

4.0 Evidence the Company has followed its Drought Plan

October 2022



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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 15/48/18/S/40 as issued on 8 April 1987 ("**the Licence**") relating to abstraction from the River Fowey at the Restormel WTW ("**WTW**"), for the purposes of replenishing the storage levels at Colliford Reservoir.

1.1 Executive Summary

For the Colliford Water Resource Zone ("**WRZ**") we have executed our Drought Plan 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
- Commenced additional supply side options (engineering schemes), include new sources e.g. Park Lake and Hawks Tor
- Introduced TUBS in August 2022

In following the drought management plan our next prescribed step was to apply for this permit application. We anticipate that this will be the first of a number of drought permit applications as we continue to deliver actions outlined within the drought plan. We have already instructed Environmental Assessment Reports to support these applications.

South West Water achieved its best ever 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.

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 Restormel Abstraction Licence National Security Notice
2	2.1 2.2	Statement of Reasons Case for Exceptional Shortage of Rain (ESoR)
3	3	Restormel Drought Permit Environmental Assessment Report
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 and letter 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 also 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)

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 C1: Restormel Licence (Page A155) sets out that in circumstances of particularly low rainfall, a planned action is to increase pumping from the Restormel WTW.

Restormel Drought Permit Application 2022

Given the reliability of the River Fowey water source, and no infrastructure changes required, there is a high level of confidence associated with the benefits of implementing this action.

Bespoke winter storage pumps at the Restormel WTW intake are permanently installed to abstract from the River Fowey and have been used where there is available headroom within the Licence and recharge has been needed to support reservoir levels. These are all monitored and controlled through the local WTW Supervisory Control and Data Acquisition ("**SCADA**") control.

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	<ul style="list-style-type: none"> Enhanced media campaign Increased leakage control Enhanced pressure management Network optimisation 	
				Drought actions having a risk of minor environmental impacts: <ul style="list-style-type: none"> Optimising sources Outage Restormel Annual Licence*
Drought Plan	Level 2	> 1 in 500	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Stannon Lake*
Drought Plan	Level 3	>1 in 500	<ul style="list-style-type: none"> Non-essential use bans 	
				Drought Permits and ordinary Drought Orders having a risk of moderate environmental impact: <ul style="list-style-type: none"> Porth Reservoir and Rialton Intake
			All possible actions to avoid emergency Drought Orders: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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). However, as Restormel is one of the largest WTWs in Colliford WRZ, further environmental studies and assessment underpinned by appropriate monitoring and stakeholder engagement is anticipated for the Restormel Level 1 Drought Permit.

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

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 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.

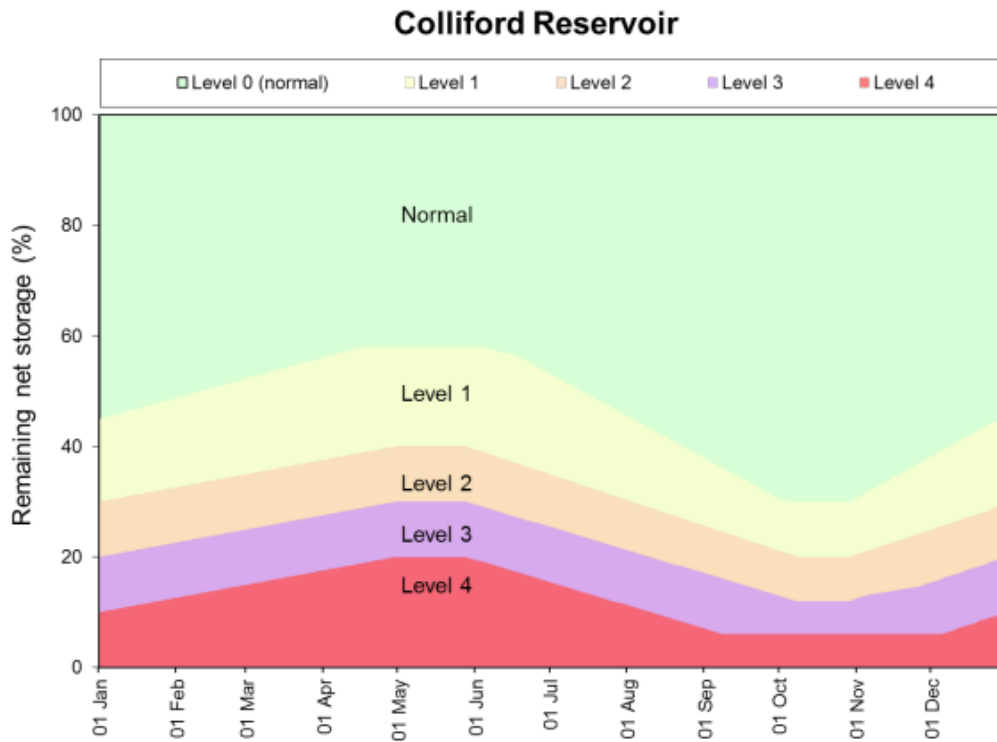
In the South West Water supply area, surface water abstraction dominates, with 90% of total abstraction being from rivers and reservoirs and with this abstraction being split roughly 50:50 between the two, although this ratio varies depending on the weather experienced in any particular year.

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



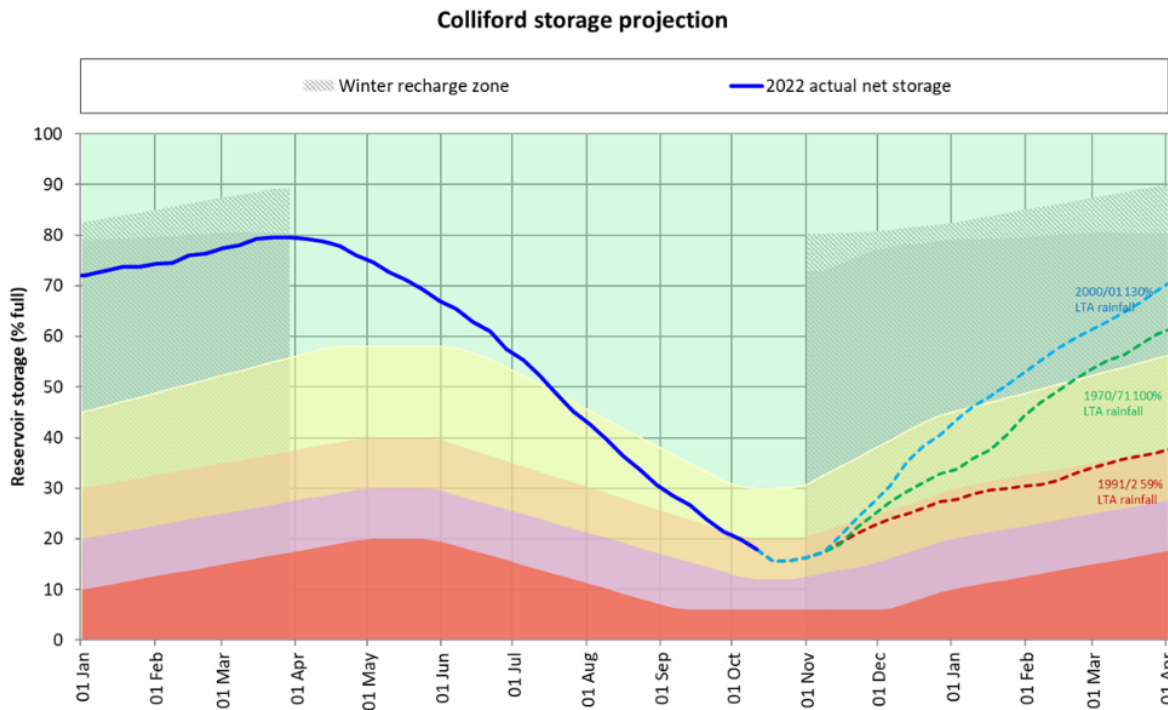
The drought management zones relate to levels of service and define drought management actions that could be taken. Figure 2 below sets out a summary of the actions that would be taken as the drought severity increases.

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

	Drought severity	Actions	
		Demand side	Supply side
INCREASING DROUGHT SEVERITY ↓	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 has now entered Drought Level 2. Figure 3 shows the projection as on 4 October 2022 as was submitted in the Prospects Report¹ submission. Colliford Reservoir has now entered Drought Level 2 and is projected to enter Drought Level 3 in early 2023, under the rainfall scenario of 66% long term average ("LTA").

Figure 3 – Colliford Storage Projections at as 12 October 2022



Subsequent modelling updated to reflect continuing weather forecasts and reflecting the storage position as at 12 October 2022, results in a further deficit to the 80% target.

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

¹ A prospects report is a forecast requested of water companies by the EA and DEFRA for a future period of time.

We have submitted the Environmental Assessment Report (*Document 3 Restormel drought EAR*) in respect of the drought permit application.

The monitoring and mitigation plan (*Document 3 Restormel drought EAR (Section 8)*) 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 leaky 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 continuing to encourage water-saving due to the previous eight months being exceptionally dry, despite rainfall in September.

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 the majority of its treatment works experience very low works losses (or process losses) as a result 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 all 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 have 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 MI/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)

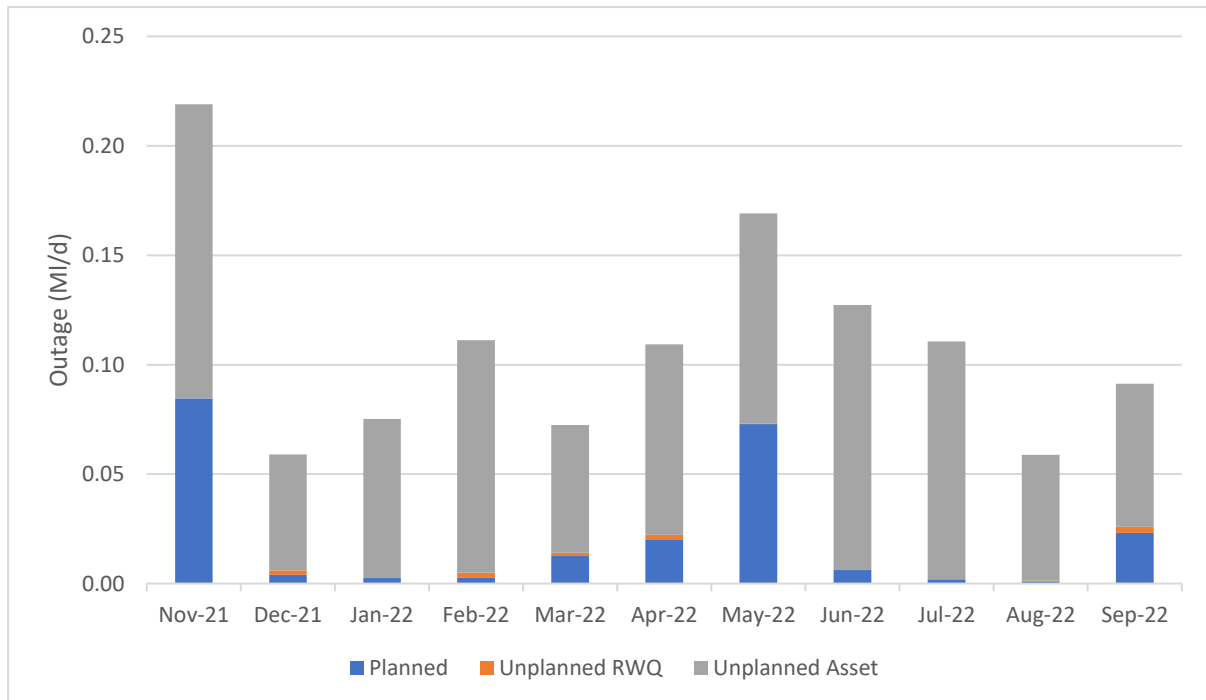
WTW	Planned	Unplanned Asset	Unplanned Raw Water Quality	Total
Colliford	0.23	0.96	0.01	1.20
Bastreet	0.01	0.01	0.00	0.02
College	0.01	0.02	0.00	0.02
De Lank	0.01	0.01	0.00	0.02
Drift	0.03	0.05	0.00	0.08
Lowermoor	0.02	0.49	0.00	0.51
Restormel	0.11	0.08	0.00	0.19
St Cleer	0.03	0.15	0.00	0.18
Stithians	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 MI/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 MI/d, which equates to a year-to-date allowance of 0.5 MI/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 and Tamar Lakes supply areas 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

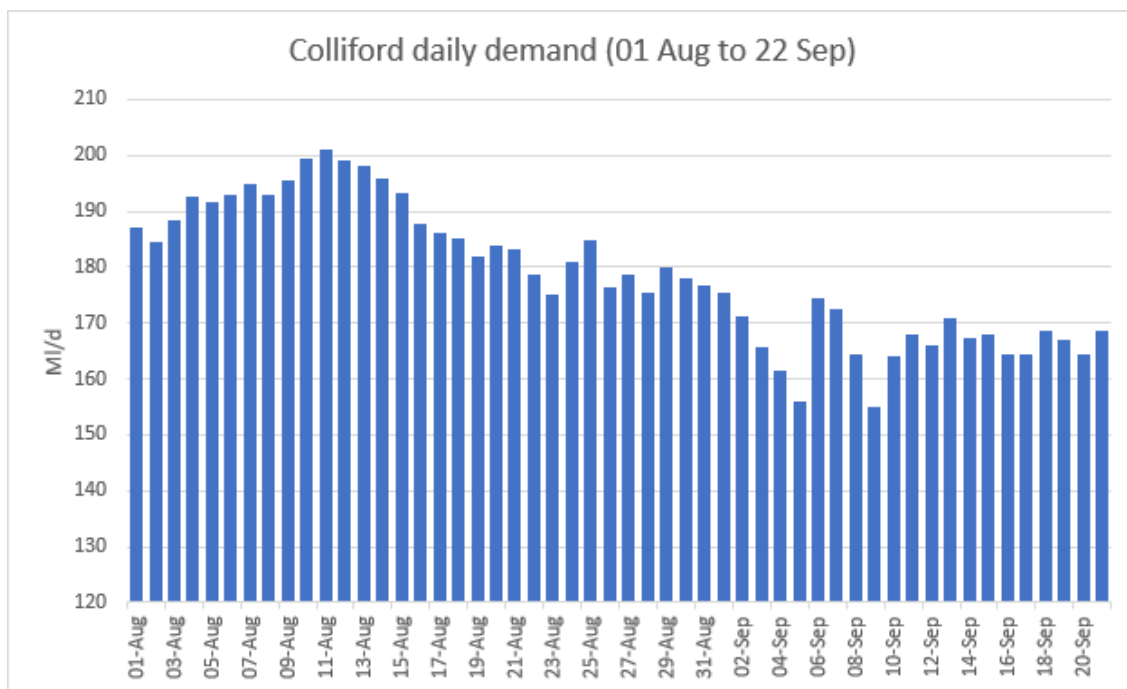
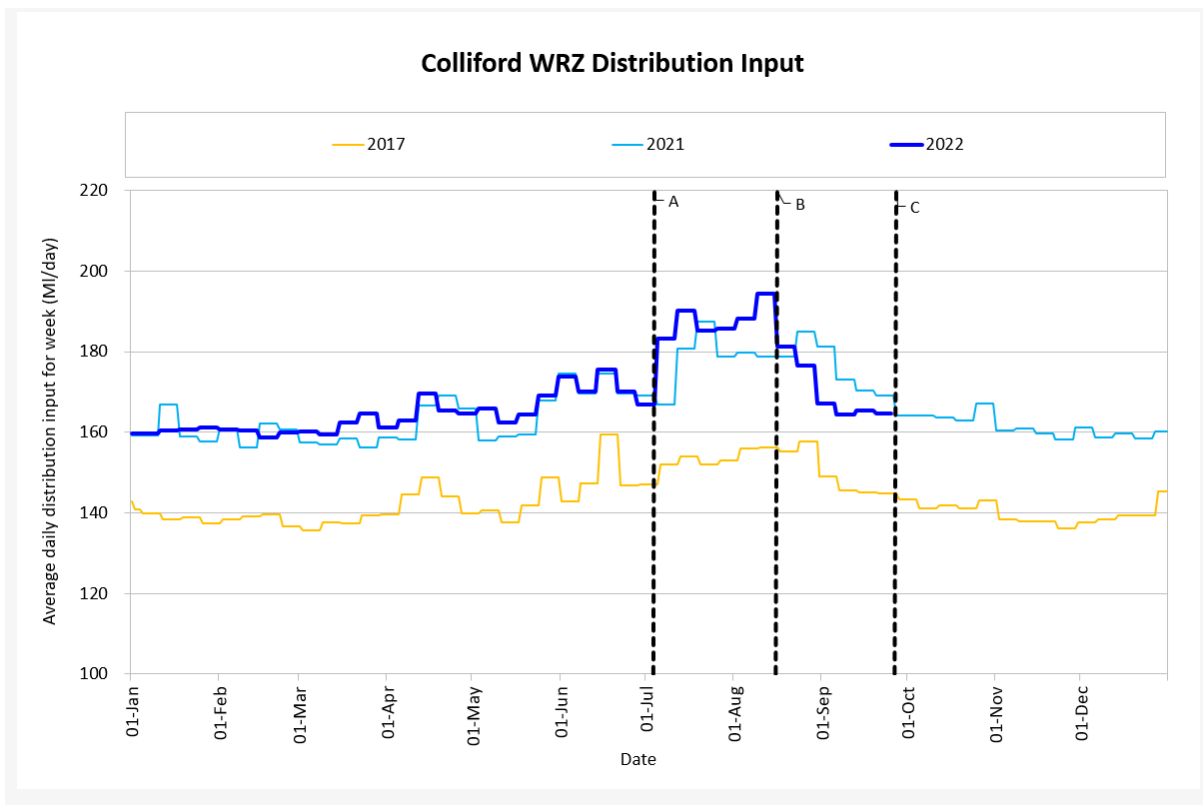


Figure 6 – Distribution input for Colliford WRZ comparing 2022 with 2021 and 2017



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 in order 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 Restormel drought permit application is named within our Drought Plan as the first option providing the greatest volumetric benefit, most immediate and potentially least environmentally impacting choice. Whilst significant it will not close the supply/demand gap for 2023. We therefore anticipate this will form the first 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. As can be seen from the table, Stannon and Park are the only other options which face minimal constraints, which is why drought permit applications are being progressed under those options. Similarly, we are progressing the engineering works required for abstraction at Porth and Hawks Tor.

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 will be completed during October.
Stannon Lake	Abstraction licence	Progressing drought permit application
Porth/Rialton	Disused source (last used in 1999)	Construction of temporary WTW and connection into treated water network underway
Hawks Tor	Re-commissioning of assets required	Engineering scheme underway
Park Lake	Requires enhanced engineering works	Engineering scheme underway
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

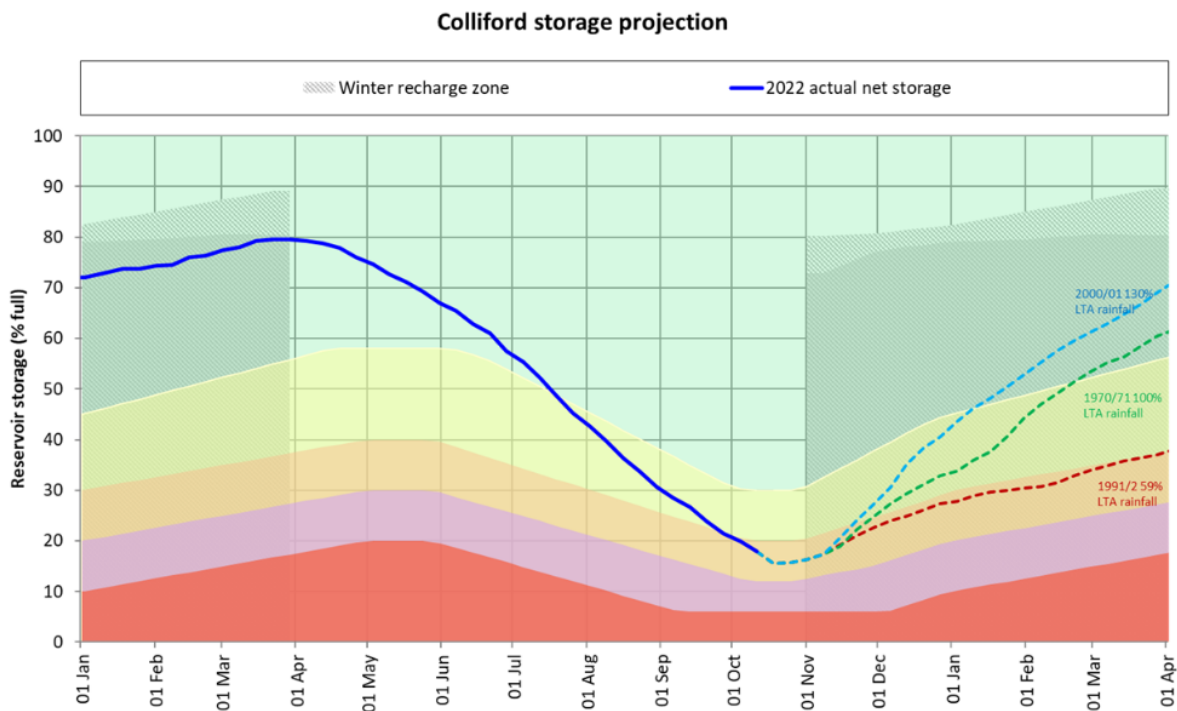
Restormel Drought Permit Application 2022

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 into drought trigger level 1 for 2023. This drought permit has been identified as the largest contributor to 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.
 - Hawk's Tor refill to Colliford.
- Reactivation of disused sources:
 - Porth Rialton.

Based on the storage as at 12 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.

Figure 7 – Colliford Storage Projection



3.10.3 Non-essential Use Bans (NEUBs)

Restormel Drought Permit Application 2022

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.

We are nevertheless routinely reviewing whether we should implement a NEUB for the Colliford WRZ through the drought management silver group.

Benefits from NEUBs are uncertain, and they have negative customer and societal impacts. The abstraction of additional winter flows from the Fowey presents a larger and more certain increase in resources and has therefore been prioritised. We have prepared material for NEUBs and talked to customers about their implementation.

This mechanism may still be required and will increasingly be considered if reservoir levels remain low.

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

Figure 1	Drought management zones for Colliford Reservoir
Figure 2	Summary of drought management actions for each drought level
Figure 3	Colliford Reservoir storage projection
Figure 4	Colliford outages over time
Figure 5	Daily demand from DMAs showing reducing demand since introduction of TUBS on 15 August 2022
Figure 6	Distribution input for Colliford WRZ comparing 2022 with 2021 and 2017
Figure 7	Colliford Storage Projections

6 TABLES

Table 1	Document structure for drought permit application
Table 2	Colliford WRZ drought action summary
Table 3	Analysis of outage by type in Colliford (1 April 2022 to 31 August 2022)
Table 4	Yearly outage allowance for Colliford.

Restormel Drought Permit Application 2022

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