River Test Stage 0.1 Drought Order Application

1.3 Exceptional Shortage of Rain Case

18th July 2025

WATER for LIFE

from Southern Water

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1 Introduction

1.1 Purpose

Spring 2025 ranks as the sixth driest spring since 1836 (Met Office, 2025) and the Environment Agency has declared that Hampshire has moved into prolonged dry weather status as of 11th July 2025. The significant shortage of rainfall across the South East in this period has led to an increased strain on water resources. Southern Water are applying for a Stage 0.1 Drought Order for the River Test to enable further abstraction and safeguard the supply network in case of further dry weather into the summer and autumn of 2025. This document provides a summary of the Exceptional Shortage of Rain (ESOR) assessment completed by Southern Water, following the guidance provided by the Environment Agency as set out in the Hydrological Guidance for the Assessment of an ESOR (Environment Agency, 2025). It includes the analysis of rainfall, as well as other indicators such as river flows and soil moisture deficits and provides background context with a summary of the observed weather in 2025 to date and rainfall forecasts for the next 15 days.

1.2 Background

Flows within the River Test are maintained by the underlying chalk aquifer, predominantly located within the Test Upper and Middle operational catchments, and several ephemeral tributaries. Testwood Water Treatment Works (WTW) is fed solely from the River Test surface water abstraction under licence 11/42/18.16/546 just upstream of the confluence with the River Blackwater, supplying an approximate population of 165,000 people as part of the Hampshire Southampton West Water Source Zone (Figure 1). There is very little additional storage capacity at Testwood WTW, with Little Testwood Lake able to provide approximately three days of supply (dependent on water quality) in the event of a supply interruption. There are no additional surface water reservoirs within the catchment.

Under the S20 Agreement, there are some special provisions for the ESOR case for the River Test Drought Permit:

- The Environment Agency hydrological guidance for the assessment of an Exceptional Shortage of Rain (ESOR) (Environment Agency, 2025) does not stipulate what the evidential basis for an ESOR test is.
- The Environment Agency will accept a Test Surface Water Drought Permit application for substantive consideration where the ESOR case, at the stage the application is made, is based on actual rainfall, up to the point of application, plus rainfall forecasts in line with the threat to supply forecast.
- If there are no objections to the application, the Agency will postpose determination of the drought permit application until the Company provides updated ESOR evidence that is based on actual rainfall, rather than rainfall forecasts, unless otherwise agreed by the parties.
- If a hearing is required on ESOR matters, the company will provide objector(s) with its updated ESOR evidence based on actual rainfall rather than rainfall forecasts. The reconvened hearing will open not less than four (4) working dates from the data of the provision of the updated ESOR evidence.

Southern Water has assessed rainfall over the past few years across Southern Water's River Test catchment area, including relative to long term average (LTA) statistics. The period has been characterised by below average rainfall between March and June 2025. Forecast rainfall has also been considered in line with the threat to supply forecast.

A fundamental reason for the S20 was the recognition that the need for the River Test Drought Permit could arise frequently until Southern Water is able to implement new supply resources. The current lack of surface water storage options within the catchment mean that Southern Water are reliant on drought permits/orders to maintain supplies even in moderate droughts until a long-term water resource solution is in place for Hampshire. As a result, a drought situation could occur within the River Test area when the shortage of rain may not be as exceptional as might normally be the case for a Drought Order. Therefore, the S20 allows for forecasts scenarios to be part of the case made for ESoR as a supporting factor.

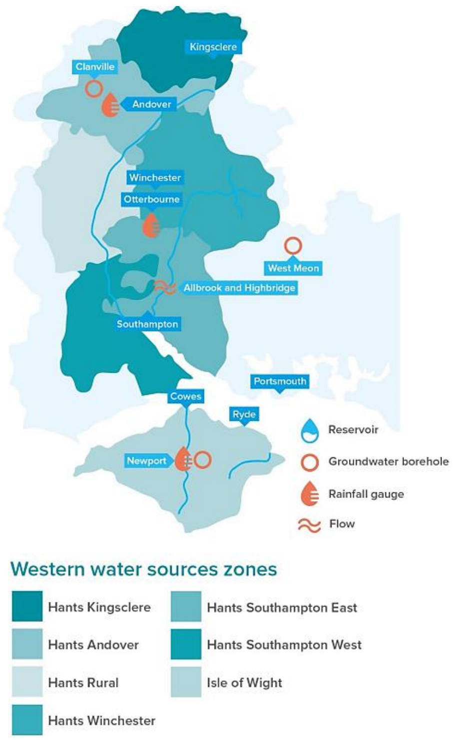

Figure 1: A map of Southern Water's western supply area, encompassing the River Test supply at Southampton.

2 ESOR Assessment Methodology

2.1 Approach

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This ESOR assessment, in support of the Stage 0.1 River Test Drought Order, has been conducted using the hydrological guidance for the assessment of an Exceptional Shortage of Rain (ESOR), May 2025 (version 2.2) from the Environment Agency.

A range of rainfall and other climatic metrics, including rainfall and flow forecasts, have been analysed and presented as part of this ESOR case. These metrics describe the development of the drought, the severity of the cumulative position, and the current ranking of the drought event.

It should be noted that groundwater level has not been reviewed within this ESOR, as the groundwater level recorded at Clanville Lodge has been categorised as either Exceptionally High or Notably High since January 2025 and is currently categorised as Normal levels. Therefore, taking into account that Southern Water's abstraction at Testwood has been within the usual licence conditions, this highlights that the main factor affecting flow within the River Test is rainfall.

2.2 Geographical extent

The geographical extent of all analyses undertaken within this report is derived from the Environment Agency's defined hydrological areas. Due to the location of the required Drought Order for the River Test, two hydrological areas have been used for analysis; River Test (TPD_SE_H23) and Hampshire Tertiaries (TPD_SE_H34). The Hampshire Tertiaries hydrological area has been included to represent the area overlapping with the River Blackwater, which is included within the Total Test Flow (TTF) calculations via the Ower and M27 TV1 gauging stations. By using these areas, it is in alignment with the relationship of the River Test Drought Order and the Environment Agency's Hydrological Catchment Rainfall Series.

2.3 Period of analysis

As shown by the rainfall data within this assessment, March 2025 was the first month in 2025 that both the River Test and Hampshire Tertiaries hydrological areas received less than average rainfall. Therefore, the main period of focus within this ESOR assessment is a five-month period between March 2025 and July 2025 (based on data availability). As this report is being submitted in mid-July, a 15-day forecast data has been obtained from Hydromaster (https://www.hydromaster.com/en/) for the Fullerton and Millbrook station areas which overlap with the River Test and Hampshire Tertiaries hydrological areas for some of the analyses presented within this report to combine recent actual observational data from the beginning of July with this forecasted data. This has allowed Southern Water to include data up until the 29th July in the ESOR analyses.

An LTA of 1991-2020 has been used to ensure a large span of analysis for comparative assessments. Where possible, a longer record of historic data has been analysed for flow and groundwater level data to describe subsequent periods of wetter and drier than average conditions and to minimise associated uncertainties when comparing this period of drier than average conditions to previous historical droughts.

2.4 Rainfall data

Rainfall monitoring is a key component for the development of drought triggers, with a suite of rainfall triggers used to monitor the development of drought (as mentioned within Annex 1 of the 2019 Drought Plan or DP19 (Southern Water, 2019)). The rainfall data used to undertake the ESOR assessment are the HadUK and Environment Agency Daily Rainfall Tool (DRT) catchment rainfall datasets for the two hydrological areas and provided by the Environment Agency to Southern Water under license on a monthly basis. The specific datasets are HadUK_v1_0_2_0 for the period 1871 – 2022, HadUK_v1_3_0_0 for 2023 and the EA DRT for the period 2023 - 2025. The data that Southern Water receives are derived from a collection of gridded rainfall data derived from the network of UK land surface observations. The most recent data, implemented within this report, are now available at a 1km x 1km resolution, thus reducing any related uncertainties regarding gridding methods.

Rainfall has been assessed over the past few years across the River Test and Hampshire Tertiaries hydrological areas, including relative to long-term average (LTA) statistics. Table 1 sets out the key hydrological and rainfall series that have been included for the River Test Drought Order in DP19, including the Hampshire Tertiaries as a supporting dataset. This reflects the point that the water resource zones and the distribution of the supply network do not map evenly onto hydrological catchments.

Table 1: Relationship of the Drought Order and Permit options to EA Hydrological Catchment Rainfall Series and rainfall triggers based on Standard Precipitation Indices (SPI) to support ESOR Assessment for the River Test.

Drought Order or Order	Water Resource Zone	Primary Hydrological Area Rainfall Series	Supporting Hydrological Area Rainfall Series	SPI and Drought Triggers available
River Test	Hampshire Southampton West	River Test	Hampshire Tertiaries (for River Blackwater)	Yes, for River Test, not for Hampshire Tertiaries

Monthly rainfall data will form the basis of the ESOR assessment, and the following analysis will be presented to support the assessment to demonstrate that an ESOR has occurred:

- Ranked cumulative rainfall totals for the duration of the drought period.
- Rainfall probability ranking using the Cunnane plotting position (Cunnane, 1978) using the full HadUK and DRT rainfall data sequence (1871 – 2025) for the River Test and Hampshire Tertiaries areas.
- SPI data for the drought period of interest.
- Assessment of long-term average (LTA) percentage rainfall compared against the 1991-2020 data sequence climate multiple.
- Supporting evidence of a serious deficiency of supplies linked to an ESOR based on river flows and soil moisture deficits.
- Forecasts of rainfall and flow up until 29th July 2025 to support the ESOR case.

Southern Water's drought monitoring strategy has also taken into account additional rainfall metrics, principally the Standard Precipitation Index (SPI). The SPI is a measure of deviation from average values of rainfall at a given site, normalised according to the natural variability (expressed as a standard deviation). It uses cumulative rainfall over a defined preceding period to provide indicators of both drought intensity and drought duration.

3 Technical Analysis Methods

The technical analyses undertaken within this report may be carried out for up to three different sets of data to make the case for an ESOR:

- Actual recent data based on hydrological area-level observational data from EA.
- Average forecast (Table 2) obtained from Hydromaster (Hydromaster, 2025).
- 10th percentile forecast (Table 2) obtained from Hydromaster (Hydromaster 2025).

3.1 Timeseries of rainfall

A timeseries of rainfall data against cumulative deficits for the River Test and Hampshire Tertiaries hydrological areas has been analysed, covering the period of June 2024 to June 2025 (based on the current recent actual data from the EA DRT at the time of application) and compared to the LTA (1991-2020) conditions. This is presented in Figure 2 and Figure 3. The data indicate that:

- Notably higher than average rainfall was received in both hydrological areas in September 2024 and January 2025.
- Both areas have received lower than average rainfall since March 2025.
- A cumulative deficit of 148mm was recorded in the River Test area, and a deficit of 130mm in the Hampshire Tertiaries area by the end of June 2025.
- A minimum of 7.8mm of rainfall was recorded for both the River Test and Hampshire Tertiaries hydrological areas in March 2025. Rainfall within the River Test area in March 2025 is ranked as the 4th lowest rainfall record for March since the start of the dataset in 1871.

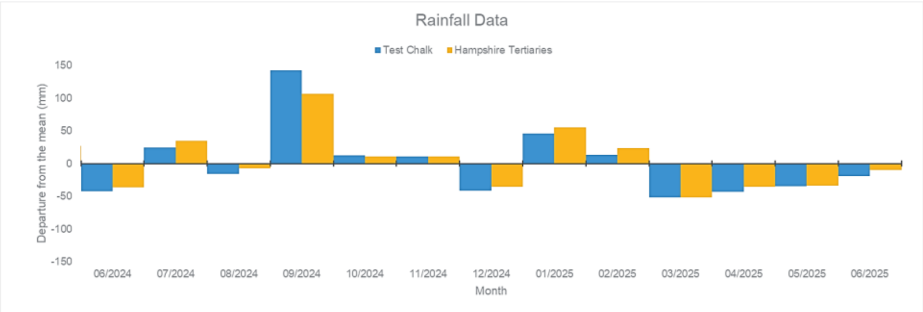

Figure 2: Timeseries of actual rainfall data across the Test and Hampshire tertiaries from June 2024 to June 2025.

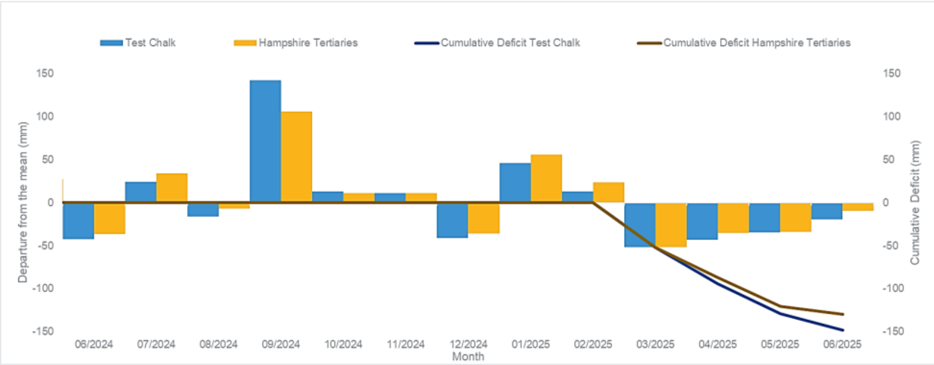

Figure 3: Timeseries of actual rainfall data against cumulative deficit across the Test and Hampshire tertiaries from June 2024 to June 2025.

Data was also retrieved from the UKCEH Water Resources Portal (UKCEH, 2025) for rainfall totals between June 2024 and June 2025 for the Broadlands gauge on the River Test. March 2025 was classed as having Exceptionally Low rainfall, with April and May also classed as having Notably Low rainfall (Figure 4).

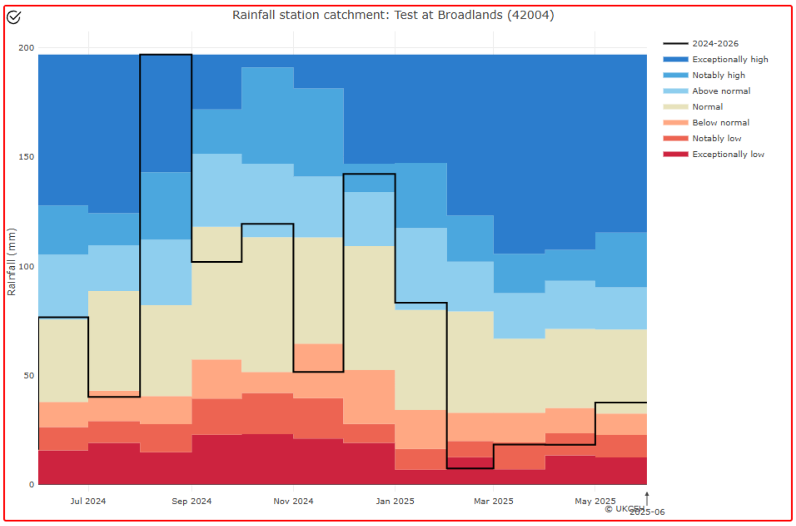

Figure 4: Rainfall data recorded on the River Test at Broadlands gauge between June 2024 - June 2025 (UKCEH, 2025).

Although higher than average rainfall was received in stages over Autumn and Winter 2024/2025, there are currently no means of capturing and storing this rainfall within the catchment due to a lack of surface water storage options. Significantly lower than average rainfall was recorded across both hydrological areas between March and June 2025. This highlights a significant future risk as any continued prolonged period of dry weather into summer and autumn 2025 will further compound the dry spring, with the River Test reliant solely on the groundwater aquifer for baseflow.

3.2 Rainfall forecasts

Rainfall forecasts have been used within this ESOR case to supplement the observational data from the first half of July (up until the date of application) with an additional 15-day forecast to bring the period of analysis until the 29th July 2025.

The Met Office current forecast (Met Office, 2025b) until the end of July for London and the South East suggests that: "*The first couple of days will likely be dominated by low pressure leading to particularly unsettled weather, with heavy rain and/or thunderstorms in some areas. Thereafter, a general westerly regime looks to become established, with occasional weather systems moving in from the Atlantic… some drier, sunnier periods [are expected], temperatures are expected to average out above normal and whilst brief hotter and humid days are possible. This broad pattern is likely to continue through to the end of July*."

Hydromaster currently forecasts 34.6mm of rainfall (50th percentile) for the next 15 days for the Fullerton area, and 29.6mm (50th percentile) for the Millbrook area, totalling just under 50mm expected by the 29th July. The data currently indicate that there is still a 50% chance that rainfall will be below the LTA for July 2025. It is imperative that Southern Water consider the worst-case scenario to ensure that water supplies are safeguarded for their customers, which may result in rainfall 30% below the LTA.

Table 2: Rainfall forecast for the Fullerton and Millbrook areas using Hydromaster data up until 29th July 2025.

	Rainfall Forecast (mm)					
	10th Percentile		50th Percentile		90th Percentile	
Date	**Fullerton**	**Millbrook**	**Fullerton**	**Millbrook**	**Fullerton**	**Millbrook**
1st -14th July (Actual)	15.3	17.0	15.3	17.0	15.3	17.0
15th July	0.2	0.3	0.5	0.9	1.1	1.4
16th July	1	0.9	2.7	2	5	3.4
17th July	0	0	0.5	0.1	0.8	0.2
18th July	0	0	1.2	1.1	3	2.7
19th July	0	0	1.8	1.1	3.5	2.5
20th July	0.6	0.1	5	4.4	11.7	12.2
21st July	0.7	0.8	6.1	5.3	13.1	10.7
22nd July	0.4	0.6	4.7	4	11	9.8
23rd July	0	0	2.6	2.8	6.8	8.7
24th July	0	0	3.1	2.6	7.2	7.8
25th July	0	0	1.6	1.6	5.5	4.3
26th July	0	0	1.3	1	3.2	3
27th July	0	0	1.3	1	3.4	2.7
28th July	0	0	1	0.8	2.6	1.5
29th July	0	0	1.2	0.9	4.2	2.9
July 2025 Total (mm)	18.2	19.7	49.9	46.6	97.4	90.8
% of LTA	32	34	87	81	169	158

Additionally, the forecast from the end of July to mid-August suggests further dry conditions this summer: "*Towards mid-August, there are tentative signs that high pressure may become rather more dominant, which could bring more in the way of dry, settled weather more widely. Temperatures will likely continue to be above average overall, with the possibility of very warm or hot spells developing later in the period, especially further south and east*."

More information on Southern Water's flow forecasting model using outputs of the 15-day forecast can be found in Section 3.6.1.

3.3 Ranked cumulative rainfall totals

A ranking analysis has been undertaken for the River Test and Hampshire Tertiaries areas using recent actual data against the LTA. This analysis has been undertaken for a 3-month cumulative period (Table 3) and ranked by years for cumulative rainfall totals. Extended cumulative periods beyond 3-months include anomalous rainfall events—most notably in September 2024 and January 2025 —during which rainfall was significantly above average. However, due to limited storage capacity within the catchment, much of this excess rainfall could not be retained. Therefore, the cumulative analysis has been limited to 3 months to align with the focus period for this ESOR when rainfall levels declined to below-average values and storage constraints became a defining factor.

The 3-month cumulative rainfall up to the end of June 2025 is ranked 7th out of 155 years of historic records in terms of lowest cumulative rainfall for the River Test hydrological area and 10th lowest for the Hampshire Tertiaries area (Table 3). Total rainfall in the preceding 3 months varied between 75.6mm to 93.7 mm, which represents less than half (44%) of the LTA rainfall in the River Test area to 52% of the LTA rainfall in the Hampshire Tertiaries area (based on an LTA of 1991-2020).

Table 3: Ranked 3-month cumulative rainfall totals up to the end of June 2025.

	Rank	Year	Rainfall (mm)	Deficit (% of LTA)
River Test	1	1893	58.9	34%
	2	1940	63.7	37%
	3	1938	64.0	37%
	4	1976	64.4	37%
	5	1921	70.2	41%
	6	1995	70.4	41%
	7	2025	75.6	44%
	8	1896	75.8	44%
	9	2010	77.4	45%
	10	1957	94.2	55%
	7	2025	75.6	44%
Hampshire Tertiaries	1	1893	56.6	31%
	2	1940	60.9	34%
	3	1976	61.6	34%
	4	1995	69.4	39%
	5	2010	69.7	39%
	6	1938	73.3	41%
	7	1896	78.4	44%
	8	1957	84.7	47%
	9	1921	85.5	48%

	Rank	Year	Rainfall (mm)	Deficit (% of LTA)
	10	2025	93.7	52%
	10	2025	93.7	52%

3.4 Rainfall probability ranking

Rainfall probability ranking was conducted for the River Test hydrological area from 1871 to present using recent actual data (from the EA HADUK and DRT datasets), for durations up to 12 months starting from June in each year. Each cell is shaded to indicate how the rainfall in each year relates to the Cunnane plotting position (Table 4). The ranking of the rainfall totals over each of the 12 month durations and the full rainfall ranking probability tables since 1871 can be found in Appendix A.

Table 4: Ranking categories according to the Cunnane plotting position.

Category	Min	Max	Probability
Exceptionally high	0.95		5.00%
Notably high	0.87	0.95	8.00%
Above normal	0.721	0.869	15.00%
Normal	0.28	0.72	44.00%
Below normal	0.131	0.279	15.00%
Notably low	0.05	0.13	8.00%
Exceptionally low		0.05	5.00%

The results of the probability ranking show that the 3 and 4 months of rainfall up until June 2025 were categorised as Exceptionally Low, ranked 7th and 3rd respectively out of 155 years of data. These figures are in line with previous severe drought events such as in 1921 (ranked 5th and 6th respectively) and 1976 (ranked 4th for both durations) (Table 5). The previous 8-month period before June 2025 is also categorised as Below Normal, showing that the rainfall received in the River Test hydrological area in November and December 2024 was not enough to compensate for the lack of rainfall in spring 2025. The data also shows that over a 2 to 5 month duration, 2025 has been drier than the previous drought recorded in 2022.

Table 5: Rainfall probability ranking using the full data record (155 years) using Cunnane plotting position from 2015 to 2025.

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
2015	0.20	0.40	0.18	0.08	0.10	0.16	0.14	0.27	0.33	0.27	0.35	0.28
2016	0.76	0.88	0.85	0.91	0.92	0.97	0.93	0.87	0.84	0.78	0.88	0.86
2017	0.47	0.52	0.22	0.26	0.29	0.35	0.16	0.18	0.09	0.12	0.07	0.04
2018	0.01	0.05	0.26	0.69	0.56	0.57	0.65	0.58	0.35	0.40	0.42	0.58
2019	0.80	0.51	0.40	0.47	0.52	0.29	0.39	0.44	0.33	0.30	0.30	0.25
2020	0.60	0.14	0.26	0.26	0.79	0.88	0.92	0.91	0.94	0.96	0.96	0.95
2021	0.84	0.96	0.82	0.65	0.64	0.67	0.75	0.69	0.90	0.82	0.90	0.87
2022	0.25	0.29	0.13	0.17	0.29	0.11	0.15	0.08	0.14	0.15	0.10	0.15
2023	0.31	0.37	0.51	0.89	0.69	0.83	0.89	0.94	0.96	0.94	0.93	0.84
2024	0.07	0.38	0.60	0.89	0.99	0.98	0.98	0.98	0.98	0.98	0.99	0.99
2025	0.36	0.10	0.04	0.02	0.06	0.22	0.16	0.22	0.30	0.72	0.69	0.73

3.5 Standard Precipitation Indices

SPI data was calculated for the River Test and Hampshire Tertiaries hydrological areas from the Environment Agency's daily rainfall tool (DRT) and HADUK datasets (recent actual data). An SPI of <-1 was considered by McKee (1993) to be indicative of drought onset and numbers consistently below 0 with an increasingly negative trend are indicative of prolonged dry weather. Only a 3-month accumulation period has been shown to align with the focus period for this ESOR when rainfall levels declined to below-average values and storage constraints became a defining factor.

June 2025 had a lower SPI value over a 3-month accumulation period than both 2019 and 2022 for the River Test and Hampshire Tertiaries areas, indicative of extreme drought conditions and significantly low rainfall through spring 2025 (Figure 5).

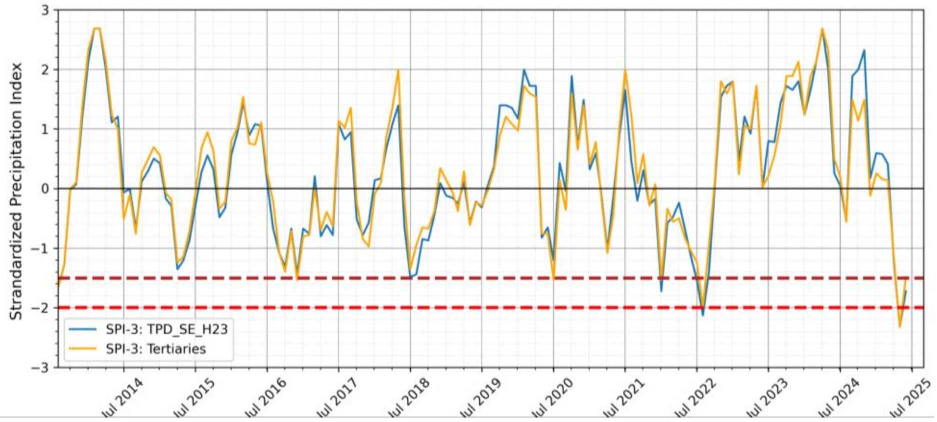

Figure 5: SPI trends from 2015 to 2025 for the River Test hydrological tertiary.

SPI data was also retrieved from the UK Water Resources Portal for the Broadlands gauge on the River Test. Over a 1-month accumulation period, rainfall in the catchment was classed to be between Mildly and Extremely Dry from March 2025 until present, with a minimum SPI of -2.833 in March 2025 (Figure 6). For an accumulation period of 3 months, the SPI decreases further to a minimum of -3.414 in May 2025 (Extremely Dry), with June 2025 also classed as Severely Dry (-2.123) (Figure 7).

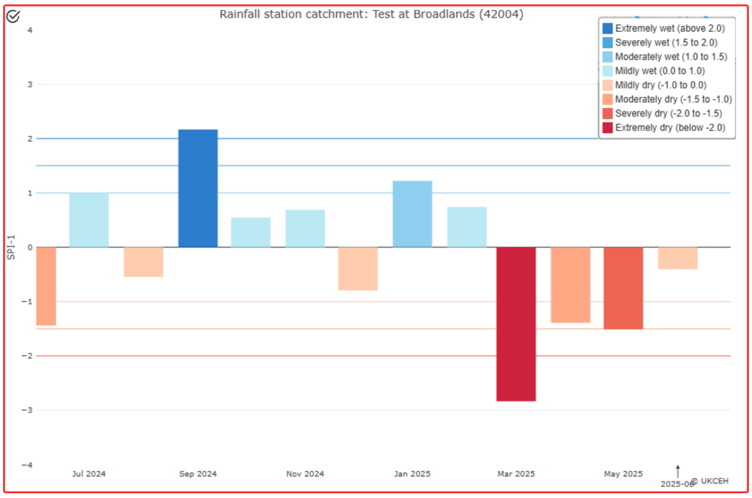

Figure 6: SPI data for the River Test (Broadlands gauge) for a 1-month accumulation period between June 2024 - June 2025 (UKCEH, 2025).

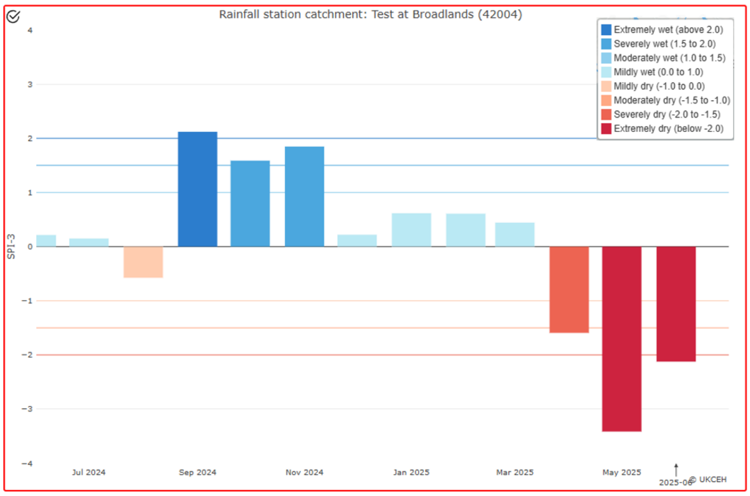

Figure 7: SPI data for the River Test (Broadlands gauge) for a 3-month accumulation period between June 2024 - June 2025 (UKCEH, 2025).

3.6 Other Meteorological and Hydrometric Measures

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3.6.1 River flow – actual and forecasted

Monthly recent actual flow data for the River Test (TTF) for June 2025 is ranked 14th lowest out of the 49-year record (between 1977 and 2025), and for the three months between April and June 2025 data is ranked 18th lowest out of 49 years. The data shows that TTF has reduced by 1,777 Ml/d between January 2025 and June 2025. This decrease is ranked 3rd largest out of the 49-year record, indicating that flow within the River Test has decreased at a significantly quicker rate than in previous historical years.

Southern Water has developed a set of tools for forecasting flows in the River Test to help understand the risks of the drought progressing. The forecasts use a combination of actual weather forecasts of potential rainfall for the next 15 days, together with climatic ensemble data to understand the longer-term risks. The combined rainfall datasets are run through a *Catchmod* rainfall-runoff model of the River Test to generate prospective river flows (the TTF sequence) for a range of rainfall scenarios.

The short-term 15-day forecast is derived from outputs from KISTERS *HydroMaster tool* (2025). This provides summary data of the average 10th percentile and 90th percentile outcomes from weather forecast ensembles. These weather forecasts are combined with the 18,400-year dataset of climatic ensembles, which have been developed for Water Resources in the South East and used for the development of the Water Resources South East (WRSE) Regional Resilience Plan.

The *Catchmod* rainfall-runoff model is initiated for the last day when there is observed flow data available, and the model is set up so that initial flows match observed flows. The model runs through multiple iterations of potential rainfall to generate outputs as shown in Figure 8.

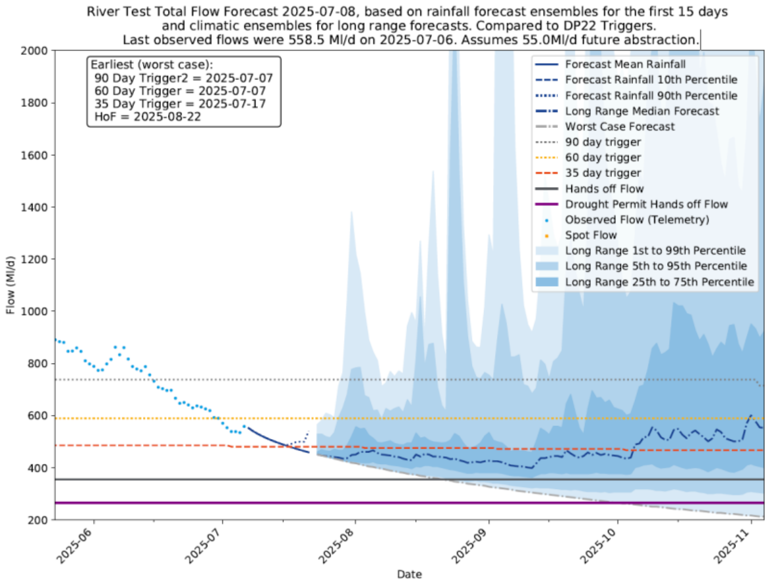

Figure 8: Forecast flows on the River Test based on an ensemble of 18,400 years of synthetic data.

Under both an average and dry scenario, flows will fall below the 35-day trigger but not below the HOF condition, meaning a Drought Order application would be made, but the Order would not be needed. However, under the very dry scenario, flows would drop below the HOF within August 2025, and the Drought Order would be required for several months. It is imperative that Southern Water consider the worst-case scenario to ensure that water supplies are safeguarded for their customers.

Standardised Streamflow Index (SSI) recent actual data for the River Test (Broadlands gauge) categorises flows as Mildly to Moderately Wet between March to June 2025 (Figure 9). This indicates that the underlying chalk aquifer supplying the River Test compensated for the significant reduction in rainfall in spring 2025 up until this point. However, there is a noticeable downwards trend in SSI since November 2024, with flow likely to be categorised as mildly dry without rainfall to support the groundwater input into the River Test.

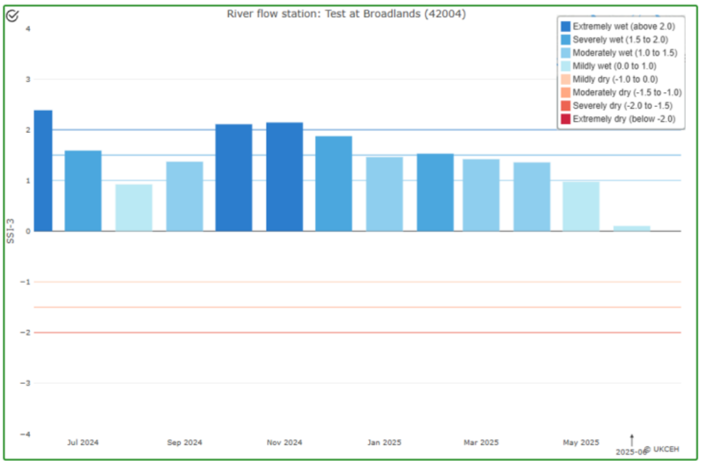

Figure 9: SSI data for the River Test (Broadlands gauge) for a 3-month accumulation period between June 2024 - June 2025 (UKCEH, 2025).

This is reflected in the SSI data for the River Test (Broadlands gauge) over a 1-month accumulation period, which steadily decreases to Mildly Dry flow category in May and June 2025 (Figure 10). Therefore, without further rainfall in summer 2025 to compliment the groundwater supply from the underlying chalk aquifer, flow in the River Test is predicted to fall below the Hands Off Flow (HOF) limit of 355Ml/d.

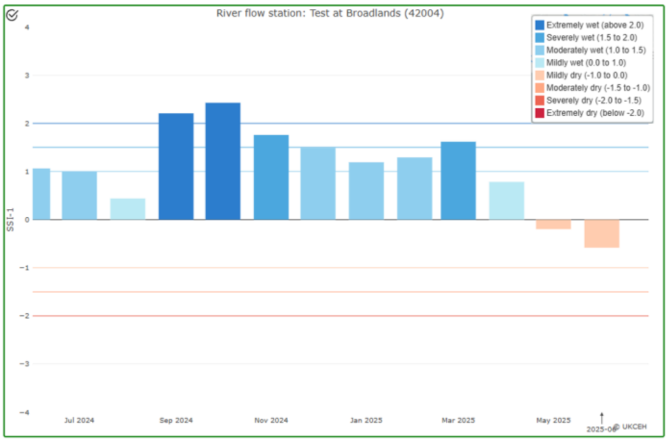

Figure 10: SSI data for the River Test (Broadlands gauge) for a 1-month accumulation period between June 2024 - June 2025 (UKCEH, 2025).

3.6.2 Soil moisture deficit

Soil moisture deficit (SMD) data was obtained from the Environment Agency's South East Soil Moisture Model (SESMM). There has been a significant increase in SMD within both the Test Chalk and East Hampshire Chalk tertiaries between March and July 2025 compared to the same period in 2024, with a maximum difference of 83mm recorded between May 2024 and May 2025 for the Test Chalk catchment (Figure 11; Figure 12). It should be noted that July 2025 has been calculated as a 14-day average due to the availability of data at the time of writing.

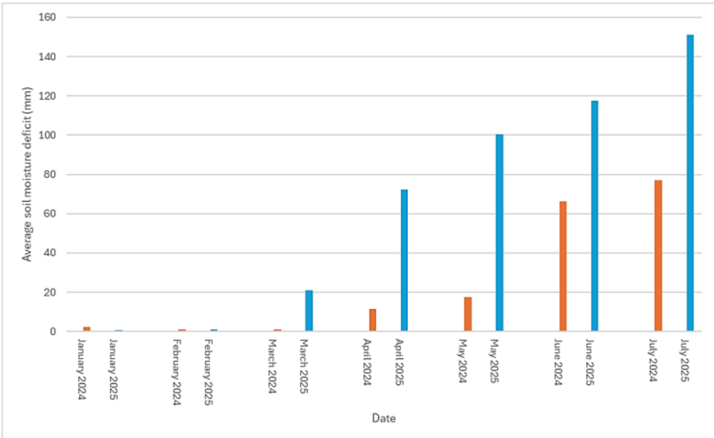

Figure 11: Average soil moisture deficit for the Test Chalk catchment between January 2024 and July 2025. Contains Environment Agency information © Environment Agency and/or database rights.

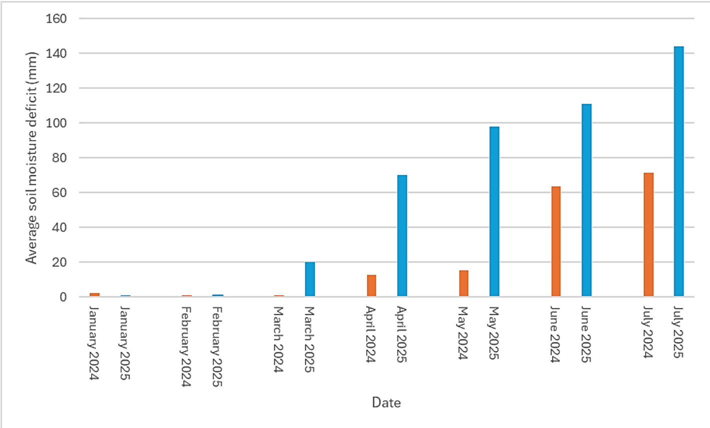

Figure 12: Average soil moisture deficit for the East Hampshire Chalk catchment between January 2024 and June 2025. Contains Environment Agency information © Environment Agency and/or database rights.

Volumetric water content (VWC) data for soils within the Test catchment (Porton Down site) indicate that between June 2024 to February 2025, the soils ranged from a normal VWC (27.2% in August 2024) to having a Notably High VWC (50.9% in January 2025) in line with the Notably High rainfall received within the Test Chalk tertiary in January 2025 (Figure 13). In spring 2025, VWC dropped from 44.9% in March to 23.1% in May, indicating a significant soil moisture deficit within the catchment. Therefore, it is highly likely that any additional rainfall received in Summer 2025 will be absorbed by soils within the catchment rather than entering the River Test as streamflow.

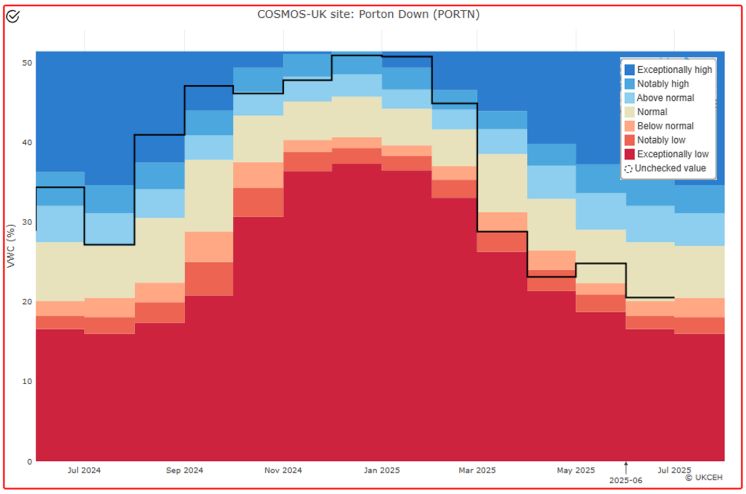

Figure 13: Volumetric water content of soils within the Test catchment (UKCEH, 2025).

4 Summary and Conclusions

Drawing upon the analyses within this report, Southern Water believe there has been an ESOR between March and June 2025 from a water resource perspective. Despite adequate rainfall during autumn and winter 2024, the prolonged dry period beginning in March 2025 has placed considerable pressure on water resources. This has resulted in significantly drier than average conditions.

March 2025 recorded exceptionally low rainfall, totalling just 7.8 mm for both the River Test and Hampshire Tertiaries hydrological areas. This is the 4th-lowest rainfall record for March since the start of the River Test area dataset in 1871. April and May were also categorised as having Notably Low rainfall. Based on historical rankings, the 3-month cumulative rainfall for 2025 ranks as the seventh driest in a 155-year record for the River Test area and has a low SPI on a 3-month accumulation period; indicative of extreme drought conditions.

Whilst flow in the River Test was classed as Mildly to Moderately Wet between March and May on a 3-month accumulation period, the TTF decreased by 1,777 Ml/d between January 2025 and June 2025, ranked as the 3rd largest decrease over a 49-year record. This is reflected in the latest SSI for the River Test, which is categorised as Mildly Dry in May 2025 on a 1-month accumulation period. Additionally, average SMD within the catchment a maximum of 83mm higher in May 2025 than May 2024, with an outstanding SMD of 144mm in July 2025. This indicates that any additional rainfall in July and into summer 2025 is likely to be absorbed by the ground rather than contributing to the TTF.

In the present case, the river flow is forecast to fall below the licence condition flow (355 Ml/d) in mid August 2025 under a 'very dry' worst-case scenario. As groundwater level within the aquifer is currently classed as Normal (as of July 2025) and the Testwood abstraction is within the usual licence conditions, the significant drop in TTF flows can be attributed to the antecedent rainfall conditions since March 2025. Without sufficient rainfall to complement the groundwater baseflow supply from the underlying chalk aquifer. The lack of sufficient surface water storage capacity within the catchment has exacerbated the situation, as the Testwood abstraction is solely reliant on water from the River Test. From undertaking these analyses, Southern Water believe there is sufficient evidence to support the belief that customers within the Hampshire Southampton West Zone are in danger of a threatened water supply.

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Appendix A

Table 6: Rainfall probability ranking for full data record (155 years).

	Duration (months starting from June that year)											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1871	120	66	122	98	72	60						
1872	123	135	130	124	126	150	137	104	80	109	95	118
1873	71	48	21	38	28	65	99	115	127	113	111	121
1874	52	27	32	11	19	16	7	11	8	8	9	10
1875	132	122	109	71	77	103	85	74	99	108	103	86
1876	88	28	45	82	98	59	33	46	85	77	69	103
1877	28	69	108	100	75	130	146	143	139	145	146	140
1878	105	144	142	119	117	79	56	109	90	75	87	107
1879	153	154	153	142	149	147	130	125	119	104	125	120
1880	108	41	38	25	59	22	13	7	2	3	13	26
1881	86	47	16	26	49	29	41	34	58	81	67	95
1882	138	126	145	126	116	81	80	92	61	55	102	96
1883	96	84	52	29	95	92	82	89	128	126	116	122
1884	109	65	53	63	54	64	32	36	33	49	38	49
1885	70	105	103	83	115	115	103	73	43	41	31	35
1886	32	112	114	103	60	77	47	52	64	91	73	51
1887	46	34	23	20	13	17	49	53	73	70	59	61
1888	129	116	115	134	110	58	48	49	34	37	30	18
1889	34	73	92	90	84	42	37	64	42	40	36	64
1890	110	97	107	73	40	52	39	20	26	23	24	30
1891	44	85	56	60	20	15	10	10	4	2	4	9
1892	64	35	11	8	7	3	12	16	78	68	108	110
1893	42	15	1	2	11	8	4	8	11	15	27	31
1894	101	83	91	69	63	68	75	55	57	46	39	54
1895	28	3	18	19	8	9	14	39	49	50	50	72
1896	82	19	8	33	14	7	9	24	24	21	19	38
1897	91	61	49	113	130	117	120	84	77	123	122	108
1898	62	107	101	58	43	12	36	17	9	12	15	14
1899	64	53	88	42	62	84	78	97	105	90	70	53
1900	117	95	80	54	113	122	84	100	91	83	68	55
1901	64	33	46	46	36	21	42	37	35	26	29	19
1902	139	142	128	115	91	47	83	40	32	34	32	37
1903	147	152	152	155	151	146	129	126	104	86	97	81
1904	30	87	68	50	85	113	96	70	137	133	139	143
1905	146	106	105	145	119	71	70	41	31	32	37	36
1906	114	98	67	48	55	118	67	72	50	48	62	42
1907	84	76	120	80	61	28	24	33	74	54	42	28
1908	15	37	80	109	79	50	74	63	113	89	84	77
1909	143	124	113	137	103	51	52	25	14	16	22	21
1910	141	125	131	99	129	125	124	80	118	120	120	125
1911	75	74	62	61	50	23	58	66	82	53	52	49
1912	148	130	70	121	127	134	150	149	149	143	132	114

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
1913	10	42	83	102	68	101	115	98	95	88	127	123
1914	27	30	14	79	125	74	51	48	68	76	63	57
1915	41	114	82	52	118	135	149	151	148	140	138	142
1916	79	59	25	59	121	83	133	121	121	115	114	133
1917	133	128	119	118	90	49	64	95	111	106	119	112
1918	25	32	61	32	25	37	19	12	17	18	40	59
1919	22	2	12	94	97	120	95	90	66	103	94	128
1920	92	64	118	110	70	78	118	99	59	61	65	58
1921	3	6	5	6	2	5	6	6	5	4	3	13
1922	40	10	63	65	83	106	71	51	30	25	17	11
1923	7	13	51	55	114	85	90	65	40	36	48	71
1924	103	145	148	136	93	96	92	67	103	98	101	82
1925	1	75	97	43	106	94	119	114	123	138	135	146
1926	99	90	125	76	67	107	106	94	97	102	104	115
1927	112	67	66	104	136	128	73	130	115	97	80	76
1928	102	77	71	84	76	124	122	124	108	139	141	147
1929	53	44	19	5	4	2	2	5	12	11	10	8
1930	13	20	35	21	12	25	94	142	142	127	112	104
1931	98	115	135	92	78	56	59	85	63	74	82	80
1932	72	147	150	144	110	100	53	57	28	30	43	62
1933	114	92	77	105	134	127	81	58	79	93	78	83
1934	47	18	26	55	18	19	8	3	3	5	2	2
1935	151	131	147	122	140	98	145	135	120	111	113	105
1936	104	48	48	62	71	116	116	139	144	146	148	145
1937	53	89	104	130	152	154	151	148	143	144	134	144
1938	18	24	3	1	1	4	5	4	7	7	6	3
1939	84	51	65	37	27	72	91	111	109	92	91	89
1940	11	1	2	14	26	24	16	47	70	52	49	88
1941	61	56	50	91	101	93	62	129	130	118	93	98
1942	4	78	76	67	32	43	28	29	19	9	20	23
1943	48	82	47	22	15	61	89	61	75	69	81	70
1944	100	38	31	9	6	6	3	2	6	6	5	4
1945	127	118	90	53	51	30	29	60	86	80	76	87
1946	131	148	144	122	124	119	126	71	88	82	74	65
1947	68	40	55	140	122	109	93	132	107	137	143	138
1948	95	140	124	87	56	126	113	82	46	39	21	16
1949	8	46	43	28	21	10	30	18	16	22	35	22
1950	43	43	73	51	112	55	35	38	100	99	86	75
1951	16	68	106	135	155	152	141	147	136	141	147	150
1952	60	103	100	111	66	53	50	122	93	101	120	117
1953	73	71	99	47	37	13	17	21	38	45	58	40
1954	136	123	72	86	104	70	34	22	29	35	33	45
1955	114	149	117	88	64	66	60	110	98	95	106	111
1956	79	23	17	12	5	13	27	23	25	27	11	6
1957	67	57	10	16	48	38	69	32	23	42	64	73
1958	135	129	95	68	82	91	88	69	62	72	77	99

	Duration (months starting from June that year)											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1959	26	4	42	81	33	57	63	54	56	85	98	94
1960	119	85	59	49	57	86	136	133	125	94	90	84
1961	35	14	85	30	47	69	87	105	146	149	151	151
1962	6	29	27	18	9	27	40	26	44	57	51	47
1963	126	99	132	152	138	97	77	78	53	73	85	74
1964	122	139	136	147	131	82	45	83	65	71	79	67
1965	90	70	60	78	31	41	43	30	21	14	8	5
1966	113	127	149	126	146	139	142	140	122	129	128	139
1967	58	143	126	120	132	136	127	107	129	116	130	131
1968	127	133	134	108	91	76	68	44	96	105	105	92
1969	51	117	84	95	74	99	102	81	84	121	117	116
1970	50	17	36	36	42	63	66	77	41	33	34	32
1971	154	151	151	151	139	148	128	145	134	131	126	127
1972	87	101	112	125	142	142	108	103	87	59	57	43
1973	107	121	116	66	34	20	46	50	36	29	18	15
1974	140	104	57	35	105	138	123	96	60	56	55	52
1975	5	9	15	45	24	66	54	106	81	124	129	124
1976	14	12	4	4	3	1	1	1	1	1	1	1
1977	111	94	74	96	134	133	134	134	145	148	145	141
1978	59	52	54	72	80	102	110	101	89	64	92	66
1979	77	146	139	153	150	145	153	144	126	107	96	102
1980	142	113	75	106	109	80	114	93	72	51	53	48
1981	63	108	94	148	137	114	79	59	69	67	72	69
1982	144	132	102	131	120	95	107	79	76	119	99	97
1983	76	118	140	132	108	108	111	119	138	134	130	119
1984	37	88	33	57	38	88	86	56	48	64	45	33
1985	137	136	123	117	96	90	98	116	110	114	109	91
1986	23	79	96	89	44	73	112	86	55	44	61	56
1987	125	93	110	114	102	45	65	88	83	63	83	78
1988	56	39	22	39	41	87	55	45	94	78	60	60
1989	45	7	29	64	85	48	21	14	13	13	14	27
1990	78	25	13	7	65	111	139	122	117	100	88	68
1991	149	96	111	116	94	121	109	76	67	58	46	34
1992	97	50	89	97	73	36	15	15	10	10	7	12
1993	89	111	141	133	89	110	105	131	114	117	136	136
1994	20	72	87	85	100	123	135	117	135	142	133	129
1995	9	5	6	10	35	112	121	113	124	132	124	109
1996	17	31	23	23	39	32	44	62	45	79	56	46
1997	145	134	86	44	87	39	18	42	39	28	25	17
1998	150	120	146	150	128	140	132	138	133	110	115	100
1999	134	110	121	93	58	104	96	87	112	130	110	101
2000	19	91	154	146	147	132	140	128	116	136	142	132
2001	33	21	69	129	144	143	147	152	152	152	152	153
2002	94	138	129	112	141	141	104	75	102	96	100	93
2003	81	63	58	31	22	33	76	137	141	135	123	126
2004	55	54	98	75	52	75	72	112	92	60	41	41

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
2005	69	35	37	34	17	11	11	9	20	17	26	29
2006	21	102	78	77	69	35	38	27	37	31	23	25
2007	152	155	143	143	148	149	148	150	151	151	149	149
2008	105	141	136	149	133	144	131	127	101	84	75	105
2009	37	26	28	24	29	44	31	31	27	38	44	63
2010	23	10	9	15	30	31	57	120	106	87	71	85
2011	121	100	39	17	23	40	20	19	18	20	28	20
2012	155	153	155	154	145	131	124	102	71	66	89	79
2013	35	55	44	70	53	62	100	118	132	125	118	137
2014	83	109	138	128	153	155	154	154	154	154	153	152
2015	31	62	29	13	16	26	22	43	52	43	54	44
2016	118	137	133	141	143	151	144	136	131	122	137	134
2017	74	81	34	40	46	54	25	28	15	19	12	7
2018	2	8	41	107	88	89	101	91	54	62	66	90
2019	124	80	63	74	81	46	61	68	51	47	47	39
2020	93	22	40	41	123	137	143	141	147	150	150	148
2021	130	150	127	101	99	105	117	108	140	128	140	135
2022	39	45	20	27	45	18	23	13	22	24	16	24
2023	49	58	79	139	107	129	138	146	150	147	144	130
2024	12	60	93	138	154	153	152	153	153	153	154	154
2025	56	16	7	3	10	34	26	35	47	112	107	113

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
1871	0.77	0.42	0.78	0.63	0.46	0.38						
1872	0.79	0.87	0.84	0.80	0.81	0.96	0.88	0.67	0.51	0.70	0.61	0.76
1873	0.45	0.31	0.13	0.24	0.18	0.42	0.64	0.74	0.82	0.73	0.71	0.78
1874	0.33	0.17	0.20	0.07	0.12	0.10	0.04	0.07	0.05	0.05	0.06	0.06
1875	0.85	0.78	0.70	0.45	0.49	0.66	0.55	0.47	0.64	0.69	0.66	0.55
1876	0.56	0.18	0.29	0.53	0.63	0.38	0.21	0.29	0.55	0.49	0.44	0.66
1877	0.18	0.44	0.69	0.64	0.48	0.84	0.94	0.92	0.89	0.93	0.94	0.90
1878	0.67	0.93	0.91	0.76	0.75	0.51	0.36	0.70	0.58	0.48	0.56	0.69
1879	0.98	0.99	0.98	0.91	0.96	0.94	0.84	0.80	0.76	0.67	0.80	0.77
1880	0.69	0.26	0.24	0.16	0.38	0.14	0.08	0.04	0.01	0.02	0.08	0.16
1881	0.55	0.30	0.10	0.16	0.31	0.18	0.26	0.22	0.37	0.52	0.43	0.61
1882	0.89	0.81	0.93	0.81	0.74	0.52	0.51	0.59	0.39	0.35	0.65	0.62
1883	0.62	0.54	0.33	0.18	0.61	0.59	0.53	0.57	0.82	0.81	0.74	0.78
1884	0.70	0.42	0.34	0.40	0.35	0.41	0.20	0.23	0.21	0.31	0.24	0.31
1885	0.45	0.67	0.66	0.53	0.74	0.74	0.66	0.47	0.27	0.26	0.20	0.22
1886	0.20	0.72	0.73	0.66	0.38	0.49	0.30	0.33	0.41	0.58	0.47	0.33
1887	0.29	0.22	0.15	0.13	0.08	0.11	0.31	0.34	0.47	0.45	0.38	0.39
1888	0.83	0.74	0.74	0.86	0.71	0.37	0.31	0.31	0.22	0.24	0.19	0.11
1889	0.22	0.47	0.59	0.58	0.54	0.27	0.24	0.41	0.27	0.26	0.23	0.41
1890	0.71	0.62	0.69	0.47	0.26	0.33	0.25	0.13	0.16	0.15	0.15	0.19
1891	0.28	0.55	0.36	0.38	0.13	0.09	0.06	0.06	0.02	0.01	0.02	0.06

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
1892	0.41	0.22	0.07	0.05	0.04	0.02	0.07	0.10	0.50	0.44	0.69	0.71
1893	0.27	0.09	0.00	0.01	0.07	0.05	0.02	0.05	0.07	0.09	0.17	0.20
1894	0.65	0.53	0.58	0.44	0.40	0.44	0.48	0.35	0.36	0.29	0.25	0.35
1895	0.18	0.02	0.11	0.12	0.05	0.06	0.09	0.25	0.31	0.32	0.32	0.46
1896	0.53	0.12	0.05	0.21	0.09	0.04	0.06	0.15	0.15	0.13	0.12	0.24
1897	0.58	0.39	0.31	0.73	0.84	0.75	0.77	0.54	0.49	0.79	0.78	0.69
1898	0.40	0.69	0.65	0.37	0.27	0.07	0.23	0.11	0.06	0.07	0.09	0.09
1899	0.41	0.34	0.56	0.27	0.40	0.54	0.50	0.62	0.67	0.58	0.45	0.34
1900	0.75	0.61	0.51	0.35	0.73	0.78	0.54	0.64	0.58	0.53	0.44	0.35
1901	0.41	0.21	0.29	0.29	0.23	0.13	0.27	0.24	0.22	0.16	0.18	0.12
1902	0.89	0.91	0.82	0.74	0.58	0.30	0.53	0.26	0.20	0.22	0.20	0.24
1903	0.94	0.98	0.98	1.00	0.97	0.94	0.83	0.81	0.67	0.55	0.62	0.52
1904	0.19	0.56	0.44	0.32	0.55	0.73	0.62	0.45	0.88	0.85	0.89	0.92
1905	0.94	0.68	0.67	0.93	0.76	0.45	0.45	0.26	0.20	0.20	0.24	0.23
1906	0.73	0.63	0.43	0.31	0.35	0.76	0.43	0.46	0.32	0.31	0.40	0.27
1907	0.54	0.49	0.77	0.51	0.39	0.18	0.15	0.21	0.47	0.35	0.27	0.18
1908	0.09	0.24	0.51	0.70	0.51	0.32	0.47	0.40	0.73	0.57	0.54	0.49
1909	0.92	0.80	0.73	0.88	0.66	0.33	0.33	0.16	0.09	0.10	0.14	0.13
1910	0.91	0.80	0.84	0.64	0.83	0.80	0.80	0.51	0.76	0.77	0.77	0.80
1911	0.48	0.47	0.40	0.39	0.32	0.15	0.37	0.42	0.53	0.34	0.33	0.31
1912	0.95	0.84	0.45	0.78	0.82	0.86	0.96	0.96	0.96	0.92	0.85	0.73
1913	0.06	0.27	0.53	0.65	0.44	0.65	0.74	0.63	0.61	0.56	0.82	0.79
1914	0.17	0.19	0.09	0.51	0.80	0.47	0.33	0.31	0.44	0.49	0.40	0.36
1915	0.26	0.73	0.53	0.33	0.76	0.87	0.96	0.97	0.95	0.90	0.89	0.91
1916	0.51	0.38	0.16	0.38	0.78	0.53	0.85	0.78	0.78	0.74	0.73	0.85
1917	0.85	0.82	0.76	0.76	0.58	0.31	0.41	0.61	0.71	0.68	0.76	0.72
1918	0.16	0.20	0.39	0.20	0.16	0.24	0.12	0.07	0.11	0.11	0.26	0.38
1919	0.14	0.01	0.07	0.60	0.62	0.77	0.61	0.58	0.42	0.66	0.60	0.82
1920	0.59	0.41	0.76	0.71	0.45	0.50	0.76	0.64	0.38	0.39	0.42	0.37
1921	0.02	0.04	0.03	0.04	0.01	0.03	0.04	0.04	0.03	0.02	0.02	0.08
1922	0.26	0.06	0.40	0.42	0.53	0.68	0.45	0.33	0.19	0.16	0.11	0.07
1923	0.04	0.08	0.33	0.35	0.73	0.55	0.58	0.42	0.26	0.23	0.31	0.45
1924	0.66	0.93	0.95	0.87	0.60	0.62	0.59	0.43	0.66	0.63	0.65	0.53
1925	0.00	0.48	0.62	0.27	0.68	0.60	0.76	0.73	0.79	0.89	0.87	0.94
1926	0.64	0.58	0.80	0.49	0.43	0.69	0.68	0.60	0.62	0.65	0.67	0.74
1927	0.72	0.43	0.42	0.67	0.87	0.82	0.47	0.84	0.74	0.62	0.51	0.49
1928	0.65	0.49	0.45	0.54	0.49	0.80	0.78	0.80	0.69	0.89	0.91	0.94
1929	0.34	0.28	0.12	0.03	0.02	0.01	0.01	0.03	0.07	0.07	0.06	0.05
1930	0.08	0.13	0.22	0.13	0.07	0.16	0.60	0.91	0.91	0.82	0.72	0.67
1931	0.63	0.74	0.87	0.59	0.50	0.36	0.38	0.55	0.40	0.47	0.53	0.51
1932	0.46	0.94	0.96	0.93	0.71	0.64	0.34	0.36	0.18	0.19	0.27	0.40
1933	0.73	0.59	0.49	0.67	0.86	0.82	0.52	0.37	0.51	0.60	0.50	0.53
1934	0.30	0.11	0.16	0.35	0.11	0.12	0.05	0.02	0.02	0.03	0.01	0.01
1935	0.97	0.84	0.94	0.78	0.90	0.63	0.93	0.87	0.77	0.71	0.73	0.67
1936	0.67	0.31	0.31	0.40	0.45	0.74	0.74	0.89	0.93	0.94	0.95	0.93
1937	0.34	0.57	0.67	0.84	0.98	0.99	0.97	0.95	0.92	0.93	0.86	0.93

	Duration (months starting from June that year)											
Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1938	0.11	0.15	0.02	0.00	0.00	0.02	0.03	0.02	0.04	0.04	0.04	0.02
1939	0.54	0.33	0.42	0.24	0.17	0.46	0.58	0.71	0.70	0.59	0.58	0.57
1940	0.07	0.00	0.01	0.09	0.16	0.15	0.10	0.30	0.45	0.33	0.31	0.56
1941	0.39	0.36	0.32	0.58	0.65	0.60	0.40	0.83	0.84	0.76	0.60	0.63
1942	0.02	0.50	0.49	0.43	0.20	0.27	0.18	0.18	0.12	0.06	0.13	0.15
1943	0.31	0.53	0.30	0.14	0.09	0.39	0.57	0.39	0.48	0.44	0.52	0.45
1944	0.64	0.24	0.20	0.06	0.04	0.04	0.02	0.01	0.04	0.04	0.03	0.02
1945	0.82	0.76	0.58	0.34	0.33	0.19	0.18	0.38	0.55	0.51	0.49	0.56
1946	0.84	0.95	0.93	0.78	0.80	0.76	0.81	0.45	0.56	0.53	0.47	0.42
1947	0.44	0.26	0.35	0.90	0.78	0.70	0.60	0.85	0.69	0.88	0.92	0.89
1948	0.61	0.90	0.80	0.56	0.36	0.81	0.73	0.53	0.29	0.25	0.13	0.10
1949	0.05	0.29	0.27	0.18	0.13	0.06	0.19	0.11	0.10	0.14	0.22	0.14
1950	0.27	0.27	0.47	0.33	0.72	0.35	0.22	0.24	0.64	0.64	0.55	0.48
1951	0.10	0.44	0.68	0.87	1.00	0.98	0.91	0.94	0.87	0.91	0.94	0.96
1952	0.38	0.66	0.64	0.71	0.42	0.34	0.32	0.78	0.60	0.65	0.77	0.75
1953	0.47	0.45	0.64	0.30	0.24	0.08	0.11	0.13	0.24	0.29	0.37	0.26
1954	0.87	0.79	0.46	0.55	0.67	0.45	0.22	0.14	0.18	0.22	0.21	0.29
1955	0.73	0.96	0.75	0.56	0.41	0.42	0.38	0.71	0.63	0.61	0.68	0.71
1956	0.51	0.15	0.11	0.07	0.03	0.08	0.17	0.15	0.16	0.17	0.07	0.04
1957	0.43	0.36	0.06	0.10	0.31	0.24	0.44	0.20	0.15	0.27	0.41	0.47
1958	0.87	0.83	0.61	0.44	0.53	0.58	0.56	0.44	0.40	0.46	0.49	0.64
1959	0.16	0.02	0.27	0.52	0.21	0.36	0.40	0.35	0.36	0.55	0.63	0.60
1960	0.76	0.55	0.38	0.31	0.36	0.55	0.87	0.85	0.80	0.60	0.58	0.54
1961	0.22	0.09	0.55	0.19	0.30	0.44	0.56	0.67	0.94	0.96	0.97	0.97
1962	0.04	0.18	0.17	0.11	0.06	0.17	0.26	0.16	0.28	0.36	0.33	0.30
1963	0.81	0.64	0.85	0.98	0.89	0.62	0.49	0.50	0.34	0.47	0.55	0.47
1964	0.78	0.89	0.87	0.94	0.84	0.53	0.29	0.53	0.42	0.45	0.51	0.43
1965	0.58	0.45	0.38	0.50	0.20	0.26	0.27	0.19	0.13	0.09	0.05	0.03
1966	0.73	0.82	0.96	0.81	0.94	0.89	0.91	0.90	0.78	0.83	0.82	0.89
1967	0.37	0.92	0.81	0.77	0.85	0.87	0.82	0.69	0.83	0.74	0.84	0.84
1968	0.82	0.85	0.86	0.69	0.58	0.49	0.44	0.28	0.62	0.67	0.67	0.59
1969	0.33	0.75	0.54	0.61	0.47	0.64	0.65	0.52	0.54	0.78	0.75	0.74
1970	0.32	0.11	0.23	0.23	0.27	0.40	0.42	0.49	0.26	0.21	0.22	0.20
1971	0.99	0.97	0.97	0.97	0.89	0.95	0.82	0.93	0.86	0.84	0.81	0.82
1972	0.56	0.65	0.72	0.80	0.91	0.91	0.69	0.66	0.56	0.38	0.36	0.27
1973	0.69	0.78	0.74	0.42	0.22	0.13	0.29	0.32	0.23	0.18	0.11	0.09
1974	0.90	0.67	0.36	0.22	0.67	0.89	0.79	0.62	0.38	0.36	0.35	0.33
1975	0.03	0.06	0.09	0.29	0.15	0.42	0.35	0.68	0.52	0.80	0.83	0.80
1976	0.09	0.07	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1977	0.71	0.60	0.47	0.62	0.86	0.85	0.86	0.86	0.93	0.95	0.93	0.91
1978	0.38	0.33	0.35	0.46	0.51	0.65	0.71	0.65	0.57	0.41	0.59	0.42
1979	0.49	0.94	0.89	0.98	0.96	0.93	0.98	0.93	0.81	0.69	0.62	0.65
1980	0.91	0.73	0.48	0.68	0.70	0.51	0.73	0.60	0.46	0.33	0.34	0.31
1981	0.40	0.69	0.60	0.95	0.88	0.73	0.51	0.38	0.44	0.43	0.46	0.44
1982	0.93	0.85	0.65	0.84	0.77	0.61	0.69	0.51	0.49	0.76	0.64	0.62
1983	0.49	0.76	0.90	0.85	0.69	0.69	0.71	0.76	0.89	0.86	0.84	0.76

	Duration (months starting from June that year)											
Year	1	2	3	4	5	6	7	8	9	10	11	12
1984	0.24	0.56	0.21	0.36	0.24	0.56	0.55	0.36	0.31	0.41	0.29	0.21
1985	0.88	0.87	0.79	0.75	0.62	0.58	0.63	0.74	0.71	0.73	0.70	0.58
1986	0.15	0.51	0.62	0.57	0.28	0.47	0.72	0.55	0.35	0.28	0.39	0.36
1987	0.80	0.60	0.71	0.73	0.65	0.29	0.42	0.56	0.53	0.40	0.53	0.50
1988	0.36	0.25	0.14	0.25	0.26	0.56	0.35	0.29	0.60	0.50	0.38	0.38
1989	0.29	0.04	0.18	0.41	0.55	0.31	0.13	0.09	0.08	0.08	0.09	0.17
1990	0.50	0.16	0.08	0.04	0.42	0.71	0.89	0.78	0.75	0.64	0.56	0.44
1991	0.96	0.62	0.71	0.74	0.60	0.78	0.70	0.49	0.43	0.37	0.29	0.22
1992	0.62	0.32	0.57	0.62	0.47	0.23	0.09	0.09	0.06	0.06	0.04	0.07
1993	0.57	0.71	0.91	0.85	0.57	0.71	0.67	0.84	0.73	0.75	0.87	0.87
1994	0.13	0.46	0.56	0.55	0.64	0.79	0.87	0.75	0.87	0.91	0.85	0.83
1995	0.06	0.03	0.04	0.06	0.22	0.72	0.78	0.73	0.80	0.85	0.80	0.70
1996	0.11	0.20	0.15	0.15	0.25	0.20	0.28	0.40	0.29	0.51	0.36	0.29
1997	0.93	0.86	0.55	0.28	0.56	0.25	0.11	0.27	0.25	0.18	0.16	0.11
1998	0.96	0.77	0.94	0.96	0.82	0.90	0.85	0.89	0.85	0.71	0.74	0.64
1999	0.86	0.71	0.78	0.60	0.37	0.67	0.62	0.56	0.72	0.84	0.71	0.65
2000	0.12	0.58	0.99	0.94	0.94	0.85	0.90	0.82	0.74	0.87	0.91	0.85
2001	0.21	0.13	0.44	0.83	0.93	0.92	0.94	0.98	0.98	0.98	0.98	0.98
2002	0.60	0.89	0.83	0.72	0.91	0.91	0.67	0.48	0.65	0.62	0.64	0.60
2003	0.52	0.40	0.37	0.20	0.14	0.21	0.49	0.88	0.91	0.87	0.79	0.81
2004	0.35	0.35	0.63	0.48	0.33	0.48	0.46	0.72	0.59	0.38	0.26	0.26
2005	0.44	0.22	0.24	0.22	0.11	0.07	0.07	0.06	0.13	0.11	0.16	0.18
2006	0.13	0.65	0.50	0.49	0.44	0.22	0.24	0.17	0.24	0.20	0.15	0.16
2007	0.98	1.00	0.92	0.92	0.95	0.96	0.95	0.96	0.97	0.97	0.96	0.96
2008	0.67	0.91	0.87	0.96	0.85	0.93	0.84	0.82	0.65	0.54	0.48	0.67
2009	0.24	0.16	0.18	0.15	0.18	0.28	0.20	0.20	0.17	0.24	0.28	0.40
2010	0.15	0.06	0.06	0.09	0.19	0.20	0.36	0.77	0.68	0.56	0.45	0.55
2011	0.78	0.64	0.25	0.11	0.15	0.26	0.13	0.12	0.11	0.13	0.18	0.13
2012	1.00	0.98	1.00	0.99	0.93	0.84	0.80	0.65	0.45	0.42	0.57	0.51
2013	0.22	0.35	0.28	0.45	0.34	0.40	0.64	0.76	0.85	0.80	0.76	0.88
2014	0.53	0.70	0.89	0.82	0.98	1.00	0.99	0.99	0.99	0.99	0.98	0.98
2015	0.20	0.40	0.18	0.08	0.10	0.16	0.14	0.27	0.33	0.27	0.35	0.28
2016	0.76	0.88	0.85	0.91	0.92	0.97	0.93	0.87	0.84	0.78	0.88	0.86
2017	0.47	0.52	0.22	0.26	0.29	0.35	0.16	0.18	0.09	0.12	0.07	0.04
2018	0.01	0.05	0.26	0.69	0.56	0.57	0.65	0.58	0.35	0.40	0.42	0.58
2019	0.80	0.51	0.40	0.47	0.52	0.29	0.39	0.44	0.33	0.30	0.30	0.25
2020	0.60	0.14	0.26	0.26	0.79	0.88	0.92	0.91	0.94	0.96	0.96	0.95
2021	0.84	0.96	0.82	0.65	0.64	0.67	0.75	0.69	0.90	0.82	0.90	0.87
2022	0.25	0.29	0.13	0.17	0.29	0.11	0.15	0.08	0.14	0.15	0.10	0.15
2023	0.31	0.37	0.51	0.89	0.69	0.83	0.89	0.94	0.96	0.94	0.93	0.84
2024	0.07	0.38	0.60	0.89	0.99	0.98	0.98	0.98	0.98	0.98	0.99	0.99
2025	0.36	0.10	0.04	0.02	0.06	0.22	0.16	0.22	0.30	0.72	0.69	0.73