUBs for the Colliford WRZ. Under current, 28 October 2022, worst case scenario Level 3 may still be crossed during November 2022.

Benefits from NEUBs are uncertain, and they have negative customer and societal impacts, and alternative initiatives are being considered in parallel. The additional abstraction from Park Lake presents a more certain increase in resources and has therefore been prioritised.

4 REFERENCES

Environment Agency, 2021, Drought permits and drought orders – Supplementary Guidance from the Environment Agency and Department of Environment, Food and Rural Affairs

South West Water, 2022, Final Drought Plan, September 2022.

5 FIGURES

6 TABLES