Yorkshire Water Drought Permit Application

River Wharfe at Lobwood Supporting Information

Document Version Control

Version	Issue Date	Document	Authorised by
1.0	15/06/2025	Pre-application document for EA review	Jason Ball
2.0	18/06/2025	Updated to include more recent licences	Yasmina Gallaher
3.0	01/07/2025	Updated post EA comments	Jason Ball
4.0	23/07/2025	Final for Submission	Jason Ball

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1. Executive summary for drought permit application

An application is being made for a drought permit on the River Wharfe to temporarily increase river abstractions at low flows, allowing us to reduce the volume we put into supply from reservoirs. This helps conserve reservoir supplies until we receive sufficient rainfall for levels to return to normal, because of a dry spring in 2025. The site is included as a drought option in the Yorkshire Water Drought Plan 2022 available to view on the Yorkshire Water website (https://www.yorkshirewater.com/about-us/our-vision-and-plans/resources/drought-plan/).

Yorkshire Water has two abstraction licences from the River Wharfe at Lobwood and Arthington and is supported by Grimwith Reservoir. The water abstracted at Lobwood is pumped to Chelker reservoir which supports water production at Chellow WTW, which supplies Bradford and the surrounding areas.

As a result of the low rainfall our reservoirs are below average for the time of year and there is a risk to security of supply if we do not take action to conserve reservoir stocks as much as possible. We are applying for drought permits to conserve supplies in reservoirs in case the dry weather continues. These drought permits, if granted, will alter abstraction from some of our river sources and reduce the amount of water we release from reservoirs to rivers allowing us to maintain these compensation flows for longer, thereby aiding the recovery of these reservoirs.

2. Proposal description

Yorkshire Water is currently operating within the terms and conditions of the licence agreement held with the Environment Agency under licence number 2/27/19/129/R01 ("the Lobwood Licence"). We release compensation flow from Grimwith Reservoir to support the downstream environment under the terms of the impoundment licence NE/027/0019/011. The impoundment licence is unaffected by this drought permit application, although we have made a separate application to reduce the compensation flows in this impoundment licence.

The abstraction from the River Wharfe at Lobwood drought permit application concerns the level of abstraction from the River Wharfe, detailed in Section 2.2. It proposes a change to the support provided from Grimwith Reservoir as part of the normal abstraction regime, which is included as a drought option in the Yorkshire Water Drought Plan 2022.

We are applying for drought permits to remove the requirement to release an additional 22.7Ml/d from Grimwith reservoir to support our abstractions on the River Wharfe in the lowest flow band (see Table 2.2). Instead of releasing the total abstraction plus 22.7Ml/d, the permit will allow us to release a volume equal to the total abstraction.

Yorkshire Water is also permitted to abstract water from the River Wharfe at Arthington (SE 26 45), West Yorkshire under abstraction licence number 2/27/20/196/R01 ("the Arthington Licence"). A copy of the licence is provided. The licence conditions for the abstraction at Arthington also impose an obligation for Yorkshire Water to support abstractions from Lobwood and / or Arthington with releases from Grimwith Reservoir. This clause will also be amended in the Arthington Licence for the duration of the drought permits, if granted, although it is our operating policy to only use the Lobwood abstraction in the lowest flow band where a regulating release is required for both the Lobwood and Arthington abstractions.

2.1 Location map

The Yorkshire Water abstraction point relating to this application is on the River Wharfe at Lobwood (grid reference SE 07 51), north of Addingham in West Yorkshire. The abstraction is supported from Grimwith Reservoir (grid reference SE 06 64) in North Yorkshire, upstream of the Lobwood intake. Grimwith Reservoir releases are discharged to the River Dibb, which flows to the River Wharfe. The confluence of the two rivers is between the villages of Burnsall and Appletreewick.

A location map of Grimwith Reservoir and the abstraction points at Lobwood and Arthington is provided in Figure 1.

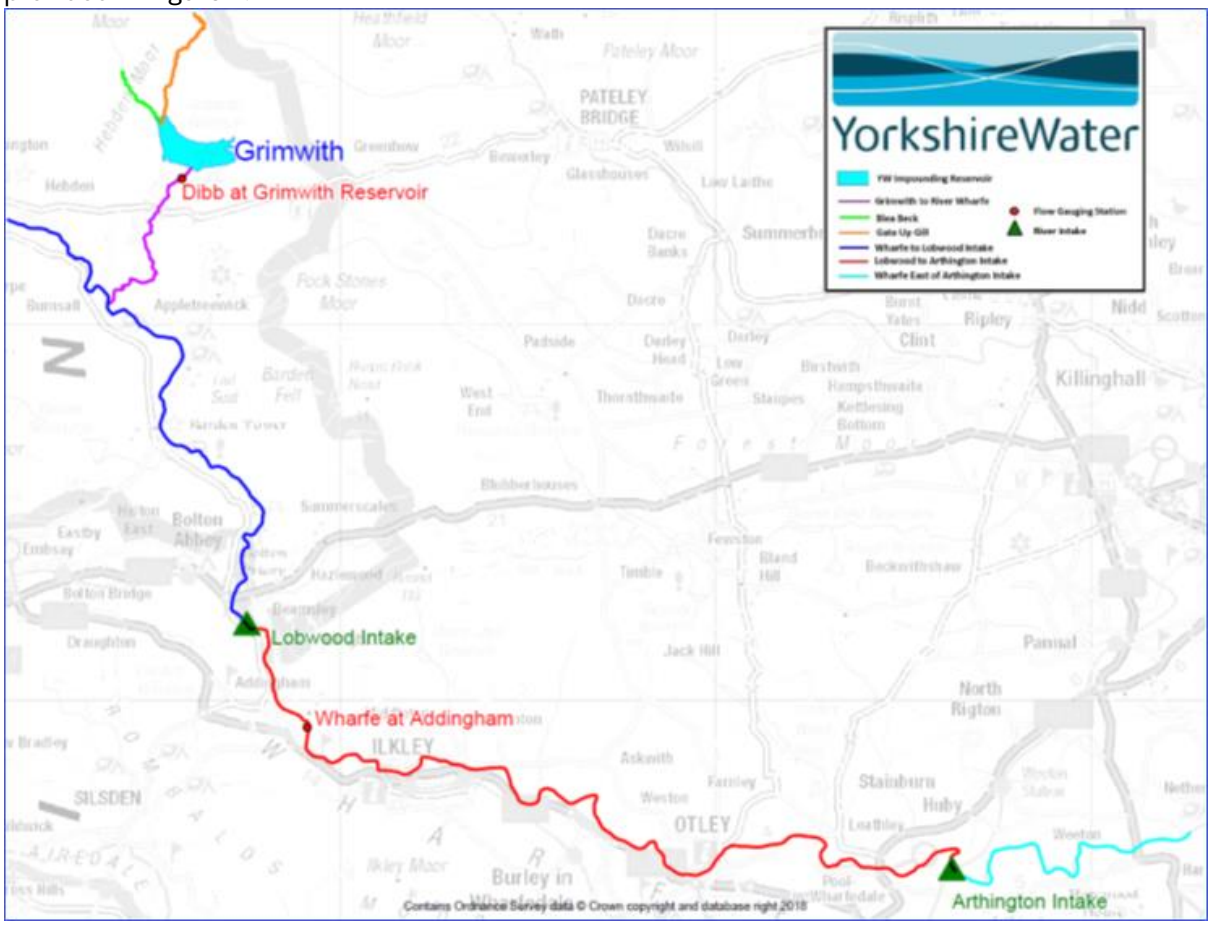


Figure 1: Location map detailing intake points for Lobwood and Arthington.

2.2 Current and proposed abstraction licence conditions

Yorkshire Water is authorised to abstract water from the River Wharfe at Lobwood for supply to customers under the terms stated in the abstraction licence. We are permitted to abstract a maximum of 5,060 cubic metres per hour, 93,200 cubic metres per day and 27,392 cubic metres per year, at an instantaneous rate not exceeding 1,406 litres per second.

The daily abstraction limit varies depending on flow conditions ('bands') in the River Wharfe, as measured at Addingham gauging station, and upstream releases from Grimwith Reservoir. Under the conditions of the Lobwood licence, during periods of low flow in the River Wharfe, we are required to support abstraction at Lobwood by releasing water from Grimwith Reservoir. When river flows are above 389 megalitres per day (Ml/d) (Bands A and B in the licence; refer Table 2), we do not have to provide any support. When river flows are between 252 and 389 Ml/d (Band C in the licence), we are permitted to abstract the volume of water being released from Grimwith Reservoir plus an additional

6.8 Ml/d. When river flows are below 252 Ml/d as measured at Addingham gauging station (Band D in the licence), we are required to support the abstractions on the River Wharfe at Lobwood and Arthington. We are allowed to abstract up to a maximum of 88.6 Ml/d at Lobwood and 28Ml/d at Arthington, and must release the sum of the combined abstractions at Lobwood and Arthington plus 22.7 Ml/d from Grimwith Reservoir.

The water abstracted at Lobwood is pumped to Chelker reservoir, which in turn feeds Chellow Heights water treatment works (WTW) and supplies Bradford and surrounding areas in West Yorkshire. Chellow Heights WTW is also supplied by Scar House and Angram reservoirs in the Nidd Valley and the Upper and Lower Barden reservoirs in the Wharfe Valley. In general, the use of reservoirs is maximised when stocks are above the Normal Control Line (NCL). Control lines are discussed in Section 4.3 and Section 6. When reservoir stocks are below the NCL the abstraction is reduced to the reservoir yield where possible, and the use of rivers is increased.

The output from Chellow Heights WTW is required to ensure Bradford and surrounding areas are supplied with water. The Lobwood abstraction is a major source of supply for the Chellow system, as the only river source supplying Chellow Heights WTW. The system requires Lobwood to be used for most of the time; supplies could only be maintained for a few days without an abstraction at Lobwood.

On days when not releasing from Grimwith Reservoir to support downstream abstraction, compensation flows are released to the River Dibb as summarised in Table 1. Changes to compensation flows have been applied for in a separate drought permit application for the North West Area.

Date	Compensation flow releases (Ml/d)
1 January to 19 April	15.1
20 April to 10 May	7.8
11 May to 11 October	3.8
12 October to 31 October	7.8
1 November to 31 December	15.1

Table 1: Summary of compensation flow requirements

The current annual and daily maximum abstraction licence permissions at Lobwood on the River Wharfe and proposed changes for the duration of the drought permit are shown in Table 2, (changes underlined). The daily permitted volumes are dependent on the flow on the River Wharfe.

	Licence agreement conditions		**Proposed drought permit conditions**	
Gauged flow Ml/d (at Addingham Gauging Station)	**Allowed abstraction Lobwood Ml/d**	**Allowed abstraction Arthington Ml/d**	**Allowed abstraction Lobwood Ml/d**	**Allowed abstraction Arthington Ml/d**

>580	93.20	78	93.20	78
>488 (Band A)	93.20	34.1	93.20	34.1
>389 (Band B)	88.60	25	88.60	25
>252 (Band C)	Grimwith release plus 6.8, up to maximum of 88.6	25	Grimwith release plus 6.8 up to maximum of 88.6	25
<252 (Band D)	Grimwith release less 22.7, up to maximum of 88.6*	Grimwith release less 22.7, up to maximum of 25*	Grimwith release up to maximum of 88.6**	Grimwith release less 22.7, up to maximum of 25*
* If abstraction is taking place at both Lobwood and Arthington, the total Grimwith release must be at least 22.7Ml/d greater than the combined abstraction ** If abstraction is taking place at both Lobwood and Arthington, the total Grimwith release must be at least the combined abstraction				

Table 2: Current Licence and Drought Permit proposals

The drought permit application is to temporarily amend the Licence to abstract the full volume released from Grimwith Reservoir when river flows are in the lowest flow band (Band D). In Bands A, B and C there would be no change to the permitted abstraction rates. The abstraction rates (hourly, daily and instantaneous maxima) specified in the licence for differing flow bands in the River Wharfe are not affected by the drought permit application. The maximum abstraction rate of 88.6 Ml/d in Band D is also unchanged.

The licence conditions for the Yorkshire Water abstraction at Arthington also impose an obligation to support abstractions from Lobwood and / or Arthington with releases from Grimwith Reservoir that are 22.7 Ml/d greater than the abstracted volume when river flows are in Band D. This clause will be amended in the Arthington Licence for the duration of the drought permit, if granted, to allow the full volume released from Grimwith Reservoir to be abstracted from Lobwood when river flows are in Band D.

We will not use Arthington in the lowest flow band (Band D), because this would require a release from Grimwith depleting Grimwith reservoirs stocks, which our modelling shows would already drop to a low level in an extreme dry weather scenario. Therefore, this application for the River Wharfe only applies to the abstraction at Lobwood, but this requires an amendment to the Arthington licence because the special conditions for abstraction in Band D also state the requirements to abstract at Lobwood The environmental assessments have been carried out on this basis.

2.3 Proposed start & expiry date for permit

Yorkshire Water propose the drought permits are implemented as soon as determined, and be in place for a period of 6 months from this date.

3. Draft permit

See appended draft Drought Permits (Appendix 3).

4. Drought permit justification

4.1 Why the permit application is necessary?

This drought permit application is necessary due to an exceptional shortage of rain threatening a serious deficiency of supplies of water in the area supplied by Yorkshire Water. Evidence to demonstrate the exceptional shortage of rain in the area is provided in Section 5 below.

We are applying for a drought permit on the River Wharfe to conserve reservoir stocks if the dry weather continues. The permit will allow us to increase our use of the river during low flows. This will reduce the volume of water we are required to put into supply from reservoirs so that we conserve the supply for use later in the year.

4.2 Supply areas & respective populations impacted

The drought permit, if granted, will alter how we operate our River Wharfe abstraction which supplies water to our Grid SWZ. As this abstraction is part of our conjunctive use grid system and can be used to support (directly or indirectly) all our five areas, the population affected by the water shortage is that of our Grid SWZ (5,414,690 for 2024/25 as estimated population from our final WRMP 2024).

The Wharfe at Lobwood abstraction is primarily used to supply Bradford and Skipton forecasting zones (which includes Ilkley and Keighley), water can also be exported to parts of the Wakefield FCZ, the Calder FCZ and the Leeds FCZ. The Skipton/Keighley forecasting zone (FCZ) population is approximately 132,535 and the Bradford FCZ population 564,546 based on most recent census data. The export to the Wakefield FCZ can supply up a population of up to 74,500, the export to the Calder FCZ a population of 57,295 and the export to Leeds FCZ a population of up to 16,407. Therefore, all these areas combined gives a total population of approximately 845,283 in total.

4.3 Daily water demand and how it is met from the available source

Our reservoir control lines represent the value of reservoir storage that is required to guarantee a continuous rate of supply (equivalent to yield) such that the reservoir storage never falls below a critical storage line given the minimum historical inflows.

We calculate two sets of control lines:

- Drought Control Line (DCL) - the DCL is designed such that stocks will never fall below marginal storage when the reservoirs supply 85% of their calculated yield.
- Normal Control Line (NCL) - the NCL is designed such that stocks will never fall below the DCL when the reservoirs supply their calculated yield.

Once we have calculated the NCL and DCL, we linearly interpolate between the 100% full level and the NCL, the NCL and DCL, and the DCL and emergency storage level, to obtain the ten control lines (CLs) used in our modelling and reservoir stocks monitoring. The NCL is control line (CL) 3, the DCL is CL7, and we use CL4 as the Environment Agency trigger line. This is the trigger for Yorkshire Water and the Environment Agency to initiate communications around a potential emerging dry weather situation.

The control lines are updated on a regular basis and were last updated in 2022 based on minimum inflows from 1900 to 2022. We have remodelled our historic inflows using GR6J rainfall runoff models and extended our historic record back to 1900.

Control lines have been revised since our most recent drought plan, but the triggers in our drought plan related to control lines are still applicable to the updated control lines. We will carry out a further review of our control lines after the current drought period has ended, and when inflows are updated to include this current period.

When our reservoir levels drop below NCL, our operating strategy is to reduce reservoir abstraction to yield and increase river abstraction while still meeting daily demand. The increased river abstraction is a combination of abstraction for treatment and distribution and pumping river water to reservoir storage. In line with this strategy, we increased use of river abstraction when we dropped below NCL in March. Average reservoir abstraction in Q1 (Jan-Mar) was 685Ml/d, this reduced to an average of 584Ml/d in Q2 (Apr-Jun). River abstraction has increased from a Q1 average of 437Ml/d to an average of 523Ml/d in Q2. When river levels have increased in Q2 we have been able to maximise abstraction, reducing reservoir use as close to minimum as possible. For example, higher river levels in the first 2 weeks of June allowed us to increase river abstraction to an average of 587Ml/d reducing reservoir

abstraction to an average of 487Ml/d. We will continue to maximise river abstraction within licence constraints.

4.4 Forecasted effects of continued dry weather on customer supplies

Our current modelling is based on a 1995/1996 inflow scenario which is our worst case 12-month historical period with approximately 60% long-term average (LTA) rainfall over a 12-month period. The model outcome indicates that with current WTW availability and a similar reservoir inflow to 1995/1996, we would require a temporary use ban (TUB) and will require further drought permits (on rivers and in other areas), however, customer supplies will not be impacted. Our latest WRPR forecast (at the time of preparing this application) indicates that the forecast date for TUB and drought order / drought permit implementation across Yorkshire Water regions will be 14/07/25 and 25/08/25 respectively.

5. Case for an exceptional shortage of rain (ESoR)

Full details of events and climatic conditions that have led to the need for the drought permits is described in this section.

5.1 Introduction

In this section, we demonstrate an exceptional shortage of rainfall by analysis of monthly rainfall following the Environment Agency (EA) guidance document ('Hydrological guidance for the assessment of an Exceptional Shortage of Rain (ESoR)', 2025). We demonstrate that ESoR has primarily led to a serious risk of deficiency of supplies in the River Wharfe catchment. The geographical extent and the time period of analysis have been agreed with the local EA Hydrology (Yorkshire) team.

The following rainfall analysis has been conducted to support our assessment:

- Plots of 2025 rainfall in relation to long term average (LTA) and previous droughts
- Standardised Precipitation Index (SPI)
- Rainfall ranking compared to records starting in 1871
- Calculation of Cunnane plotting position

We also present additional evidence for the following non-rainfall variables:

- River flows
- MORECS Soil Moisture Deficit

In each subsection, we start by showing the requirements as set out by the EA (Appendix A – ESoR checklist for water companies March 2025 v2.1) in grey boxes. Following such text boxes, we present our approach and analysis in response to those.

5.2 Rainfall data

- You must use areal rainfall data for the catchment area of interest.
- In most circumstances, you should use the Environment Agency's HadUK/DRT dataset Data for hydrological areas is provided to water companies monthly. If the Hydrological Areas are not appropriate, then rainfall data can be extracted for a bespoke catchment area from the HadUK/DRT dataset by Environment Agency hydrologists. You must fully explain which dataset has been used and why. Recent data from third party websites may underestimate complete monthly rainfall totals.

The rainfall data used in this assessment was provided by the EA Hydrology Yorkshire team. The data included is the HadUK v1.2.0.0 monthly totals covering January 1871 to December 2023 (inclusive) and the EA Daily Rainfall Tool (DRT) monthly totals covering January 2024 to June 2025 (inclusive). The use of the HadUK/EA DRT rainfall data allows analysis of long time series dating back to 1871. The rainfall data covers the River Wharfe catchment up to the Addingham gauge, a short distance downstream of the Lobwood intake. The measured flows at the Addingham gauge are used to determine how the abstraction from the river is operated in accordance with the licence definition. It is therefore the critical location in relation to this permit application as agreed with the EA Hydrology Yorkshire team. The geographical extent will be provided and described in greater detail in section 5.4.

- If you have calculated areal rainfall yourself (you are strongly advised to avoid this):
- You will need to demonstrate that your data is of better quality and/or more hydrologically relevant than the HadUK/DRT dataset.
- Set out the limitations of the dataset.
- Your areal rainfall should be calculated in accordance with British Standard BS7843-4:201296. The rain gauges used must be quality controlled, have minimal missing data and be operated in accordance with British Standard.

We can confirm that we have not calculated the areal rainfall data ourselves and have used the data provided by the EA as explained above.

5.3 Period of analysis

- Determine the start and end point of the period of analysis before starting the assessment. This is the period of the rainfall deficit which is used to support the ESoR case. You should agree the period of analysis with the relevant Environment Agency hydrologist, the Area Drought Coordinator and water company lead.
- The application should be submitted as soon as possible once the need for a Drought Permit has been identified aor as soon as possible. [as written]
- Start of the period of analysis:
- Provide clear evidence (e.g. charts/graphs) of the point at which rainfall is lower than normal.
- Justify how the variables used here are reflective of the water supply situation in the catchment area of interest.
- End of the period of analysis
- Provide clear evidence (e.g. charts/graphs/reference to Drought Plan) that the rainfall deficit has triggered the need for a drought permit.
- Use the latest rainfall data at the point of the application.

The period over which the analysis has been conducted was agreed with the EA Hydrology Yorkshire team. This drought can be characterised as relatively short but of high intensity compared to previous recorded droughts. As a result, the onset of the exceptional shortage of rainfall was agreed to be February 2025. Although January 2025 has also seen lower than average rainfall in the Wharfe catchment (see Figure 3), to be consistent with the assessment in our other regions, February 2025 will be the start of the period of analysis for all of our regions. The latest rainfall data up until the point of application has been used in this assessment representing a 5-month period from February to June 2025.

5.4 Geographical extent of analysis

- Provide justification for the catchment area used in the analysis, this may be one or several of the Environment Agency's hydrological areas, a bespoke catchment or water resources zone.
- Provide evidence of how the rainfall deficit is relevant to the catchment area of the public supply source or the wider integrated water resource zone/subunit of this zone.
- It is recommended that catchments should contain one or more Met Office registered rain gauge located within them.

The geographic extent of the analysis was agreed with the EA Hydrology Yorkshire team as shown in Figure 2. We have used the River Wharfe catchment at the Addingham gauging station, this is because Addingham is the monitoring location used to regulate the permit this application relates to. A wider catchment of the whole River Wharfe would therefore be less relevant to this application. The rainfall has been consistently low across the whole catchment and therefore there was no need to investigate individual areas separately. Also to note, Yorkshire Water uses a grid system to balance supplies across the network, therefore the shortage of rainfall in this area is relatively uniformly felt across the Yorkshire Water supply zone.

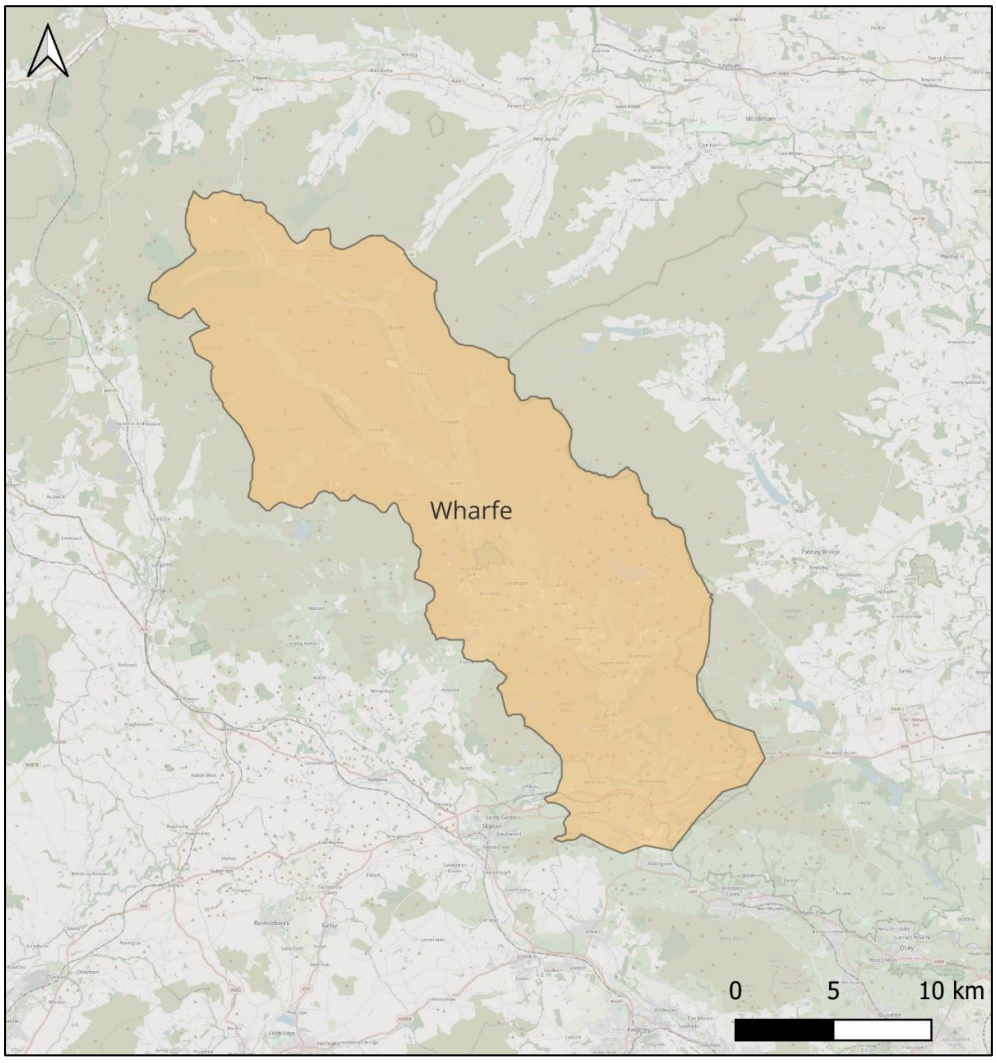


Figure 2: Geographic extent of the exceptional shortage of rainfall analysis

5.5 Technical rainfall analysis methods

- Refer to the Environment Agency's supplementary guidance on drought permits and drought orders, available on request from Water-company-plan@environment-agency.gov.uk
- Use the same rainfall dataset (usually HadUK/DRT) for each analysis method (asset out in the sections above) and the same historic period of record (from 1871)
- 1961 to 1990 should currently be used as the period of record for Long Term Averages (LTA) assessment (this is planned to be updated to 1991 to 2020, and this document will be updated to reflect that)
- Use your assessment period of analysis for each method as your main evidence. If you use any shorter periods as supporting evidence (for example, the winter refill period), you must justify how these are relevant to the water resource situation
- Detail any limitations and uncertainties associated with the methodology, and the possible impacts on the results

Rainfall comparison with the LTA and historical droughts

Figure 3 shows the rainfall during December 2024 to June 2025 in comparison to the monthly long-term averages (LTA). The LTA was calculated using the new 1991-2020 standard period which was confirmed by the EA Hydrology Yorkshire team to be taken for the calculation of LTA. Although we have received average rainfall across May and June, rainfall was very low between February to April leaving the ground very dry. Although it can be seen that January 2025 has also seen below average rainfall, it is not part of the period of analysis adopted by Yorkshire Water for two reasons: (1) Yorkshire Water uses a grid system to balance supplies across the network, therefore the shortage of rainfall in the entire area is relatively uniformly felt across the Yorkshire Water supply zone; and (2) In order to be consistent in the assessment of ESoR with other regions (where January 2025 did not have below average rainfall), February 2025 will be the start of the period of analysis.

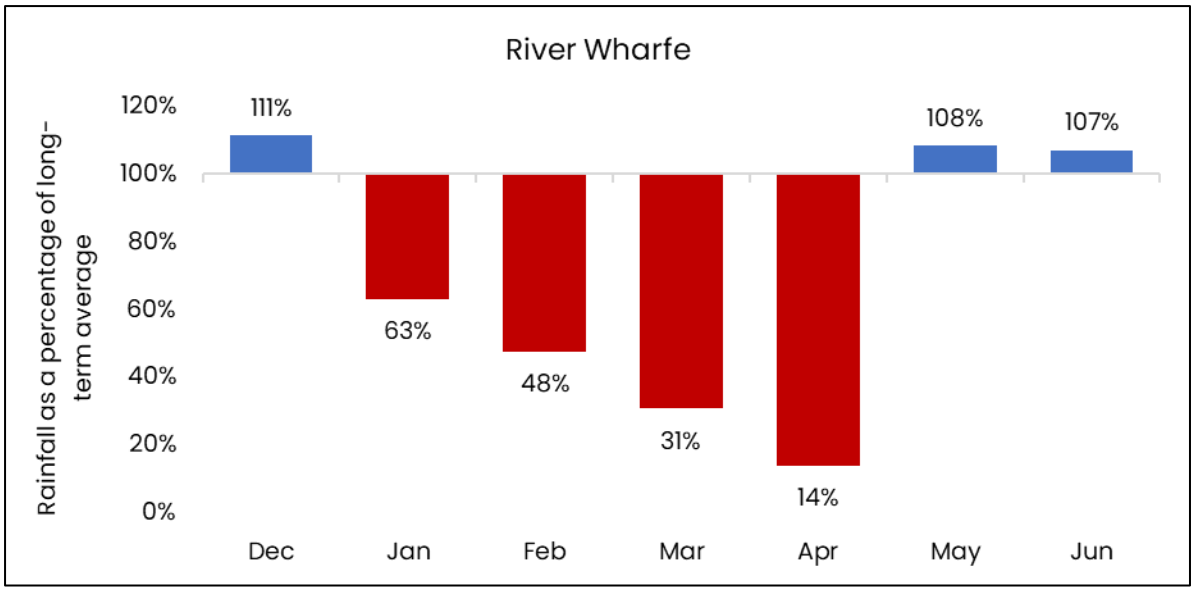


Figure 3: Rainfall compared to long-term average

Figure 4 Shows the cumulative rainfall starting from the end of January for the analysis period, in comparison with the LTA and the two most significant recent droughts (2022 and 1995). Rainfall from 2020 is also included for comparison purposes as the year was characterised by very low rainfall in the spring. The rainfall for this period is notably lower than the historic droughts and the LTA.

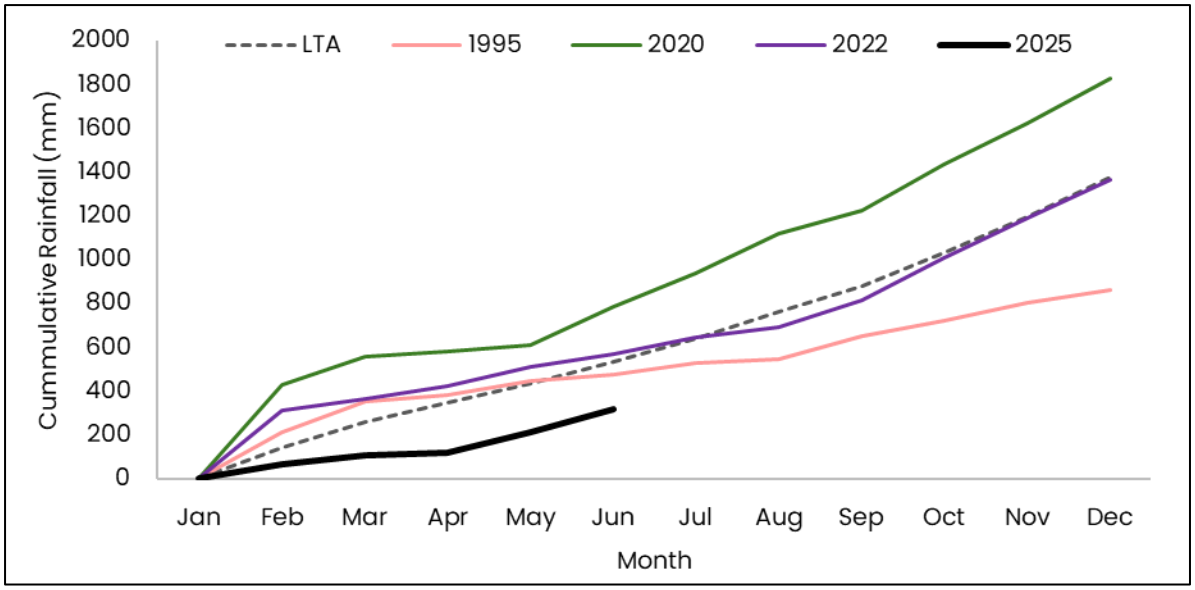


Figure 4: Cumulative rainfall compared to historic droughts and long-term average

Standardised Precipitation Index (SPI)

The Standardised Precipitation Index (SPI) values can be interpreted as the number of standard deviations by which the observed anomaly deviates from the long-term mean. The SPI can be calculated for differing periods using monthly input data. We have calculated the SPI for all the monthly rainfall data listed in Figure 5 for a 1-month, 3-month and 5-month duration (i.e., 1-, 3-, and 5-month window respectively leading to the month shown in the first column). The 5-months from February to June are considered severely dry for the River Wharfe catchment according to the index categorisation. The 5-month period up to May is considered extremely dry as well as the 3-months prior to April and May.

SPI of 2025 rainfall for the River Wharfe Catchment			
2025	**SPI - 1month**	**SPI - 3month**	**SPI - 5month**
February	-0.599	-0.241	-0.738
March	-1.693	-1.777	-1.156
April	-2.657	-2.739	-1.343
May	0.402	-2.052	-2.192
June	0.545	-0.552	-1.574

SPI Category:						
Extremely Wet **(≥ 2.0)**	Severely Wet **(1.5 → 2.0)**	Moderately Wet **(1.0 → 1.5)**	Near Normal **(1.0 → -1.0)**	Moderately Dry **(-1.0 → -1.5)**	Severely Dry **(-1.5 → -2.0)**	Extremely Dry **(≤ -2.0)**

Figure 5: Standardised precipitation indices for the Wharfe catchment

Rainfall Ranking

The ranking of the rainfall periods compared to the historic dataset is shown in Figure 6. Different periods preceding the period of analysis are presented up to a twelve-month duration. For example, the accumulated rainfall for the 11 months leading up to February 2025 was the 65th driest on record. The Cunnane probability ranking has been calculated for each duration and the rankings are shaded accordingly. Rainfall durations of one to four months preceding April 2025 are all in the top two driest periods and are classified as exceptionally low rainfall according to the Cunnane probability ranking.

The 5-month period up to June 2025 is notably low and the 4-months preceding May 2025 are the 2nd driest on record.

Rank of 2025 rainfall in period since 1871

River Wharfe 2025		Duration (months)											
		1	2	3	4	5	6	7	8	9	10	11	12
End Month	Feb	38	29	57	41	35	43	41	33	35	48	65	87
	Mar	10	8	7	35	21	17	29	24	20	19	31	49
	April	2	1	2	2	16	9	10	12	12	10	10	17
	May	101	18	3	2	4	18	12	12	18	14	15	12
	June	110	105	41	12	10	7	26	18	19	28	21	17

Cunnane Probability Ranking:

Exceptionally high (> 0.95)	Notably high (0.87 → 0.95)	Above normal (0.721 → 0.869)	Normal (0.28 → 0.72)	Below normal (0.131 → 0.279)	Notably low (0.05 → 0.13)	Exceptionally low (< 0.05)

Figure 6: Rainfall ranking compared to historic dataset dating back to 1871

5.6 Supporting information

The following section summarises non-rainfall analysis as supporting evidence.

Soil Moisture Deficit (MORECS)

We have used the Met Office Rainfall and Evaporation Calculation System (MORECS) to estimate Soil Moisture Deficit (SMD). Data from the MORECS database is less granular than rainfall data, as it is aggregated to 40 x 40km grids. This limits our ability to present data specifically for the geographic extent of the River Wharfe catchment. As advised by the EA Hydrology Yorkshire team, we present data for grid square 92 which covers the largest extent of the River Wharfe catchment. Figure 7 highlights the current trend in 2025 versus historical years dating back to 1993 as well as key droughts in this time. The SMD is currently above the 90th percentile and significantly greater than the 2022 and 1995 drought years.

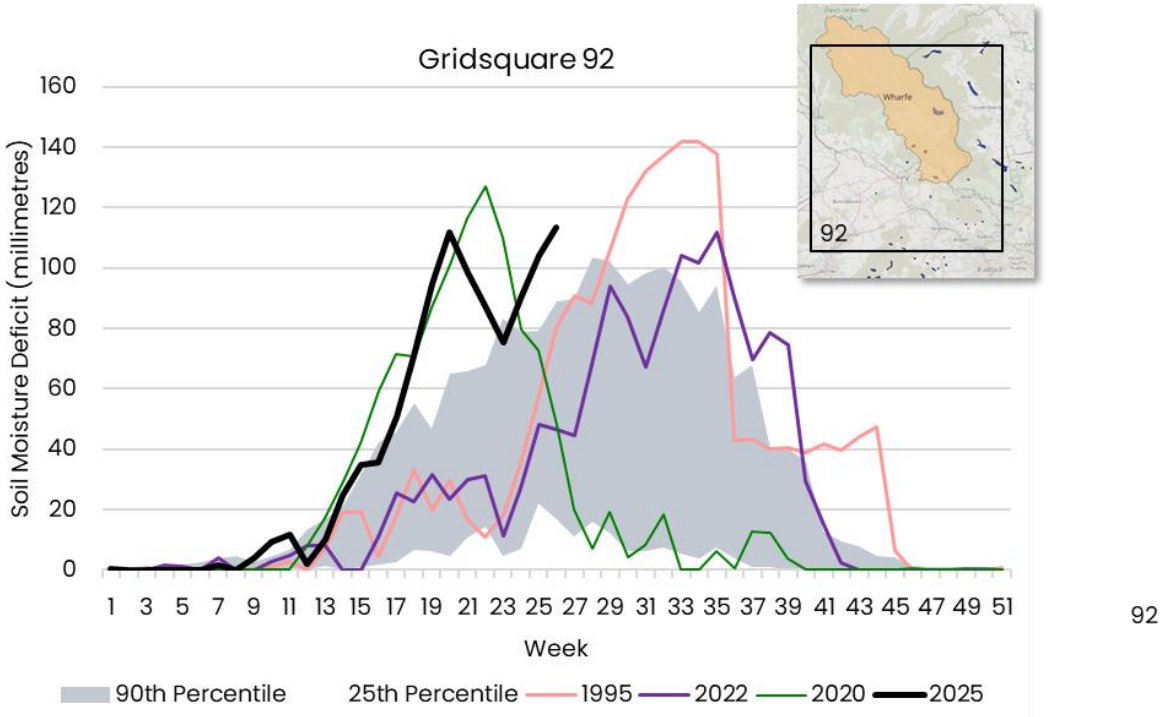


Figure 7: Soil moisture deficit in the River Wharfe area

River Flows

Figure 8 shows the River Wharfe flow rate at the Addingham gauge across 2025 and the driest years since 1989, including the key historical drought years of 1995 and 2022. The most remarkable feature of this plot is the consistently low flow between the start of March 2025 and the end of May. Flows in the River Wharfe are highly sensitive to rainfall events, typically rising and falling rapidly. Due to the prolonged exceptional shortage of rain, the river flows in early 2025 were consistently below the lowest flow band of 252 Ml/d between 3rd April and 26th May 2025. The flows rose above the aforementioned flow band briefly following rainfall in late May and late June but not for a sustained period of time.

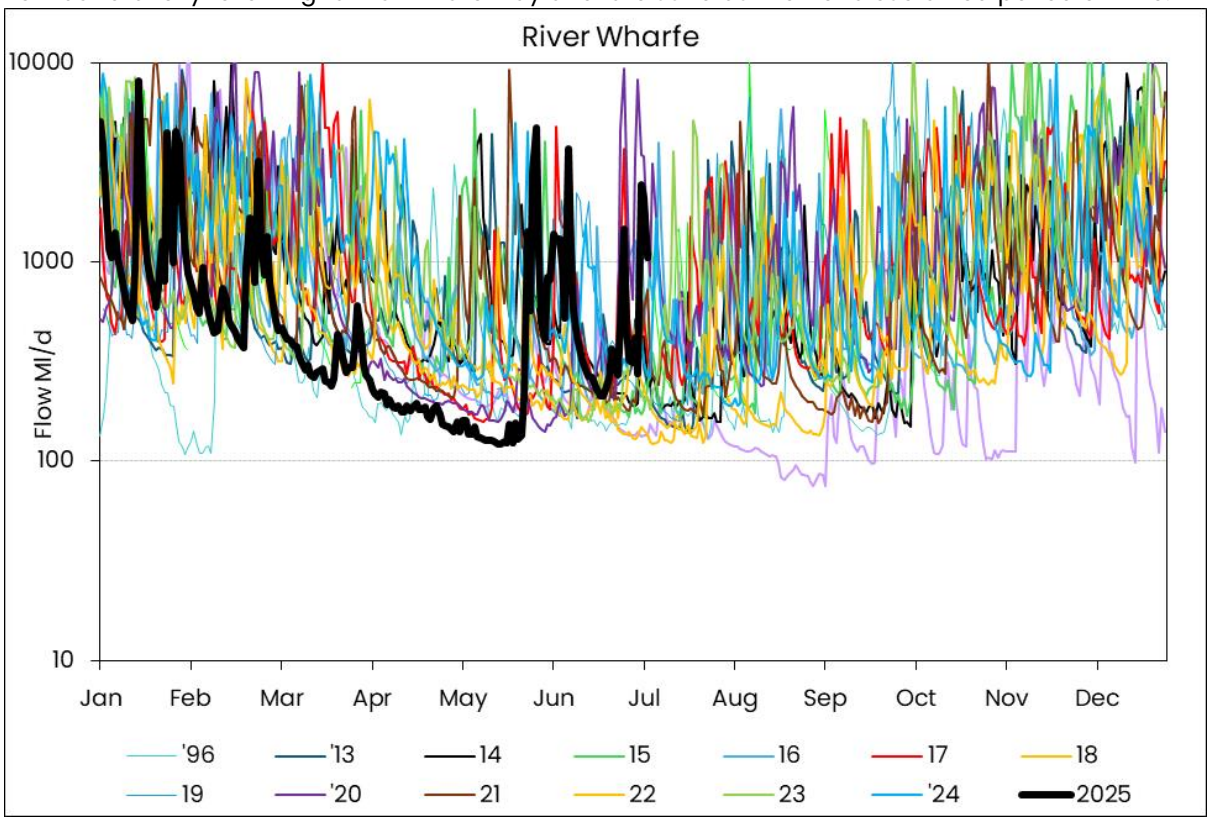


Figure 8: Flow in the River Wharfe compared to previous years

5.7 Summary and conclusions

The spring of 2025 has been exceptionally dry. Across the River Wharfe catchment, the 5-month period to June was severely dry and had notably low rainfall, while the 4-month period to May was the 2nd driest since records began in 1871. The SPI and ranking analyses indicate conditions were extremely or exceptionally dry across several durations within the analysis period.

The low rainfall so far in 2025 has been accompanied by periods of hot weather, and this combination of hot dry weather has resulted in high SMD values. As a result, when there has been intermittent rainfall, it has not resulted in significant runoff to rivers. The River Wharfe has had exceptionally low flows for a prolonged period, and this has resulted in record low reservoir levels for this time of year.

The dry weather means we must be ready to take action to avoid water shortages later in the year. If the exceptionally low rainfall continues (or even if there is below LTA rainfall during the summer), our forecasting models predict extremely low reservoir levels and the need for further drought measures according to our drought plan.

6. Evidence supporting drought plan has been followed

Our Drought Plan details a number of actions that we would follow when triggers are met. These can be found in Table 2.3 "Drought plan triggers and associated actions" of our Plan (https://www.yorkshirewater.com/media/ny5nq2vk/yorkshire-water_drought-plan-2022_final_public-april-2022.pdf). The triggers and actions are detailed in the subsections below.

6.1 Triggers

6.1a Trigger: Reservoirs crossed our normal control line

We meet customer demand through use of our licensed water resources, which include reservoir, river, and groundwater supplies. On average regional reservoir stocks fall below normal control line (NCL) for 12 weeks a year, this normally occurs between mid-April and June. When we are below NCL we balance raw water resources by reducing reservoir abstraction and increasing river abstraction, which helps to conserve reservoir stocks.

In 2025 regional reservoir stocks crossed the normal control line on 25th March 2025. As part of our proactive approach to dealing with dry weather we instigated our Bronze Company response early (on the 3rd April) to the developing dry weather situation.

In reaction to this our Water Resources Plan (WRAP) produced on 1st April increased grid production (river supplied water treatment works) to support our reservoir supplied water treatment works (WTWs) with treated water. We actively assess each area weekly and decide which area requires what volume of grid support to balance supply/resources. Each reservoir group and area grouping have different control lines, we use these control lines to effectively balance the drop in each area through use of our strategic raw and treated water links, with the aim to bring each group as close to yield as possible whilst managing the supply to customers.

We also maximised our river abstractions (where the river level allowed) on the Wharfe, Ouse and Ure to support the reservoir groups with raw water, this then allows us to balance the decline in groups through our strategic raw water network.

This strategy has significantly changed our water resources proportions. Average reservoir abstraction in Q1 (Jan-Mar) was 685Ml/d, this reduced to an average of 584Ml/d in Q2 (Apr-Jun). River abstraction has increased from a Q1 average of 437Ml/d to an average of 523Ml/d in Q2. When river levels have increased in Q2 we have been able to maximise abstraction, reducing reservoir use as close to minimum as possible. For example, higher river levels in the first 2 weeks of June allowed us to increased river abstraction to an average of 587Ml/d reducing reservoir abstraction to an average of 487Ml/d. We will continue to maximise river abstraction within licence constraints.

We have also increased leakage focus by escalating a leakage hub, to enable us to minimise leakage and as a result reduce demand, with the team focus ensuring we prioritise any work to repair leaks within district metering areas (DMA) and on trunk mains within the area as quickly as possible.

We have an 'always on' approach to water saving messaging, meaning we proactively push out messaging whatever the weather. Over winter, we've created 14.8m opportunities to see and hear our water saving messaging. All year, free water saving packs are available for customers to order through the Yorkshire Water website. In line with our Drought Plan, when we crossed our normal control line, we activated our dry weather communications plan to ensure we were communicating to customers the importance of saving water during dry weather.

6.1b Trigger: Reservoirs crossed Environment Agency Early Warning trigger line

Regional reservoir stocks reached the Environment Agency early warning trigger on 22nd April 2025 and we initiated weekly discussions with the EA at this time as per our Drought Plan. Taking a continued proactive approach to the situation we also instigated our Silver (escalating from Bronze) incident meetings in line with our Company Incident Management Plan on 22nd April. At this stage, our region was not considered to be in drought, but this trigger ensures we start implementing actions early to lessen the impacts if the situation worsens.

Following our regional reservoir stocks crossing the EA control line our operating strategy continued to be maximising river abstraction and minimising reservoir abstraction. However lower river flows from mid-April onwards reduced the volume of water available for abstraction, the average reservoir use to date in May was 620Ml/d, lower than Q1 average but not as low as would be possible with increased river abstraction.

The prolonged dry weather coupled with multiple heatwaves has resulted in demand spikes with two peaks in April, one peak in May and two peaks in June, and another at the start of July. These demand peaks combined with persist dry weather has resulted in higher average demand in April, May and June.

As outlined in sub-section 6.1a, river abstractions on the River Derwent, River Hull, River Wharfe, River Ouse and River Ure have been maximised, within licence constraints. River levels in April, May and June have been lower than average limiting abstraction on River Wharfe at Arthington, River Ouse at Moor Monkton and River Ure at Kilgram Bridge.

The lower river flows and the higher demand has required higher reservoir abstraction to meet supply.

We have continued the leakage focus including proactive targeted leakage detection on upstream trunk mains to ensure we are in control of any leakage on our trunk main system. DMA focus groups in place identify any areas above our minimum leakage levels, which then allows a targeted approach to locating leaks in specific areas, again with the aim to minimise leakage, demand and therefore abstraction from reservoir group.

Following our Drought Plan, we also enhanced our water conservation activities. We pushed our water saving messages via a range of media and started communications with key stakeholders such as political stakeholders, inset appointees, retailers and new appointments and variations (NAVs).

As this stage we liaised with the EA over the onset of drought walkovers and preliminary permit and order preparation (including in-river works permits where required). It was agreed that a series of walkovers would be carried out to validate and cross reference data collected in 2022.

As part of our Drought Plan, we also sent out letters and emails to our key downstream abstractors and stakeholders to notify them of our dry weather escalation plans and invited them to contact us should they have any concerns, or wished to report any signs of environmental stress.

6.1c Trigger: Reservoir stock predicted to be 10 weeks from crossing the drought control line

The next trigger for implementing drought actions is when regional stocks are predicted to be 10 weeks from the drought control line. According to our Drought Plan we would escalate to Silver at this

stage, but being proactive, we instead escalated to Gold on 12th May. During dry periods we model reservoir stocks against forecasts of a repeat of previous droughts in our region. Modelling was commenced at the start of April; the latest assessment predicted a risk of reservoir stocks reaching the 10 weeks from crossing drought control line (4 weeks before implementing TUBs) on 16th June across Yorkshire Water's area if we had a repeat of the 1995/96 rainfall. Rainfall in April and May has been less than in the same period in 1995. The modelling carried out at the end of April predicted a risk of reservoir stocks reaching the 10-week trigger on 16th June. As the dry weather has persisted more extreme theoretical rainfall-based scenarios, i.e., 40% of the LTA rainfall in June and 60% LTA rainfall thereafter, have been used which showed close resemblance to the 1995/96 pattern. Our latest WRPR forecast using this extreme scenario indicated we have crossed the 10-week trigger on 16th June similar to 1995/96 scenario.

Throughout all this time, we have continued liaising with the Environment Agency on a weekly basis to discuss triggers reached and actions that we have been carrying out. Alongside this, we continued the preparation of environmental assessment reports and drought permit and order applications and also approached Natural England to ensure they were aware of the situation although there are no designated sites under the Conservation of Habitats and Species Regulations 2017 as amended or the Wildlife and Countryside Act which could be impacted by this drought action.

Operationally we took the decision to start implementing some of the actions triggered by stocks being 10 weeks from crossing the drought control line earlier than the trigger date, rather than wait until we reached this trigger. These actions have been outlined in previous sections but are also summarised below:

- From start of April maximising river abstractions for treatment and distribution and pumping to reservoir storage.
- Weekly review to identify reservoir groups with a higher rate of fall than regional average to target treated water or raw water support.
- Use of raw water pumping stations to balance stocks between North and North West Reservoir groups initially with options to transfer water from North West to South West groups as needed.
- Specific actions to protect groups which have experienced low levels in previous droughts, e.g., the Worth Valley and Leighton groups.

In addition to operational changes made we also preparing for TUBs with the following actions:

- This included recreating communication assets such as adverts and notices as well as identifying where they would be best placed to notify customers so they were ready in advance of the announcement that we would be implementing TUBs.
- Reviewing all our in house standard operating procedures for contacts relating to TUBs as well as refreshing all upskill material
- Producing frequently asked questions (FAQs) to support with the management of customer interactions, with clear information given around the environmental impacts and the need for this action.
- Forecast modelling to understand potential increase in customer contacts, so that we're able to effectively resource to support any surge in demand across all our contact centre.
- Setting up of a dedicated TUBs line to direct customers to the right support. As well as increasing our social media opening hours, after reviewing historic data, to better support customers.

- Call to All across the business to pledge support for customer support activity; taking contacts, supporting at water saving events or during operational incidents across the summer, with appropriate upskills in place to support colleagues
- As part of our Drought Plan, we also enacted a plan for enhanced leakage detection through multiple methods in risk areas, that is, increase find and fix, lift and shift logger deployment for generating points of interest. We also directed focus on 'unaccounted for water' in areas with maintained high demand, but in which reported leakage had reduced beyond the levels of which demand had reduced. We switched to targeted detection of unmetered areas, that is, upstream mains with limited metering, and in areas where meters had failed.

We uplifted our water saving campaign and increased our spend on advertising. Our messages changed from green to amber week commencing 5th May and we introduced our TV advert on 17th May which features red messaging. We held weekly broadcast media interviews to keep customers up to date on our water resources position and explained how they could help play their part in reducing water usage. We ramped up the social media posts across our channels (Instagram, Facebook, X and Linked In) to increase the reach of our campaign. We supplemented bills and letters with water saving leaflets, sent text messages to hotspot areas of customers, and sent an email to our customers who have an online account with us. Alongside all this, we provided fortnightly updates to stakeholders including MPs, local authorities, eNGOs, retailers and NAVs.

Alongside our communications plan for managing the ongoing dry weather, we started preparations for implementing TUBs.

We have also initiated the preparation of demand side drought orders to restrict non-essential use (NEUB). This has involved reviewing the UKWIR 2023 Drought Code of Practice on Water Use restrictions and the UKWIR 2025 project on 'Assessing the Costs and Benefits of Non Essential Use Bans – A Feasibility Study', alongside identifying exceptions and FAQs. We have also been working with other water companies to understand best practice, how best to undertake a cost-benefit analysis and how to develop our communications approach.

6.1d Trigger: Reservoir stock predicted to be 8 weeks from crossing the drought control line

The 8-week trigger was initially predicted to be crossed on 7th July, as mentioned above (sub-section 6.1a) this was revised to 30th June, after ongoing dry weather. The extreme theoretical scenarios modelled have shown the 8-week trigger will be breached on 30th June similarly across Yorkshire Water's area.

All the actions outlined when previous triggers have been crossed continue as part of the drought response. In addition, Yorkshire Water moved to impose a TUB on all customers on 11 July 2025. This was widely publicised through the advertising, mainstream media, social media and explained on the Yorkshire Water website. We also provided a dedicated phoneline for customers to get in touch with us if they had any queries.

Yorkshire Water commenced pre-application discussions with the EA, and proactively submitted documentation early for EA review to ensure delays would be mitigated should permit applications need to be formally submitted.

6.2 Operational practice changes

Our operating strategy is to reduce reservoir use to as close to yield as possible by supporting via treated water (grid import) and raw water transfers.

The River Wharfe abstraction is supported by a release from Grimwith Reservoir which is part of the North West Reservoir group. Specific actions we have taken to support the North West are as follows:

- Increased treated water support from the Grid into the North West to minimise output from Chellow Heights WTW where possible, this is dependent on demand, reservoir levels in the rest of the region and grid treatment capacity available.

- Increased raw water support to the North West from the North via Eccup to Graincliffe RPS to allow us to reduce abstraction from the North West. This transfer is used to balance the levels in the North Reservoir Group with levels in the North West. The North Reservoir group can be supported by increased river pumping from Moor Monkton / Wetherby RPS when the river level allows.

- Increased Abstraction from the River Wharfe (river level allowing). Although generally the river level is not currently available for abstraction without full support from Grimwith Reservoir, the system is set up to allow us to utilise the river as and when it becomes available, this enables us to minimise abstraction from Grimwith Reservoir as soon as the opportunity arises.

Worth Valley

We have reduced production at both Sladen Valley WTW and Oldfield WTW by supporting with treated water from Graincliffe WTW, which has enabled us to bring abstraction from the Worth Valley group below yield. There are further actions we can take to reduce demand/abstraction within the Worth Valley, all of which were undertaken in 2022. These alterations require increased abstraction from other North West reservoirs, and therefore need to be balanced with the reservoir levels in those groups. This is reviewed during the weekly water resource planning meeting, which sets the production plan for the week.

Our Drought Plan includes long term options that we will consider if the drought continues into 2026. These options will provide additional resources for public supply and will only be implemented if there is a risk that our current available resources will not be able to meet demand if the drought continues.

The decision to implement long term options will be dependent on the severity of the situation and scenario modelling to assess the potential risk. The trigger in our drought plan is to review the need for long term options if we are six weeks away from our regional drought control line in the second year of a drought. We are currently reviewing the scope of the long-term options and the timescales for delivery. If we were approaching the trigger for implementing long term options, this information will help determine which long-term options we should implement if required.

In line with our drought planning process, once the situation recovers, we will carry out a full review of our drought triggers and actions and their impacts. We will produce a “lessons learnt report” within six months of the situation returning to normal. This will include a review of operations and any opportunities to operate differently to improve our resilience to future droughts.

6.3 Conserving supplies

Since crossing the NCL in March 2025 we have Increased our leakage activity within DMAs and on trunk mains. As per section 9.1, leakage has been reduced by 7.46Ml/d, we will continue with the increased leakage focus with the aim to drive leakage as low as possible, reducing demand and as a result abstraction from the reservoirs.

Actions carried out in sections 6.1 to 6.3 have collectively reduced abstraction from regional reservoirs conserving customer supplies where possible.

7. Customer engagement

Our Communications Team activated our dry weather communications plan in early April to explain to our customers about why it is important to save water during dry weather. As part of our dry weather plan, we have a RAG approach to messaging which allows us to be flexible with our campaign and target the messaging so it lands with our customers. We started our 'green' adverts in early April across radio, paid social media, digital and out of home. Alongside the advertising campaign, we communicated with our stakeholders, colleagues, retailers and NAVs to encourage them to share our water saving messaging as well as raising awareness of the developing drought situation, provided an update on water resources and promoted customer side leak reduction advice. This was in addition to media and organic social media activity to support our key messages.

As the dry weather escalated, our messaging switched to 'amber' on 5th May. This was enhanced with a significant uplift in advertising spend. We have fortnightly updates for stakeholders, retailers, NAVs, Local Resilience Forums (LRFs) and river health partners. We also have undertaken a number of broadcast interviews with media, as well as utilising as many touchpoints as possible to remind customers about the importance of saving water, including our website homepage, the hold message on our customer helpline, customer letters and text messages to customers in hotspot areas. We have customer events taking place between May and August to talk to customers face to face about the importance of saving water. Our 'red' messaging was live from 17th May with our TV advert being shown. We are sharing our reservoir levels with customers on a weekly basis on social media so they can see the impact the continued dry weather is having. We will continue to raise awareness of our key messages to help customers understand why they need to use water carefully at this time of the year and provide them with behavioural nudges to make changes.

The weather (temperature and rainfall) has a particularly strong relationship with customer demand making it hard to prove any changes in demand is directly linked to communication campaigns.

Based on a few sources of information, there are some estimates available for assumed demand reduction from communications activity including London Economics' White Paper 2018 and UKWIR's 'Review of 2022 Drought Demand Management Measures – Main Report'. The London Economic White Paper states a range of measured effects of 'messaging' between 1 and 4.8% in the short term. The UKWIR review of the demand drought measures in 2022 concluded that quantitative effect of communication campaigns is difficult to determine analytically because the nature of campaigns is more subtle than TUBs (which have a clear on – off nature) and the campaigns are delivered in a continuous manner from 'background activity' to more 'explicit calls for restraint via a diverse range of media'. The UKWIR study concluded that extensive modelling undertaken did show a reduction in

consumption of an average of 0.58%. However, it was noted that 'however the standard deviation of these savings is 1.14%, indicating that this result is small and highly uncertain'.

When we announced TUBs, we utilised all our communication channels to let customers know about the upcoming restrictions. These included all our advertising channels, substantive information on our website detailing the restrictions, legal notices, social media, traditional media including over 10 broadcast interviews taking place, an email to customers, updating our marketing channels, stakeholder updates and briefings, as well a detailed webinar with NAVs.

8. Implementation of a TUB

In our drought plan, a TUB needs to be in place before a drought permit or order application is made between the 1 April and 1 October. A TUB also needs to be in place long enough to show if it has had a measurable impact on our demand. Throughout spring, we have continually modelled and monitored our water resources situation, including estimates of the projected dates that temporary use ban (TUBs) and drought permit triggers could be crossed.

The potential threat to water supplies is a direct result of the weather conditions throughout February to June 2025. The threat will occur if the conditions continue to be dry, or if we experience a prolonged period of high demand. We have acted in line with our drought plan triggers, preparing for a TUB in the spring when models suggested they would be required, and implementing a TUB, in line with our drought plan and model forecasts,

In order to better reflect the dry condition, we are experiencing this year and to be prepared for more adverse condition than 1995 and 2022, we have been exploring and evaluating additional 'extreme scenarios' in our weekly WRPR forecast. One such extreme scenario assumes 40% LTA rainfall in June and 60% LTA rainfall thereafter. Our recent assessments showed that under this extreme scenario as well as the 1995 scenario, Yorkshire Water would impose a TUB on all customers on 11 July 2025.

We are using several ways of tracking the impact of the TUB on demand reduction, we have an unmeasured household sample known as the Domestic Consumption Monitor (DCM) and measured household consumption from our newly deployed Advanced Metering Infrastructure (AMI) smart meters that provide more real-time data that can be used to track the impact.

Both data sets can be used to determine the saving from implementing a TUB for both unmeasured and measured households and will enable us to identify if the impact varies dependent on how the customer is billed.

The customers on the DCM sample, circa 1000 unmeasured customers, still pay a ratable value bill but have had a meter installed so we can obtain consumption data which is then scaled to represent total unmeasured household consumption in Yorkshire used in our per capita consumption (PCC) calculations.

The graph below shows a comparison of the total daily average consumption from the customers on the DCM sample in 2022 when we also introduced a TUB. The graph also shows details of the pre and post average consumption for this sample demonstrating the impact of the TUB on demand reduction.

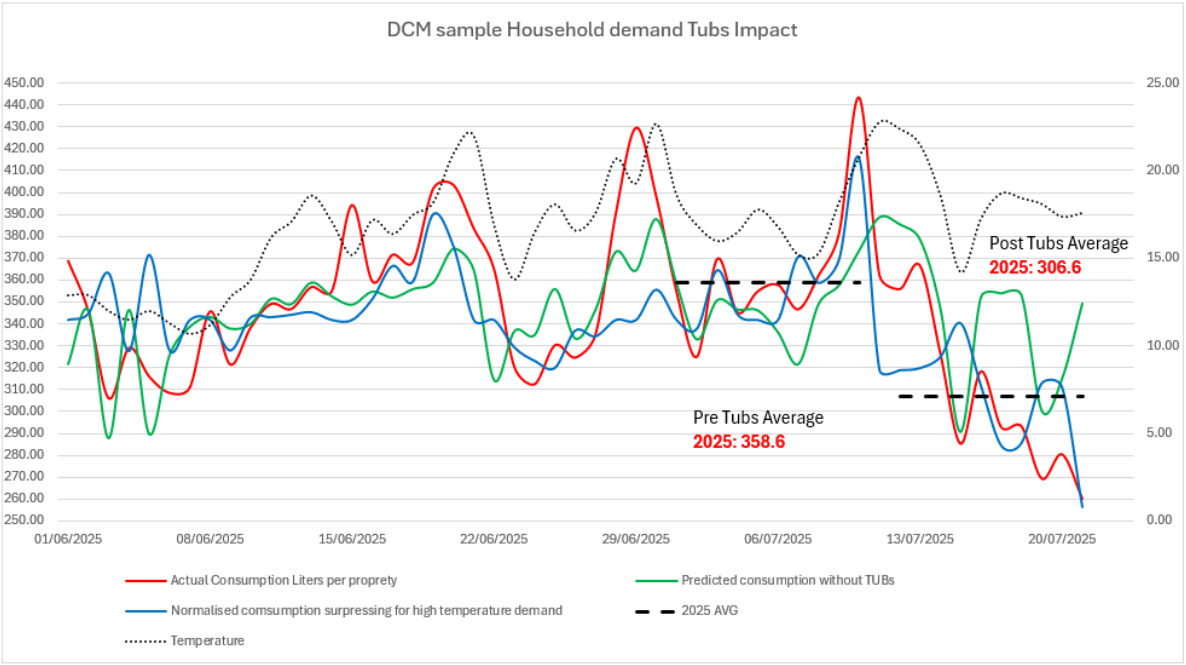


Figure 9: Profile of unmeasured household consumption from the domestic consumption monitor in 2022 and 2025 to see the impact of the temporary use restriction

You can see from the graph that unmeasured household daily consumption from the DCM sample shows that the pre-TUBs average PHC consumption was 358.6 l/day per property and since implementation of the TUB, average PHC consumption has dropped by 51.9 l/day per property to 306.6 l/day per property.

In addition to the DCM sample, we commenced our AMI installation on Yorkshire Water customers in 2024 and all new developments and DMO customers received an AMI meter. The AMI sample includes circa 120,000 customers where we have deployed smart meters across Yorkshire to date which transmit daily data and enables us to notify customers of continuous flows to help reduce leakage and provides granular consumption data that can be used to understand when and how much water our customers use each day.

The graph below shows the comparison of the total daily average consumption, the predicted consumption based on the temperature and rainfall and the normalised consumption that is actual consumption adjusted to remove the weather effect and weekends. These trends have been calculated from the AMI metered customers. There are also details of the pre and post average consumption for this sample which can be used to understand the impact of the TUB on demand reduction.

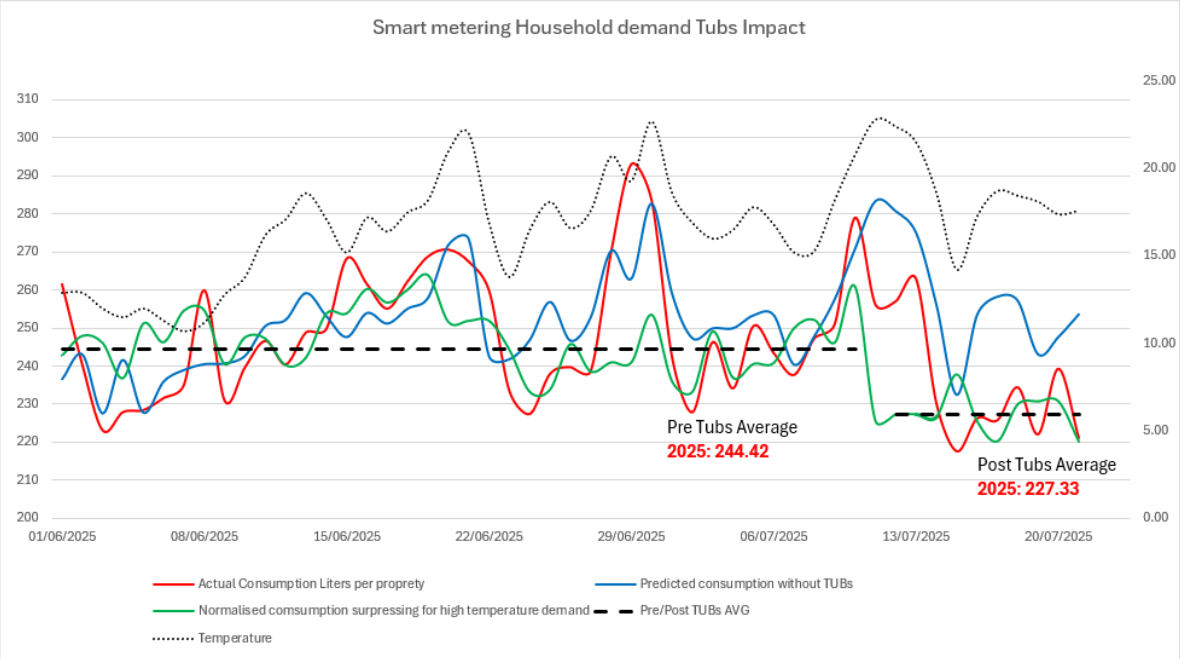


Figure 10: Profile of measured household consumption from the AMI in June and July 2025 to see the impact of the temporary use restriction

You can see from the graph that metered household consumption from the AMI data shows that the pre-TUBs average PHC consumption was 246.82 l/d per property and since implementation of the TUB average PHC consumption has dropped by 17.92 l/d per property to 227.33 l/d per property.

In addition to these two methods, we have also reviewed regional daily demand both as a daily average and across the diurnal demand profile. Both these methods to can be used to determine the saving from implementing a TUB, helping us assess the impact at a regional level.

The chart below shows the diurnal demand profile for a sample of 25% of Yorkshire Water's supply aggregated to create a regional demand total on 11th July (1st day TUB was in force) compared to 20th June. The weather conditions on both days were very similar with very high temperatures, no rainfall and both were Fridays when the demand profile is slightly different to other weekdays.

The chart clearly shows the reduction in use during the day with a significant reduction in evening demand. This reduction equates to 78Ml/d or a 5.5% reduction in total demand. The reduction when leakage and commercial demand is removed from total demand shows an approximately 10% reduction in domestic demand.

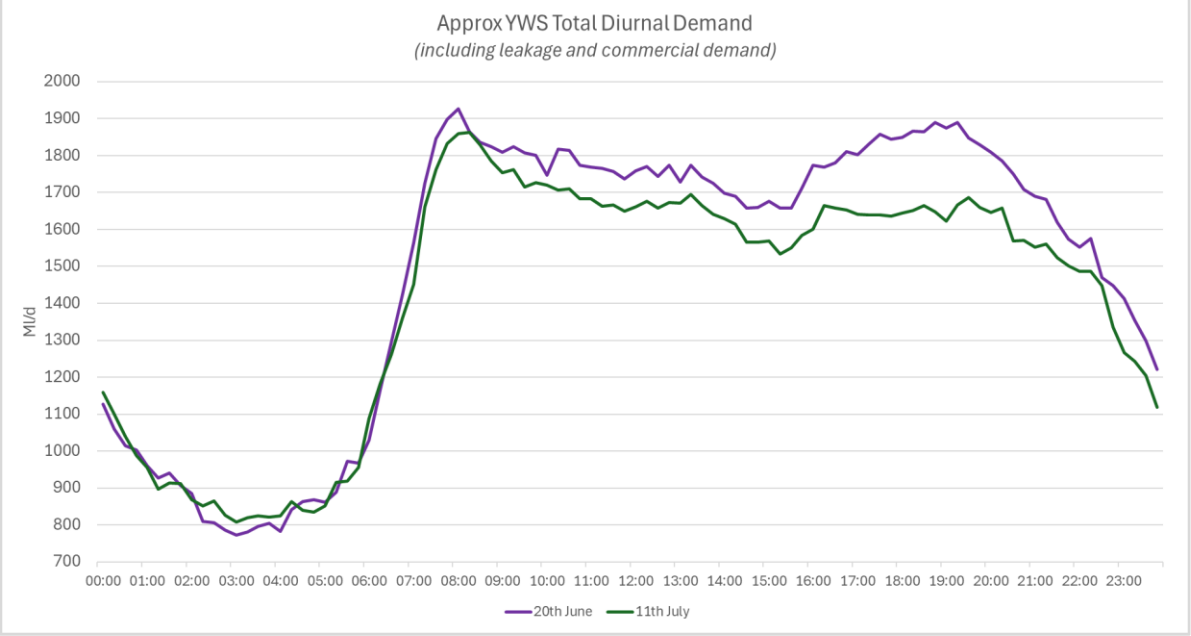


Figure 11: Profile of YWS approximate total diurnal demand pre and post implementation of the temporary use restriction

The chart below shows the daily demand before and after the implementation of the TUB. It compares the actual daily demand with the predicted demand based on weather conditions using June 2025 demands as the benchmark. This chart shows a 5% reduction in demand in dry weather when temperatures were 25C or above. This reduction when leakage and commercial demand is accounted for is approximately 9%. The impact of the TUB reduced when the temperatures were lower was reduced to approximately 3% of total demand or 5% when leakage and commercial use

was accounted for. Interestingly a reduction was still seen on Tuesday 15th July when there was between 10-25mm of rainfall across the region.

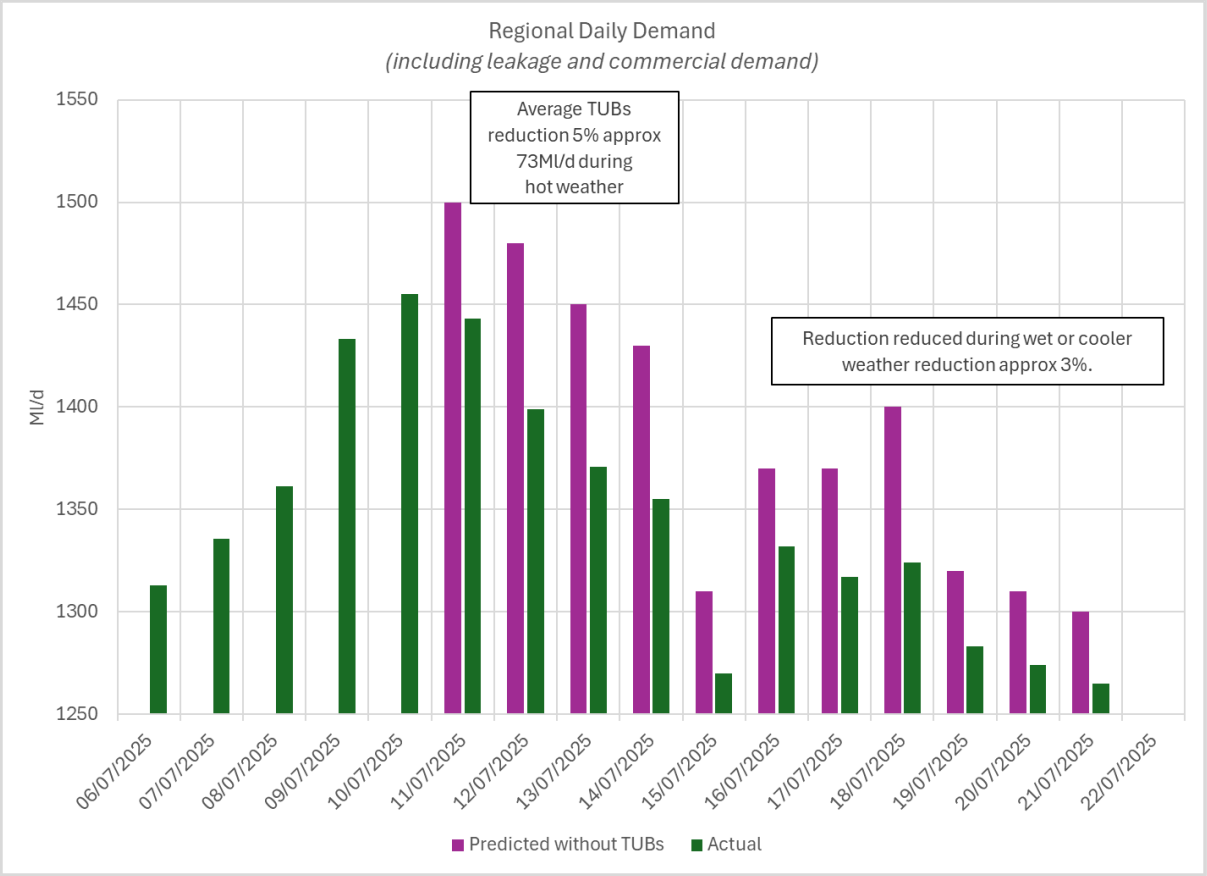


Figure 12: Regional daily demand including leakage and commercial demand actual verses predicted without TUBs

We can see from the measures of tracking demand reduction above that the introduction of the TUB, decreased temperatures and rainfall has resulted in a regional demand reduction in Yorkshire. There was an immediate and sustained reduction in demand following the intervention. Both the bottom-up (using available data for DCM and AMI samples) and top-down (regional DI) calculations align, showing a total impact of 70.1 Ml/d and 78 Ml/d respectively, which equates to approximately a 10% reduction in household demand. This suggests that the observed impact is largely driven by changes in household customer behaviour and the impact of TUBs on water consumption is more significant for unmetered customers compared to metered ones.

9. Enhanced leakage control

9.1 Leakage reduction

Since crossing the NCL we have increased leakage resources regionally this includes an accelerated planned increase in leakage inspector headcount of 100 (full time equivalent staff) FTE and an increase in overtime via evening and weekend working for customer reported leaks, proactive leakage and repair gangs. We have delivered a reduction of 17.65 Ml/d from late March to the start of

June in these areas. Leakage in this area is 11.32Ml/d less than in the period April - June 2022 as shown in
Table 2.

Table 2: Reported leakage level in each Forecasting Zone; March and start of June 25, and compared to the levels in June 2022

Forecasting Zone (Ml/d)	March	April	May	June	April - June 2022
Bradford	26.2	24.96	23.47	21.14	29.3
Calder	42.5	37.64	37.17	34.11	37.66
Leeds	20.64	20.28	19.25	18.84	22.26
Wakefield	10.42	9.41	8.43	8.02	9.68
Total	99.76	92.29	88.32	82.11	98.9

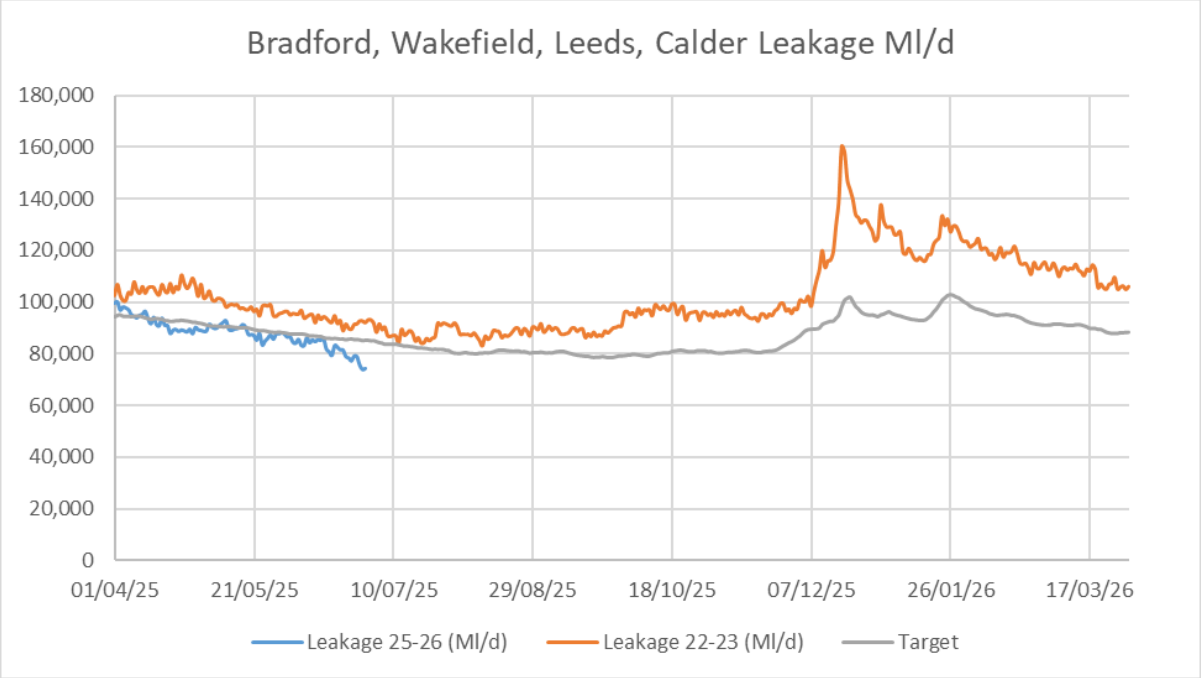


Figure 13: Leakage target profiles: Leakage in Bradford, Leeds, Calder and Leeds Forecasting Zones compared to 22-23 and the target

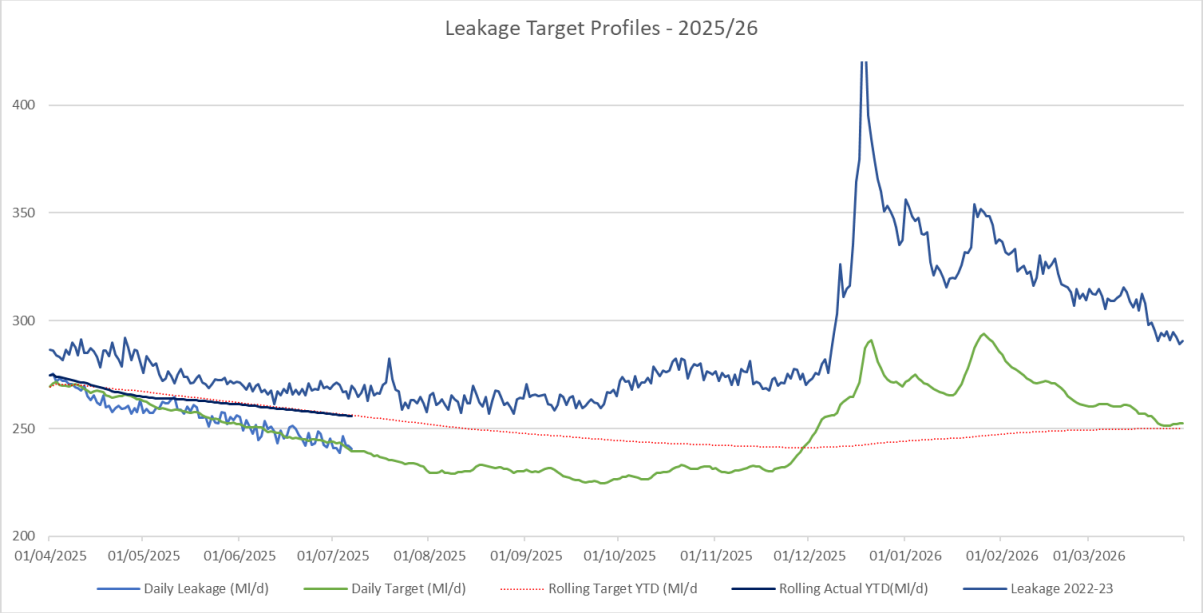


Figure 14: Leakage target profiles: Regionally leakage is 240 Ml/d this is on target and 29.32 ML/d below levels in 2022-23 when we last experienced dry weather conditions

9.2 Increase in leakage resources

Overall leakage resources across Yorkshire have increased by 100 full time equivalent (FTE) staff since April this year. The majority of these resources are part of teams which are regionally based, these include customer side leakage, nightwork teams, upstream teams and a team which lift and shift acoustic loggers. Since crossing the NCL we have been able to shift these resources from being spread evenly across the region based on levels of leakage to being focused on the areas where water resources are more stretched. We have started evening and weekend working to increase the volume of leak detection in the area. Additional activities over and above 'business as usual' (BAU) as summarised below.

Team	**Total house Overtime (up to End June)**
Upstream & Raw Water	198.4
DMA Leakage	204.7
Customer Leakage Team	74
Logging	74
Total	**551.10**

Upstream and Unaccounted for Water investigations

- Targeted Upstream (trunk main) proactive leakage detection surveys in all impacted trunk mains systems. These areas have been prioritised whereas during previous years they would have only been surveyed as part of an annual cyclical survey.

- Proactive and targeted leakage detection surveys carried out by the Upstream Leakage Team in the small number of unmetered or non-reporting district metered areas (DMAs).

- Service reservoirs, pumping stations and water treatment work sites have been proactively inspected for leakage. This includes overflows and assets within the site grounds such as valves, meters and hydrants.

- Raw water investigations are being carried out in the Bradford systems. This survey work involves physically walking the length of the raw water mains to check for visible losses as well as physical asset checks on all available fittings. Similarly to upstream (trunk main) leakage, this is an area that would have been surveyed as part of an annual cyclical survey, but given the current position, it has now been prioritised.

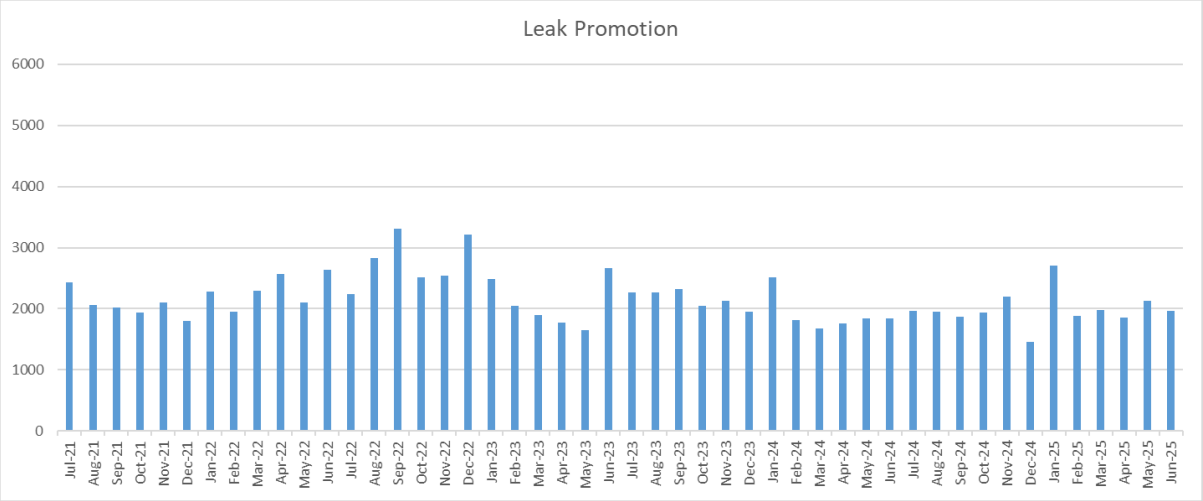
FCZ	Type	Number completed	Status	Total length of all systems searched - km	Jobs promoted	Non infrastructure assets investigated
Bradford	Trunk	4	Complete	129.83	6	6
Bradford	Non-Opp DMA	8	Complete	58	18	
Bradford	Trunk	9	Complete	68.6	3	20
Bradford	Non-Opp DMA	9	Complete	46.5	14	
Calder	Trunk	1	Complete	21	1	4
Calder	Non-Opp DMA	2	Complete	10.17	1	
Leeds	Trunk	0	Complete	32.4	3	2

We have moved our resource of teams lift and shifting logger to focus on these areas this is over and above BAU activity, this has been resourced as additional work on evening and weekends.

Activity	Areas	Number Of DMAs	Loggers Deployed
Lift & Shift	Upstream Bradford	1	60
Lift & Shift	Bradford	8	420
Lift & Shift	Upstream Calder	1	50
Lift & Shift	Leeds	11	610
Lift & Shift	Calder	17	930
Lift & Shift	Wakefield	9	510
Total		47	2580

9.3 Find & fix rate

Promotion of leaks through to our R&M Service Partner M Group for repair is higher this year. The graph below shows regional monthly promotion. Promotion in May has been higher than the same month over the previous years. Hundreds of extra leaks have been promoted from April to June compared to the same time last year.



9.4 Underground supply pipe leakage (USPL) & fix rates

Specialist customer side leakage technicians are working additional hours on a weekend and mid-week to attend high priority / volume leaks on customer owned pipes. So far since April we have worked an additional 74 hours locating leaks on customers private pipes.

More than 5,000 additional customer meters have been read to proactively generate more proven continuous flow (leaks) which are being and prioritised for a fix via our service partner.

We have identified and visited 25 commercial users across the catchment with significant water consumption, e.g., farms, industrial, schools, prisons, and hospitals with 'unusual' consumption profiles to confirm leaks and manage expectations to fix at the earliest opportunity. We are also visiting all our concessionary supplied properties.

We are proactively assisting commercial users via the retailer Business Stream with higher than usual bills and continuous flow but not 24-hour users. We have attended 15 and will continue to offer proactive support that is not been provided by the retailer to reduce leak life and demand.

A recent recruitment drive has increased our Yorkshire Water's team of specialist customer side leakage technicians by an additional 13 FTE across the region this includes 5 FTE in this area.

9.5 Public awareness campaigns on leakage reporting

We know customers rightly challenge our leakage performance particularly during dry weather so we made sure talking about Yorkshire Water's action was a clear part of our communications plan. We issued press releases and social media posts explaining the £16m investment Yorkshire Water is making into reducing leakage over the next year, including recruitment of additional leakage inspectors, alongside a call to action for customers to report any leaks they find to us as quickly as possible.

9.6 Leakage performance improvement plans

We are continuing with the enhanced leakage reduction in our hotspot areas, whilst not impacting on the region wide leakage reduction plan for Yorkshire. The additional focus areas have already been detailed in the various sections above, and include but not limited to:

- Operational leakage detection overtime – evenings and weekends
- Increase intensity of find and fix activity – promote and repair more
- 'Lift and Shift' logger deployment to generate point of interest for leakage investigation
- Additional meter reads to identify leaks on customer props ahead of current meter read cycle
- Focus on abnormal demand at large business customers
- Escalating optimisation schemes at DMA level, that is, meter replacement, DMA sizing etc
- Leak detection on raw water mains and investigation into any leaks at Yorkshire Water's assets
- Pressure management solutions to reduce background leakage
- Resolving 'demand' - both consumption and leakage on concessionary supplies
- Plan to overachieve reduction in area

10. Outage management

10.1 Outage data

As described in Section 6 we meet customer demand through use of our licensed water resources, which include reservoir, river, and groundwater supplies. In the North West group when the level drops below Normal Control Line (NCL) in individual reservoirs or reservoir groups we reduce abstraction by either importing raw water or treated water to meet supply.

The treated water import is from our grid network which originates at Elvington WTW and Loftsome Bridge WTW, both of which abstract water from the River Derwent. The grid water is imported into the area the North West reservoir group supplies through a series of trunk mains and pumping stations. An outage at any of these assets will have an impact on North West reservoir stocks.

Since the start of the dry weather, there has been an outage of 29.4Ml/d at Loftsome Bridge WTW. Proportionally, this outage has reduced the grid import to the North West supply area by an average of 13Ml/d total. This comprises of 8Ml/d support to Gawthorpe and 5Ml/d support to Staincliffe.

Outage data for Loftsome Bridge WTW is a mixture of both planned and unplanned outages and linked to the performance of rapid gravity filters and granular activated carbon units on site. Issues identified with the floor and coating of the filters has impacted performance and as a direct result, several units have been removed from service to facilitate required lengthy renewal works to be carried out on those units.

10.2 Sources impacted by outage

The sources impacted by the outage are the reservoirs that supply all the WTW in the North West area which are as follows:

- Nidd Barden Group
- Thornton Moor and Stubden reservoirs
- Grimwith Reservoir
- Worth Valley Group
- Embsay Reservoir
- Rombalds Group

The 13Ml/d reduction in grid import because of the Loftsome Bridge WTW outage, has resulted in the North West group stocks being 2.5% lower at the end of June, assuming the import would have been in place throughout April, May and June.

10.3 Outage impact

As stated in sections 10.1 and 10.2, the impact of this outage is that we have been unable to support the North West with a further 13Ml/d of grid water, as a result North West reservoir stocks would have been 2.5% higher at the end of June.

To resolve this outage, work on filter refurbishment on the Loftsome Bridge WTW site has been accelerated. We had reviewed the number of teams working on the issues and the working hours accordingly. We have looked at alternative options to increase the flow from Loftsome Bridge WTW but unfortunately due to lead times and / or issues with compliance with Regulation 31, we were unable to source temporary units. The acceleration of the refurbishment works has meant we have been able to resolve the outage and increase Loftsome Bridge WTW output to pre-outage capacity.

10.4 Resource Impact

As stated in previous sections, the reduced output from Loftsome Bridge has prevented us from supporting the North West as we would have liked. Since crossing the NCL we could have supported the North West with on average 13Ml/d of treated water. Without this increased support it means we have had to increase production from WTW in the North West area and therefore abstraction from the reservoirs supplying these WTW, as stated in section 10.2 these are:

- Nidd Barden Group
- Thornton Moor and Stubden reservoirs
- Grimwith Reservoir
- Worth Valley Group
- Embsay Reservoir
- Rombalds Group

11. Copy of the notices and advertisements required under paragraph 1 of Schedule 8 to the WRA 1991

As required under paragraph 1 of Schedule 8 to the WRA 1991, written notice of the River Wharfe Drought Permit applications will be sent to third parties with an interest in the sites. These include;

- Local authorities responsible for areas affected by the permit;
- Leeds District Council and North Yorkshire Unitary Authority (Arthington)
- North Yorkshire Unitary Authority and Bradford District Council (Lobwood)
- Other abstractors operating in the areas affected by the permit.
- Local rivers trusts and wildlife groups.
- Local angling clubs in the areas affected by the permits if granted.
- Members of the Wharfe Anglers Associations.
- Local wildlife sites
- Canal and River Trust

The notice provides information on where the full application can be inspected free of charge for a period of seven days from the date of formal submission (Friday 25th July 2025). A copy of the notice is provided in Appendix 2.

The notice will be advertised on Thursday 24th July 2025 in the Yorkshire Post, Ilkley Gazette, and Wharfedale Observer, which are circulated in the area potentially affected if the permits are granted, and in the London Gazette, in accordance with Environment Agency guidance. If the applications are successful, we will provide notice the permits have been granted in the same newspapers.

A Yorkshire Water webpage has been created (www.yorkshirewater.com/drought-permits/) to provide information on drought permit applications, including copies of all supporting documents. Further permit application notices will be added on the dates we apply. The webpage includes information to explain why we are making the applications and a list of frequently asked questions.

Objections can be made by Friday 1st August 2025.

12. Public inspection arrangements

Documents relating to the River Wharfe at Lobwood drought permit application will be made available, free of charge, for inspection by any interested parties from the date it is advertised.

The documents include a copy of the drought permit application and supporting information including environmental reports and will be made available at the following locations and on the Yorkshire Water website:

- Yorkshire Water, Western House, Halifax Road, Bradford, BD6 2SZ.
- Bolton Abbey Post Office, High Street, Bolton Abbey, Skipton, BD23 6EX
- Pool-In-Wharfedale Post Office, Main Street, Pool-In-Wharfedale, Otley, LS21 1LH
- Environment Agency, Lateral, 8 City Walk, Leeds, LS11 9AT.

The Environment Agency guidelines state drought permits must be advertised at the water company's head office and the office most local to the relevant area. We have water treatment works nearby the permit application sites however, they are not suitable for public access, and we are therefore only able to provide the information at our head office in Bradford, which can be accessed by the public.

Objections can be made by Friday 1st August

13. Environmental report

During the preparation of our Drought Plan 2022, a 'shelf copy' Environmental Assessment Report (EAR) was produced for each supply side drought option or group of options. The EAR provides an independent and robust assessment of the potential environmental effects of the implementation of our drought options.

The environmental assessment was conducted in accordance with Government regulations and using the Environment Agency's 2020 Drought Plan Guideline (DPG) and the Environment Agency's July 2020 'Environmental Assessment for Water Company Drought Plans- supplementary guidance', and comprised the following components:

- an assessment of the likely changes in hydrology (flow/level regime) due to implementing the proposed drought options;
- identification of the key environmental features that are sensitive to these changes and an assessment of the likely impacts on these features;
- identification of mitigation that may be required to prevent or reduce impacts on sensitive features; and
- recommendations for baseline, in-drought and post-drought order monitoring requirements.

The environmental assessment focuses on the potential changes to water availability (levels and flows) and any consequent implications for geomorphology, water quality, ecology and other relevant environmental receptors, for example, landscape, navigation, recreation and heritage. Cumulative impacts with other drought options are also considered.

The assessments undertaken confirm the features requiring consideration of monitoring and mitigation; which are provided in full in the Environmental Monitoring Plan (EMP).

Throughout the environmental assessment process, we have proactively engaged key stakeholders, including the Environment Agency and Natural England.

During the prolonged dry weather, dialogue was initiated with the Environment Agency and consultants were instructed to prepare 'application-ready' EARs and undertake the onset of drought walkovers. The application ready EAR, and EMP, are provided alongside this drought permit application, and have been updated in line with new DPG2025.

14. Other options considered

Alongside the leakage and outage management activities we have mentioned in sections 9 and 10 above, we are accelerating capital schemes and maintenance activity to minimise outage across the grid zone to maximise water availability, protect reservoir stocks and reduce demand.

If the permits are granted, we will be able to manage our system in a more resilient way, balancing stocks between areas across Yorkshire. If the permits are not granted (or the decision to grant them occurs too late for us to manage supplies as if it were granted), we will have to operate according to the current licence conditions, and this may result in substantial overdrawing of reservoirs. This will significantly increase the risk of entering winter with the reservoir stocks below the drought control

line throughout the north west area. In respect of specific hotspots (the Worth Valley), there is also heightened risk in that public water supply could be impacted due to the higher rate of decline of stocks in this area. Additional mitigation measures are being developed to reduce the risk of this situation materialising, though these measures alone, without this and other permits, will not mitigate this risk to the public water supply, if the drought conditions persist in line with the 'updated extreme scenario'. This scenario assumes 40% LTA rainfall in June and 60% LTA rainfall thereafter which better reflects the current conditions.

15. Consultees

15.1 Environment Agency

We initiated the formal dry-weather governance meetings with our local Environment Agency in April following reservoirs stocks crossing the Environment Agency early warning trigger line. We have continued to consult and engage weekly with the Environment Agency on the drought situation as it has escalated. We will continue to meet regularly until the situation recovers.

15.2 Natural England

Natural England were consulted throughout the process of writing our Drought Plan 2022. If there is potential for a proposed drought permit to impact on a designated area, we are required to consult Natural England prior to submitting the application. The environmental assessment of this drought option confirmed there would be no impacts on any designated sites. The results of the assessment can be found in the accompanying EAR.

15.3 Local Rivers Trust & Wildlife Trusts

The environmental assessment of this drought option confirmed there would be no moderate or major impacts on any Local Wildlife Sites. However, there could be a minor impact to the River Wharfe, Otley & Mid Wharfedale / Wetherby LWS. The results of the assessment can be found in the accompanying EAR.

15.4 Navigation Authority Consent

The Canal and Rivers Trust have been notified of this drought permit application, although it does not impact on an inland navigation.

15.5 Internal Drainage Board

We have notified the relevant Internal Drainage Boards of our intention to submit drought permit applications. We have been giving fortnightly updates since week commencing 28th April about our water resources position.

15.6 Retailers

An email was issued to all active in-area retailers on 24th April and 2nd May raising awareness of developing drought and providing advice on water efficiency and customer side leak reduction. The Retailer-Wholesaler Group (RWG) hosted a drought webinar for retailer contract managers on 28th May outlining the current situation nationally, with updates from all wholesalers. Further web events will be hosted monthly, with a fortnightly update email to retailers advising of any additional communications in the meantime.

A webinar was hosted on Friday 4th July providing advance notice of Yorkshire Water's intention to impose a TUB. Those who have returned a completed assurance statement have received a slide pack with all information relating to the TUB and timeframes along with detailed FAQs. Those who didn't attend the webinar have been contacted separately by phone or email with the same information.

15.7 NAVs

We have notified all active in-area new appointments and variations (NAVs) on 24th April, and thereafter fortnightly, raising awareness of current water resource status developing drought and providing advice on water efficiency and customer side leak reduction. A meeting was held on 19th May with all NAVs and three other water companies (United Utilities, Southern Water and Severn Trent) to raise awareness of the drought situation and to drive closer co-ordination and collaboration of drought communications across water company areas. A further preparation webinar was held with NAVs on 30th May, co-hosted by Yorkshire Water and United Utilities.

A webinar was hosted on Thursday 3rd July providing full updates to NAVs including our intention to impose a TUB. All NAVs have returned a completed assurance statement post webinar have received the slide pack, HH FAQ document, a TUB information leaflet which can be dual branded, a copy of the legal notice we are publishing along with the list of publications and a formal legal notice send to the Company Secretary for each respective NAV.

16. Objections

No objections have been raised to date.

17. Appendices

Appendix 1: Copies of existing abstraction licences, statutory instruments or Local Acts governing the abstraction, or discharge of compensation water relating to the permit

Appendix 2: Copies of the notices and advertisements required under paragraph 1 of Schedule 8 to the WRA 1991.

Copies of both served and published notices should be sent as quickly as possible to the Environment Agency

Appendix 3: Draft Drought Permits