

# River Test Drought Permit Application

## 1.4 Evidence the Company has followed its Drought Plan

19 July 2022



from  
**Southern  
Water** 

# Contents

Contents	2
1 Introduction	4
1.1 The drought permit application documents	4
1.2 Objectives of this document	5
2 Our drought plan and the Section 20 agreement	6
2.1 Our drought plan	6
2.1.1 Drought Plan 2019 and Drought Plan 2022	6
2.1.2 Expected actions within our drought plan	6
2.2 The Section 20 agreement	8
2.2.1 Expected actions under section 20 agreement	8
3 How we have followed our Drought Plan and the Section 20 agreement	10
3.1 Water resource situation monitoring	10
3.1.1 Triggers	10
3.1.2 Drought progression and drought permit and management milestones	10
3.2 Environmental monitoring and mitigation	11
3.3 Water efficiency, communications and customer engagement	12
3.3.1 Water efficiency communications during spring and summer 2021	12
3.3.2 Water efficiency campaign during autumn to winter 2021–22	13
3.3.3 Water efficiency home visits	13
3.3.4 Water for Life Hampshire	14
3.3.5 Other water efficiency measures	14
3.3.6 Education	14
3.3.7 Water efficiency communications during spring and summer 2022	15
3.3.8 Targeted campaign for 2022 River Test drought permit	15
3.4 Leakage management	16
3.4.1 Leakage levels	16
3.4.2 Leakage management activities	20
3.5 Management of outage	24
3.5.1 Outage during the drought	24
3.5.2 Effects of outage on supplies and the supply-demand balance	26
3.5.4 Plans for further outage recovery	27
3.5.5 Resource benefits of outage recovery	30
3.6 Household metering and per capita consumption	30
3.7 Other actions	31
3.7.1 Management of transfers and bulk supplies	31
3.7.2 Other actions undertaken to manage resources or reduce demand	32
3.7.3 Other actions considered and rejected to manage resources or reduce demand	32

3.7.4	Benefits of the permit	32
3.8	Consequences if the permit is rejected	32
3.9	Implementation of TUBs	33
3.9.1	Discussion of decision making about implementation of Temporary Use Bans (TUBS)	33
3.9.2	Evidence of effectiveness of TUBs	35
3.9.3	Implementation of TUBs	35
3.10	Summary of actions in line with drought plan	36

References		37
------------	--	----

Table 1	Document structure for drought permit application	4
Table 2	Drought management actions expected in Section 20 Agreement	8
Table 3	Drought permit process timeline following the 35-day trigger as in the S 20 agreement	9
Table 4	Recent changes in leakage detection field resources	20
Table 5	Summary of advanced pressure management schemes and progress	21
Table 6	Summary of Average Zonal Night Pressures and changes 2020-21 to 2021-22	23
Table 7	Summary of leakage reduction benefits (MI/d) of recent pressure management schemes	23
Table 8	Outage performance for Hampshire and the Isle of Wight in June 2022, using WRMP calculation procedure	25
Table 9	Outage definitions by category	26
Table 10	Outage recovery plan for Western Area (July 2022)	27
Table 11	Potential demand savings from implementing Temporary Use Ban	34
Figure 1	Linking drought triggers and actions	7
Figure 2	Hampshire Leakage Dashboard	17
Figure 3	Leakage levels for Hampshire water resource zones	18
Figure 4	Isle of Wight Leakage Dashboard	19
Figure 5	Summary of current apportionment of pressure management systems	22
Figure 6	Outage performance since April for the whole company	26
Figure 7	Per capita consumption versus meter penetration	31

# 1 Introduction

Southern Water is applying for a drought permit under Section 79A the Water Resources Act (WRA) 1991 to make temporary amendments to abstraction licence 11/42/18.16/546 to abstract water from the River Test.

## 1.1 The drought permit application documents

This document is part of a suite of documents (see Table 1) which form the application for the drought permit and based on the requirements set out in Appendix E of the Drought permit guidance (EA, 2021).

**Table 1 Document structure for drought permit application**

Document Set 1 Drought Permit Proposals	
<b>Document 1.1</b>	<b>Description of the proposals</b>
Appendix 1	Draft Permit 2019
Appendix 2	Section 20 Agreement
Appendix 3	Summary of the Section 20 Agreement
Appendix 4	Monitoring plan
Appendix 5	Mitigation Plan
<b>Document 1.2</b>	<b>Reasons for the permit</b>
Appendix 1	Abstraction, DI and transfer Data
<b>Document 1.3</b>	<b>Exceptional shortage of rain (ESOR) case</b>
<b>Document 1.4</b>	<b>Evidence the Company has followed Drought Plan</b>
Appendix 1	Drought Communication Plan
Appendix 2	Effectiveness of Restrictions
Document Set 2 Environmental Reports	
<b>Document 2.1</b>	<b>Environmental Statement</b>
<b>Document 2.2</b>	<b>Monitoring and Mitigation Plan</b>
Appendix 1	Fish Monitoring Mitigation Plan
Appendix 2a	Water Quality Monitoring
Appendix 2b	Redacted Water Quality Monitoring Locations
<b>Document 2.3</b>	<b>Section 20 monitoring and mitigation progress</b>
<b>Document 2.4</b>	<b>HRA – Test surface water drought permit stage 2</b>
<b>Document 2.5</b>	<b>EAR (Appendix B of Drought Plan)</b>
<b>Document 2.6</b>	<b>EAR (appendix D of Drought Plan)</b>
Document Set 3 Consultation	
<b>Document 3</b>	<b>Consultation</b>
Appendix 1	Testwood Abstraction Licence
Document Set 4	
<b>Document 4.</b>	<b>General Summary</b>

## 1.2 Objectives of this document

This document demonstrates that the company has managed its operations appropriately during the preparation and application for this drought and ready for operation within it. The company has:-

- Followed its drought plan, including its triggers and expected actions;
- Engaged customers and enhanced water efficiency promotion;
- Enhanced leakage reduction activity;
- Effectively managed outage;
- Considered other options and risks;
- Considered, prepared and appropriately implemented water use restriction with respect to the Hampshire Section 20 Operating Agreement with the Environment Agency.

## 2 Our drought plan and the Section 20 agreement

### 2.1 Our drought plan

#### 2.1.1 Drought Plan 2019 and Drought Plan 2022

Southern Water published its current Drought Plan on 1st July 2019. A revised plan is in final draft stage, likely to be published shortly as Drought Plan 2022.

We published the draft new 2022 Drought Plan for consultation in June 2021. The consultation period extended from 7 June to 2 August, and we received responses from 26 individuals and organisations, as well as feedback from webinars, customers and other engagement. On 28 September 2021 we published our statement of response which sets out how we expect to address the comments we have received on the draft plan and we have now revised the plan itself, ready for publication, awaiting agreement from the Environment Agency (EA) and Defra.

This drought permit application is consistent with our current published Drought Plan and the new 2022 Drought Plan. The Section 20 Operating Agreement (S 20) protocol is included in the same way in the current plan and our new plan. In respect of procedure and actions with respect to the River Test Drought Permit and the overall protocol of the S 20, the 2019 and 2022 Drought Plan are equivalent.

The only difference is the river flow levels that we use as triggers for progress through the stages of the River Test drought permit application from internal preparation, via draft application to final application.

For this permit application we have chosen to work to the revised triggers of the new Drought Plan. These are more conservative than the triggers set in the 2019 drought plan. That is, higher river flows are used as the trigger for draft application submission and final application submission. We believe it is sensible to proactively adopt implementation of the new triggers.

#### 2.1.2 Expected actions within our drought plan

The actions which we expect to take as a drought progresses are set out in Figure 1. These actions are in line with the expectations set out in the Section 20 agreement, as set out in Section 2.2 below.

Figure 1 Linking drought triggers and actions

Drought Level	Trigger Status	Drought Actions
<b>Normal Conditions</b>	▪ River Test Flows > 90 day Triggers	<ul style="list-style-type: none"> <li>▪ Routine drought monitoring</li> <li>▪ Normal Patterns of abstraction under Sustainable Abstraction Policy</li> <li>▪ Normal Water Efficiency Actions</li> <li>▪ On recovery conduct lessons learned review</li> </ul>
	▪ River Test Flows < 90 day Triggers	<ul style="list-style-type: none"> <li>▪ Begin River Test DP Internal Preparation</li> </ul>
<b>Level 1</b> Minor or developing drought	▪ River Test Flows < 60 day Triggers	<ul style="list-style-type: none"> <li>▪ Increased Water Efficiency Messaging</li> <li>▪ River Test Drought Permit Pre-Consultation with Environment Agency</li> <li>▪ Reduce transfers out of HSW (to HSE, IoW)</li> <li>▪ Increased leakage reduction activity in WRZ</li> <li>▪ Activate Portsmouth Water Bulk Supply</li> <li>▪ Engagement with Local Authorities</li> </ul>
	▪ River Test Flows < 35 day Triggers	<ul style="list-style-type: none"> <li>▪ Submit River Test Drought Permit</li> <li>▪ Section 20 Annex 2 Timeline Activities</li> <li>▪ Pre-consultation on River Test Drought Order (stage 1 – HoF to 265MI/d)</li> <li>▪ Begin River Test DO Internal Preparation</li> </ul>
<b>Level 2</b> Drought	▪ River Test Flow <=355 MI/d	<ul style="list-style-type: none"> <li>▪ Temporary Use Bans</li> <li>▪ Mains pressure reduction management and Distribution Network Modifications</li> <li>▪ Submit application for River Test Drought Order (Stage 1 – HoF to 265MI/d)</li> <li>▪ Pre-consultation and submission for Level 3 Phase 1 Restrictions Drought Order</li> </ul>
<b>Level 3</b> Severe Drought	▪ River Test Flows < 310MI/d	<ul style="list-style-type: none"> <li>▪ Implement Level 3 Phase 1 Restrictions Drought Order Restrictions</li> <li>▪ Pre-consultation for River Test Drought Order (HoF to 200MI/d)</li> <li>▪ Submit River Test Drought Order (Stage 2 – HoF to 200MI/d)</li> <li>▪ Pre-consultation and submission for Level 3 Phase Restrictions Drought Order</li> </ul>
	▪ River Test Flows < 265MI/d	<ul style="list-style-type: none"> <li>▪ Implement Level 3 Phase 2 restrictions Drought Order</li> <li>▪ Implement t River Test Drought Order (Stage 2 – HoF to 200MI/d)</li> </ul>
<b>Level 4</b> Extreme Drought	▪ River Test Flows < 200MI/d	<ul style="list-style-type: none"> <li>▪ Emergency Drought Orders</li> </ul>

Note this figure is taken from our draft Drought Plan (2022) to be finalised and published in 2022, however the actions are the same as expected in our current Drought Plan (2019)

## 2.2 The Section 20 agreement

The Section 20 (S 20) agreement between Southern Water and the EA was signed in April 2018 as the outcome of the public inquiry into the EA proposed abstraction changes to Southern Water abstraction licences on the River Test and the River Itchen.

The aspects of the S 20 agreement most pertinent to this Drought Permit application are summarised in Section 2.1.1 below. A fuller summary of the context and function of S 20 agreement is provided in Appendix 3 of the Description of the proposal, document ref: **1.1\_App 3 Summary of the Section 20**.

### 2.2.1 Expected actions under section 20 agreement

A key element of the S 20 agreement includes the expected sequencing of drought interventions in the catchments of the River Test and River Itchen, as shown in Table 2 below. This set of actions is intended to progress as a drought develops and becomes more severe. Following optimisation of our resources, and initiation of the bulk supply from Portsmouth Water to our Southampton East zone, we would escalate demand side water efficiency measures. The timeline for actions in relation to the River Test drought permit as set out in the S 20 agreement is shown in .

The Testwood drought permit (this application) is expected to be the earliest formal supply-side drought measure in Hampshire. The drought permit is to be implemented following the imposition of level 2 water restrictions (temporary use bans). The S 20 agreement provides for restrictions to be required to be in place only just before implementation of the permit.

**Table 2 Drought management actions expected in Section 20 Agreement**

Ref	Activity	Comment
1	Utilisation of SWS water sources and bulk supplies	Prior to any application for a drought permit or order, SWS will utilise its own existing water sources available to supply the Hampshire and Isle of Wight Water Resource Zones within the terms of their respective licences. This will include water available under the Portsmouth Water bulk supply scheme.
2	Level 1 water use restrictions	Escalate demand-side water efficiency measures including media campaigns
3	Level 2 water use restrictions	Implement partial temporary use bans (TUBs) pursuant to section 76 IA 1991 unless it is agreed with the Environment Agency that it is unnecessary because savings will be minimal
4	Test Surface Water Drought Permit	Abstract from Test Surface Water below the Environment Agency's proposed Total Test Flow (TTF) Hands off flow (HoF) of 355 MI/d down to 265 MI/d pursuant to a drought permit

5	Level 3 water use restrictions	Apply for a drought order to authorise partial Non-Essential Use (NEU) restrictions (Level 3 phase 1 drought restrictions).		
Ref	Activity			
	Candover augmentation scheme	Test Surface Water drought order	Level 3 phase 2 drought restrictions	Lower Itchen drought order
6	When flows fall below 205 MI/d at Allbrook and Highbridge on the River Itchen	When TTF falls below 265 MI/d abstract down to a baseline of 200 MI/d pursuant to a drought order	When flows fall below 200 MI/d at Allbrook and Highbridge implement full TUBs and NEUs (Level 3 phase 2 drought restrictions).	When flows fall below 198 MI/d at Allbrook and Highbridge, as a measure of last resort, abstract below the 198 MI/d HoF to a floor of 160 MI/d. Coincident with this, Portsmouth Water will also need to abstract below the Riverside Park HoF of 194* MI/d.

**Table 3 Drought permit process timeline following the 35-day trigger as in the S 20 agreement**

Number of days after 35-day trigger is breached*	Action
0	The Company applies to the Agency, publishes last advertisement of application (if more than one advertisement is required) and gives notice of hearing on day 11.
1-2	The Agency acknowledges receipt, contacts PINS/EA officer from another area/Counsel, and secures potential venues
7	Deadline for any objection
8-9	The Agency decides if a hearing is necessary
11	Hearing (into non-ESOR matters). Hearing adjourned.
15	The Company gives ESOR update (could be day 16 or 17)
19	Reconvened hearing on ESOR
25	Latest date for Agency to receive report on application.
29	The Agency uses reasonable endeavours to issue a decision whether to grant a drought permit
34	Agency’s decision on whether to grant a drought permit (long stop)
35	The permit is implemented if flows fall below 355 MI/d on the River Test and the Company continues abstraction.

\*Note the 35-day trigger for the Drought Permit application is based on a ‘worst case’ assessment of flow recession. The recession may be slower, or subsequent rainfall events may delay the recession. The day on which the 355 MI/d HOF condition is breached may therefore occur after 35 days, or not occur at all depending on subsequent rainfall in the catchment. However, it is also possible flows could recede faster than expected by the 35 day trigger.

## 3 How we have followed our Drought Plan and the Section 20 agreement

### 3.1 Water resource situation monitoring

We have been monitoring the water resources situation in the catchment, following various metrics including rainfall, river flows and groundwater levels. Our monitoring of rainfall, river flows and groundwater indicators of the progression of the drought in the River Test catchment are presented in Section 3 of document 1.2 Reasons for the permit, where we also include forecasts of how the drought could progress. Our forecasts are based on weather forecasts available for the short term (two weeks ahead), together with climatic ensembles for medium term forecasts. These are used in conjunction with hydrological and groundwater models to assess the potential impacts of further dry weather on river flows and available resources in the catchment. We also assess risk of shortfall of supply to customers, maintenance of public water supply being the purpose of the permit.

#### 3.1.1 Triggers

For our Drought Plan, we have developed river flow triggers in alignment with the requirements of the Section 20 agreement, as described in Section 3.3 of document 1.2 Reasons for the permit.

We have three main triggers in relation to flows on the River Test which guide actions in advance of operationally requiring a drought permit should flows drop below the 'Hands-off flow' condition of the Testwood abstraction licence.

The '90-day' trigger is an internal trigger for us to begin preparing our drought permit application and preparing for the drought actions we need to take. We keep the EA and NE informed of crossing this trigger, but formal consultation and engagement does not start at this point.

The '60-day' trigger is the point at which we start formal consultation with the EA and NE and, begin engagement with other stakeholders in the catchment. We also start to ramp up our water efficiency measures and, manage our operations and bulk supplies to conserve water within the River Test supply zone. We have agreed with the EA and NE that we should provide them a full draft application upon crossing the '60 day' trigger.

The '35-day' trigger is the point at which we need to submit a formal drought permit application. From this point, there is a 35-day timeline for determination of the application, as set out and agreed in the S 20. This includes the advertisement of the application, potential receipt of formal objections, the option for the EA to call a Public Hearing and, the subsequent time the EA needs to determine the application.

#### 3.1.2 Drought progression and drought permit and management milestones

We first crossed our 90-day River Test flow trigger (Drought Plan 2022) on 3rd June 2022. In response, we started preparation for a drought permit application, and informed the EA and NE.

We crossed the 60-day trigger (Drought Plan 2022) on 21st June. We informed the EA and NE and confirmed a first "pre-application" meeting to take place 24th June, suiting EA and NE availability, with agreement that draft application documents were to be provided for the meeting. River flow rose above the 60-day trigger temporarily on 22nd - 23rd June but fell below again on 24th – 25th June. Before and after submission of the draft application, river flow forecasting shared with the EA consistently indicated that the 35-day trigger for submission of the final application would be crossed on or around 18th July and EA and NE feedback on the draft application and our

finalisation of the application was scheduled on that basis. However, the river fell more sharply crossing the 35-day trigger on 10th July, related to higher abstraction necessary in response to higher demand due to exceptionally hot weather. We submitted the final application to the EA on 19th July as previously agreed with the EA.

Based on latest river flow forecasts but subject to regular update and review of those and wider drought risk considerations that may escalate, the further schedule following submission of the application will be: -

- 7-day public consultation period, when third party objection can be raised to the EA - 21<sup>st</sup> to 27<sup>th</sup> July
- Potential Public Hearing, if required by EA - w/c 1<sup>st</sup> August;
- Advertisement of temporary use ban - 12<sup>th</sup> August;
- Implementation of temporary use ban - 19<sup>th</sup> August;
- EA determines drought permit application - 22<sup>nd</sup> August;
- Operational implementation of the drought permit - 25<sup>th</sup> August.

Throughout this period and after operational implementation Southern Water will continue enhanced promotion of water efficiency and deployment of enhanced resource to targeted further reduction of network leakage. We will also minimise the required abstraction at Test Surface Water as much as possible, especially by minimisation transfers out of the Southampton West supply area, while considering consequent impact on the River Itchen and water supply risks there and on the Isle of Wight.

We will also continue to monitor the River Test flow, the wider hydrological and weather situation and, local and wider water demand. We will keep our forecasts up to date in dialogue with the EA. In submitting this application on 19<sup>th</sup> July as previously scheduled, the recent exceptionally hot weather is persisting and water demand remains high, with consequent need to continue higher than usual abstraction from the River Test. (The scale of the recent temperature increase and its effect on water demand has far out-weighed the reduction of demand possible by our promotion of efficient, environmentally considerate use of water). If the weather returns to more normal temperatures and demands fall back to more normal level, we will also be able to be reduce the abstraction to more usual levels and the river flow should recover some of the most recent large drop. However, forecasting from the current river flow as if the current situation persists, it is likely that the August dates in the schedule above will come forward by up to two weeks, including the timings related to temporary use bans.

## 3.2 Environmental monitoring and mitigation

We have submitted a suite of environmental assessment documentation in respect of the drought permit application. These are consistent with the environmental assessment and monitoring and mitigation plans supporting our Drought Plan. The documents submitted with the drought permit application are listed in our Environmental Statement, document ref: 2.1 Environmental Statement.

The monitoring and mitigation plan (document ref: 2.2 Monitoring and mitigation plan) submitted with the permit application focuses on the environmental monitoring and mitigation to be carried out during the period of the permit. It is complementary to the permanent (baseline) monitoring and permanent mitigation work packages agreed with and implemented for the S 20. These agreed work packages are also appended with the drought permit application as document ref: 1.1 App 4 Monitoring Plan and document ref: 1.1 App 5 Mitigation package. These permanent measures provide the primary monitoring and mitigation approach, agreed to be satisfactory for the River Test drought permit by the EA and Natural England.



## 3.3 Water efficiency, communications and customer engagement

Southern Water has a history of proactive industry leading activity in respect of customer demand management: - Implementing a domestic customer metering programme between 2010 and 2015 and has pursued further metering since 2015; the Western Area is now 91% metered.

Commenced promotion of an industry leading target ('target 100') to establish average customer consumption of not more than 100 litres per head by 2040 and, down to 80 litres per head by 2050.

Southern Water has also progressed household metering in recent years, especially between 2010 and 2015, with further progress since; overall, 88 % of customers are metered and 91% in Western Area.

### 3.3.1 Water efficiency communications during spring and summer 2021

#### *Behaviour change at scale*

Through a combination of 'Always On' and targeted engagement we're already focused on a series of behaviour change communications campaigns in our 'stressed' water resource zones, divided into East, Central and West for tracking purposes. We work to an 'engage, explain, assist' approach.

Our seasonal campaigns are looking to engage customers, through digital media campaigns and outdoor advertising when water use is front of mind over the spring and summer, explain key issues via blogs, editorial thought leadership during the autumn and winter. At the same time, with every interaction, we make sure we assist in changing behaviour by 'nudging', including practical advice and tips – via radio, door drops and emails.

So far, we have completed two waves of campaign activity, the first 'Always On' phase during the start of the pandemic focused on providing support, guidance and reassurance. Our most recent campaign throughout the summer of 2021, has spread our #ItAllMakesADifference messaging across both our 'Always On' channels and targeted streams in our most-water stressed areas, covering print, radio, digital, outdoor (bus, rail and billboard sheets) and TV, as well as several face-to-face events in the Central area. In total we have delivered more than 11 million impressions and 2.5 million direct communications, and we have seen water efficiency awareness levels of: West 53%; Central 56%; East 46%.

#### *Forging community partnerships*

To support the core campaign, we've also entered several community partnerships, joining Southampton City Council's Green City partnership in February 2021, which allowed us to share our 'save water, energy and reduce your carbon footprint' messaging via the council's core channels, at the same time as promoting our free Water-Saving Home Visits. This partnership is continuing across 2022.

We also partnered with Kent County Council (and South East Water) to reach out to our vulnerable customers in Thanet area to support with free Water-Saving Home Visits and share water-saving messages via social media over the summer months. This partnership is continuing throughout 2022



Our partnership with City to Sea continued, building on the success of our sponsorship of Rethink Periods (plastic-free periods education initiative), with the development of our 'Rethink Water' education pilot.

### 3.3.2 Water efficiency campaign during autumn to winter 2021–22

#### *Targeted campaign*

We prepared and delivered a four-month campaign to take place between December 2021 and March 2022 to support the refill period and help our water sources recover during the cooler, wetter months. The campaign targeted four key areas: Hampshire and the Isle of Wight, Brighton and Horsham.

Key messages were created to appeal to audience demographics and their motivations. The four key drivers:

The messages encourage customers to save water during the cooler months to:

- protect the local environment by allowing natural water sources to recover
- reduce household costs during the costly winter/festive period
- make sure everyone has enough of water to stay cool next summer
- save the planet by decreasing their carbon footprint.

These messages were delivered through a range of online and traditional channels based on the preferences of audience segments, including:

- Direct mail and email
- Outdoor advertising including bus rears, train stations, shopping centres and billboards
- Digital, radio and social media advertising
- Sponsored media content
- Face-to-face engagement in public spaces and through community organisations

#### *Harnessing media and education*

We used our media partnerships to spread the message across our region that saving water now will help our water sources recover for when the warmer weather returns.

In October 2021, our Rethink Water pilot began. We worked with Southampton City Council and our Data team to identify 10 schools in the Southampton city area to take part. Education materials were created for a provisional launch in mid-October.

### 3.3.3 Water efficiency home visits

Southern Water has a long-term targeted programme of free water saving home visits across Hampshire. These are open to metered customers to request a visit who fit the high usage criteria, and who are expected to benefit most from a visit.

Each visit is designed to offer bespoke behaviour change advice alongside fitting of free water saving products throughout the house to ensure maximum water and energy savings for the customer. Each visit involves tracking of actual water use both before and after the visit. Visits have demonstrated reductions in water usage just from the behavioural advice given. Free fixing of leaky loos is also included within the home visits, which can save up to 300 litres/day per toilet. Waterbutts are also being offered as a pre-arranged fitted device at the home visit.

Home visits were stopped during each of the Covid lockdowns but as soon as the contractor was able, visits continued, following appropriate Government PPE requirements. Home visits became

possible again following Government guidelines on PPE in July 2020 after lockdown 1 and then again after lockdown 2 in April 2021.

### 3.3.4 Water for Life Hampshire

Under the Water for Life Hampshire campaign, the catchment has concentrated water efficiency activity and the number of customer contacts and visits across Hampshire and the Isle of Wight since April 2020 (to 21st June 2022) are as follows:

- Total Customers Contacted – 7819
- Total Audits Completed - 2601
- Total Products Installed – 3846

### 3.3.5 Other water efficiency measures

Southern Water has also been exploring other related packages that expand both the reach of the programme and how customers relate to their water use to make it easy for them to save water, energy and money too and improve the environment. These activities have included working closely with local authorities, communities, parish councils and other stakeholders such as the Wildlife Trusts.

Southern Water have launched the Get Water Fit water calculator tool to help customers understand how much water they use and how they use it. Freepacks of water saving devices are sent to customers following answers given. Virtual visit calls are offered and water saving products sent prior and checked if fitted on the call, along with advice given. The calculator also allows customers to complete challenges to earn coins to donate to local schools and WaterAid. Toilet leaks are referred back to Southern Water to ensure they have a physical home visit where the toilet leak is fixed.

### 3.3.6 Education

Southern Water is working in partnership with Hampshire and Isle of Wight Wildlife Trust Watercress and Winterbourne team in the seven headwater catchments of the Rivers Test and Itchen to develop their 'Save Every Drop' education project. The five-year Lottery funded project will raise awareness of the connection between the water we use and the flows and health of the local chalk stream, by encouraging and promoting reducing water usage.

Southern Water have provided training sessions for the HIWWT volunteers who will be attending local events and door knocking. We will also be jointly creating educational resources. A range of media will be used, including a film that is already online, to promote the home visits.

Due to the pandemic, our programme of Waterwise talks to schools, groups and adult groups were cancelled, however five Zoom talks were still given in the last year in Hampshire and over 20 are planned now schools and groups have returned to a form of normality. Promotion of these educational talks is ongoing.

### 3.3.7 Water efficiency communications during spring and summer 2022

#### *Promoting water scarcity alongside targeted behaviour change*

We are now delivering our third wave of activity this summer utilising the same mix of Always On and targeted channels. This year, we are running two elements within our campaigning – promoting that water scarcity is an issue across the South East along with tips and practical advice on how everyone can play their part to save more, and then more targeted messaging, concentrated on one of our most water-stressed areas of Southampton with the same engage, explain, and assist approach as previous years, again via radio, door drops, emails, and outdoor advertising.

Alongside this campaign activity will be integrated communications pertaining to drought permit communications via the same mix of channels but targeted to the affected areas of Hampshire and the Isle of Wight. This activity will be ramped up with messaging becoming more targeted around the following key messages of ‘Please use water wisely so there’s enough to go around’, during pre-drought, and then a ramp up of rhetoric as we go through the stages focused around ‘We can’t afford to waste water, we need to use it wisely to ensure everyone has enough’. Specific channels that will be used are Always On: radio, DAX, digital and display, and editorial; direct email, door drops and paid social media. Throughout the campaign we will continue to assess the effectiveness of our messages.

### 3.3.8 Targeted campaign for 2022 River Test drought permit

Our specific communications plan for the 2022 River Test drought permit is shown in document ref: **1.4\_App\_1\_Drought Communications Plan**.

This includes use of our website, proactive use of social media, targeted mail drops and bulletins via conventional media. Implementation will be directly by Southern Water but also in partnership with others. For example, working with eh WaterUK campaign “waters worth saving” and, through our sponsorship and support to the Hampshire and Isle of Wight Wildlife Trust managed “Water cress and Winterbournes” project, within which there is dedicated water efficiency promoting workstream,

There will be strong emphasis on encouraging wise, efficient use of water, with the message tone escalating if the resource situation and risk escalates, including accommodating lead into possible water use restrictions and covering their implementation should they become necessary.

We will provide updates of the plan to the EA approximately weekly, within which we will quantify the reach and customer engagement of the various measures implemented. We started providing these updates in July after providing the plan to the EA with our draft drought permit application pack on 24<sup>th</sup> June. The last update at time of finalising this drought permit application was provided to the EA on 14<sup>th</sup> July. This is the version of the plan and progress statistics included with the application as document ref: **1.4\_App\_1\_Drought Communication Plan and Activity Tracker**.

One indication of success of the campaign is the number of home visits we get booked, where-in we can directly advise on water saving and, offer and install water saving devices. So far to July 15<sup>th</sup>) the campaign has achieved 578 home visit bookings across the Southampton and Isle of Wight supply areas. Another indication of success is the 339 registrations to our ‘Get Water Fit’ platform.

The company will endeavour to determine the actual impact of the campaign on the prevailing demand, though it must be recognised that this is a very difficult issue as there are many variables at play and we note, not least, the campaign implementation period has been impacted by an

exceptional period of hot weather from July 7th to July 20th disturbing any baseline demand trend that we could have assessed impact of the campaign against.

We will also engage, via the Retailer(s), with any commercial customers that we supply as Wholesaler. Initial situation briefings, with request for support in efficient water use, were issued in July and we will follow up in line with the escalating situation. We have commenced specific discussion with a large commercial customer that we supply water to direct from our River Test Works and we hope to be able to achieve a reduction in what they require from us as we have done in similar circumstances in previous years. However, the customer does have strategic status our supply in full.

## 3.4 Leakage management

Southern Water has long had one of the Industry's lowest leakage levels but has proactively set new challenges to reduce leakage further, by setting itself the target of reducing leakage to 84.2 MI/d by 2025 (15% reduction from 2020) and a further 50% by 2040; this will keep the company amongst the very best in the industry in respect of leakage levels.

Our leakage data and information management systems are under continual improvement and innovative leak detection methods are being utilised to assist with our efforts including aerial photography, and satellite technology as well as working in unison with our competitors to share costs and be more effective as an industry.

### 3.4.1 Leakage levels

Our latest leakage dashboard for Hampshire is shown in Figure 2, the leakage levels for each of the Hampshire water resource zones is in Figure 3 and the leakage dashboard for the Isle of Wight is in Figure 4.

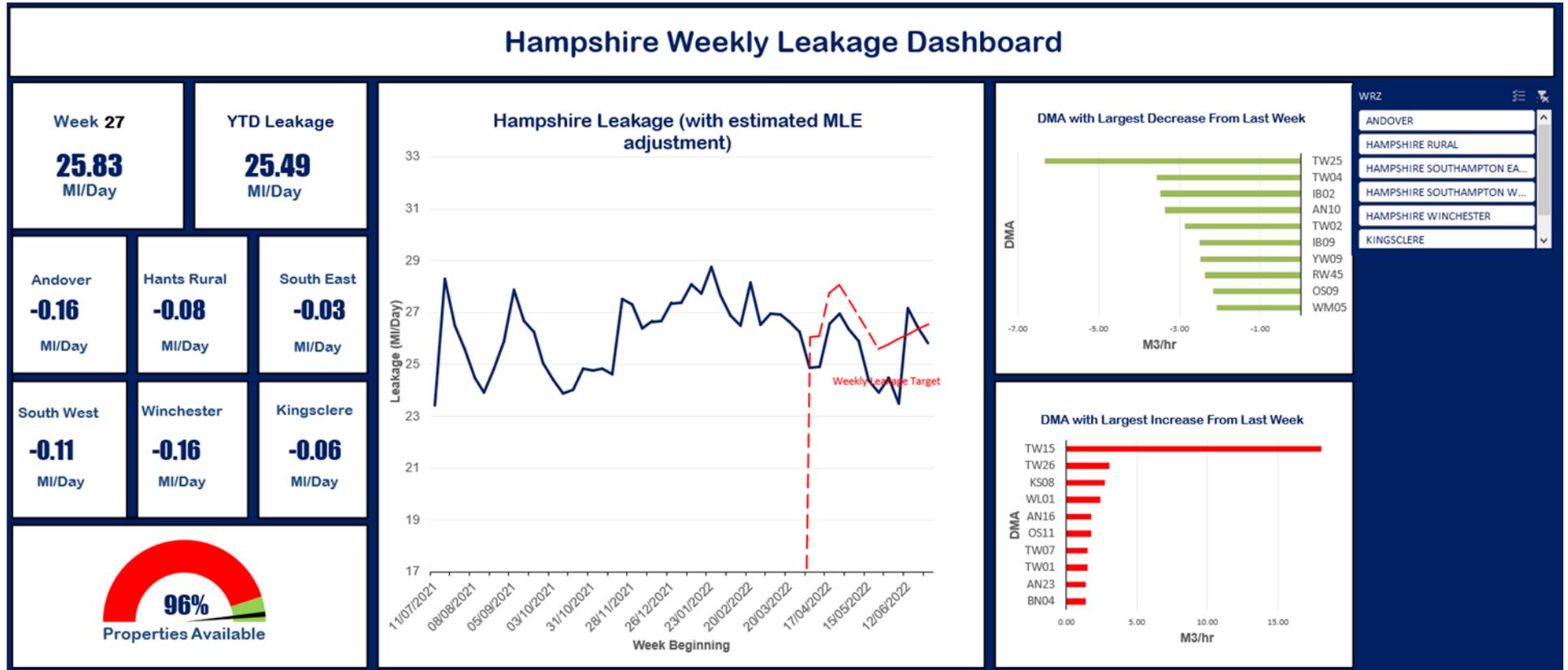
Current leakage levels vary from those included in the WRMP (2019) supply-demand balance forecast. The leakage total assumed in the WRMP for year 2022-23 for Hampshire is 26.11 Mld and for the Isle of Wight, 2.87 Mld; a total for Western Area of 28.98 MI/d. At end of June, 2022 actual leakage was 25.83 MI/d and 4.92 Mld; a total of 30.76 MI/d respectively.

The charts show that leakage has fluctuated throughout 2021 and 2022, with some large variability in leakage in Hampshire during 2021. However, since the beginning of the year in 2022, the trend for Hampshire has been for an overall reduction in leakage. Our ability to find and fix leakage was affected by Covid19 restrictions in 2020 and 2021 and current leakage levels still reflect some legacy of the Covid impacts.

The trend for the Southampton West resource zone shows slightly higher overall leakage levels in 2021 than 2022, with a steady decline in the leakage levels since the first half of April 2022.

We are providing regular (approximately weekly) leakage data updates to the EA during the drought permit period.

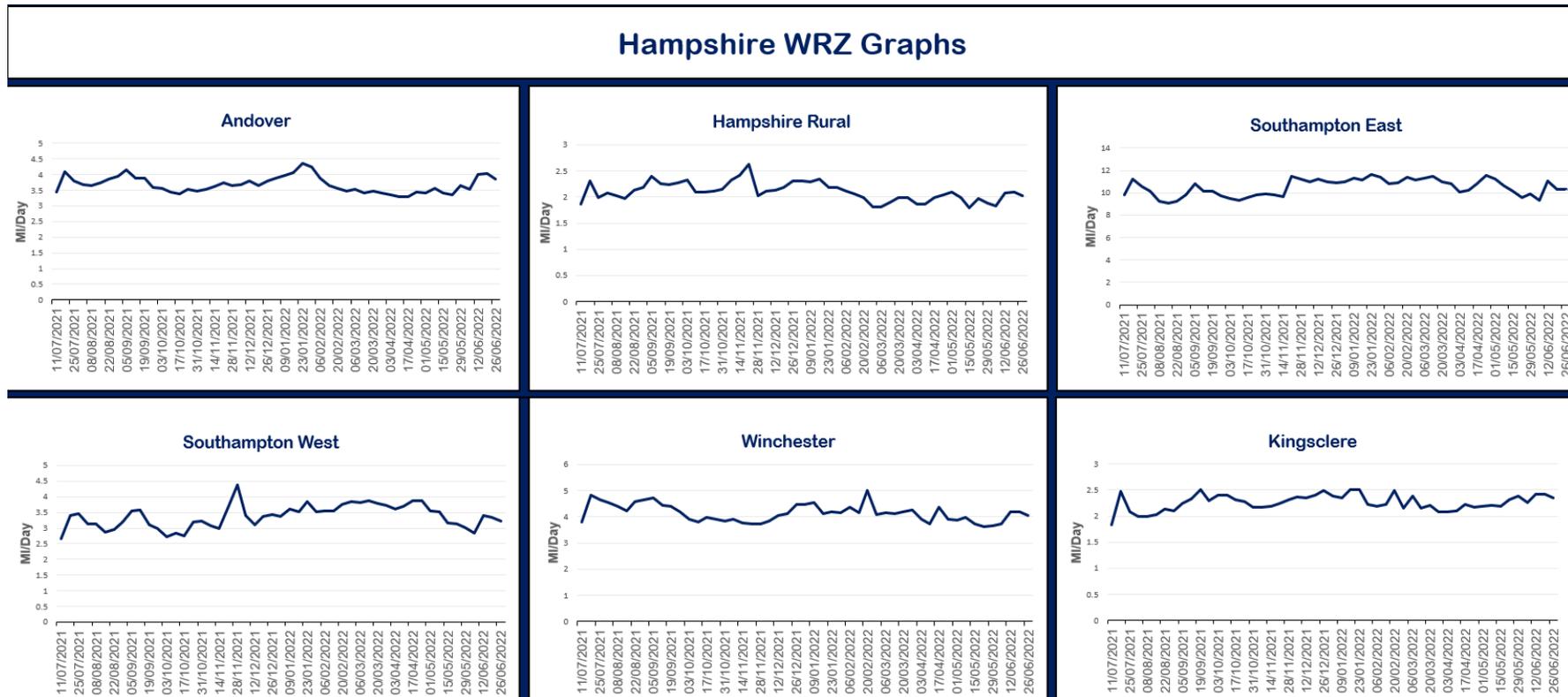
Figure 2 Hampshire Leakage Dashboard



River Test Drought Permit Application

1.4 Evidence the Company has followed its Drought Plan

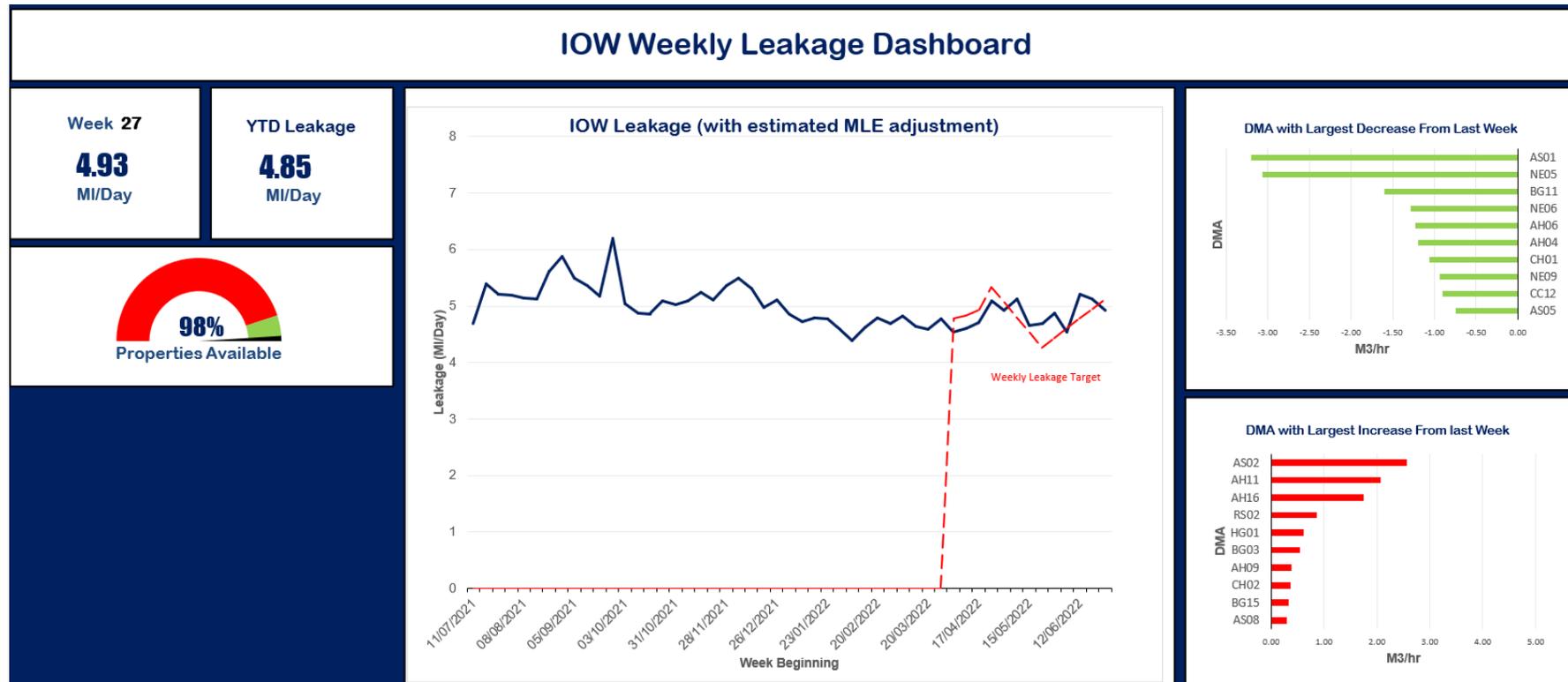
Figure 3 Leakage levels for Hampshire water resource zones



River Test Drought Permit Application

1.4 Evidence the Company has followed its Drought Plan

Figure 4 Isle of Wight Leakage Dashboard



### 3.4.2 Leakage management activities

We are working to enhance our leakage management activities in Hampshire and the Southampton area in response to this drought permit application and our overall improvement programme in leakage network digitalisation is helping our targeting of leakage reduction and repair response prioritisation as well as our deployment of transient logging and further deployment of pressure management.

Active leak detection resources are being further increased alongside the possible deployment of more acoustic loggers, implemented as a fixed network and 'lift and shift' correlating loggers. Acoustic loggers have been rolled out in South Hampshire as priority and their deployment is expected to help enhanced targeting of leakage reduction activity.

Our reduction enhancement plan is summarised below.

#### Active Leakage Control

We have increased field leak detection resources even though the labour market has been and remains unstable; retention and recruitment of new resources has been a challenge. Competition from neighbouring water companies and opportunities in a buoyant labour market in other sectors has seen our plan to increase skilled leakage technicians fall slightly behind plan despite increasing pay rates within our current framework agreement. Recent changes in field resource levels are shown in Table 4 below.

**Table 4 Recent changes in leakage detection field resources**

Number of Field Technician Resources Hampshire and the I.o.W.				
	I.o.W.	Target	Hampshire	Target
Mar-21	7	8	42	38
Sep-21	8	8	39	38
Jan-22	8	8	35	38
Mar-22	7	8	42	47
Jul-22	8	8	44	47

#### Leak Targeting and Repair Prioritisation

An initiative to drive and support all aspects of the leak repair prioritisation process to achieve leakage reduction benefits, especially by improving focus to reduce leak repair run times and specifically linked to the high-volume leaks. This is being achieved by sharing best practice, coordination of the planning and scheduling of repairs, close liaison with the local Highway Authorities, reporting and regular meetings with all interested stakeholders. Following a successful trial in the Sussex area this process has now been rolled out to Hampshire and the Isle of Wight

- High priority jobs repaired within 48hrs have increased to 83.3% from 66% at start of project
- The number of high value leakage works within the outstanding work basket that have not been completed within the required timeframe has decreased.

#### DMA targeting.

A process review to improve leakage resource targeting has commenced. This is expected to improve the leakage value of the created jobs, using enhanced analysis of data held within our leakage reporting software Waternet. This review sits within our aim to understand water usage

across all elements of the water balance calculation and assessment of operational water usage across all Southern Water sites.

Transient logging

Hampshire and the I.o.W. are included in the program of the deployment of our transient logging hardware to identify and prevent trunk main bursts and leakage.

Advanced Pressure Management Phase 1 & 2

We have an ongoing specific project to deliver a program of defined schemes to calm the network by the installation of new pressure reducing systems and the optimisation of existing ones on the network. Progress is summarised in Table 5 below in terms of schemes completed and ongoing within the Southampton West, Southampton East and Isle of Wight supply areas.

**Table 5 Summary of advanced pressure management schemes and progress**

Pressure Management Schemes by Area	Supply area						Totals		
	Southampton East		Southampton West		Isle of Wight				
	Complete	Ongoing	Complete	Ongoing	Complete	Ongoing	Complete	Ongoing	Total
Advanced Pressure Management	2	9				10	2	19	21
Calm Networks Phase 1	15	2	14	4	21	6	50	12	62
Pressure Transients	4						4		4
<b>Grand Total</b>	<b>21</b>	<b>11</b>	<b>14</b>	<b>4</b>	<b>21</b>	<b>16</b>	<b>56</b>	<b>31</b>	<b>87</b>

New pressure management schemes have been introduced in Southampton controlling the pressure to an extra 18,100 properties and 140km of mains since April 2019, reducing the frequency of leaks and bursts.

On the Isle of Wight, 3,600 properties and 36km of mains are now benefiting from being within new pressure management schemes in the same period.

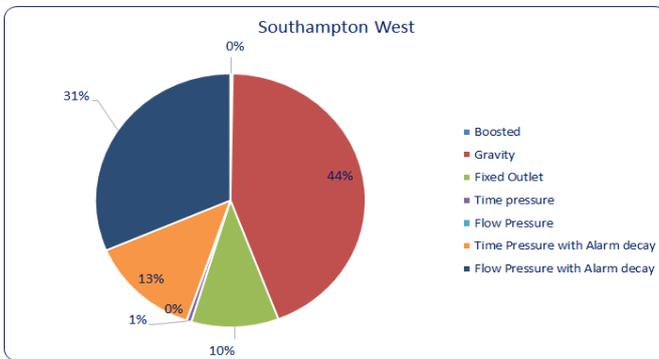
In addition, schemes in the planning phase, will add a further 13,300 properties and 74km of mains to pressure managed areas in Southampton.

The overall aim of our pressure management programme is to install pressure management to previously uncontrolled “gravity” supplied areas and to move to advanced dynamically controlled pressure management rather than more static controls. The hierarchy of pressure management system improvement being from ‘boosted’ through ‘gravity’, ‘fixed outlet’, ‘time pressure’, ‘flow pressure’, to the most advanced ‘time pressure with alarm decay’ and ‘flow pressure with alarm decay’. Our Calm Networks project has converted many previously fixed outlet pressure management areas to advanced pressure control systems, to further enhance the benefits of pressure management in these areas. 27% of properties in Southampton and 38% of properties in the Isle of Wight are under some form of advanced pressure management. The current overall apportionment of system of pressure control in the Southampton West, Southampton East and Isle of Wight supply areas is shown respectively in Figure 5 (a), (b) and (c) below.

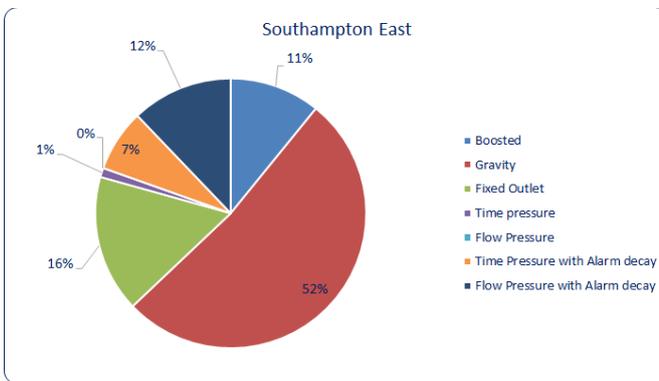


Figure 5 Summary of current apportionment of pressure management systems

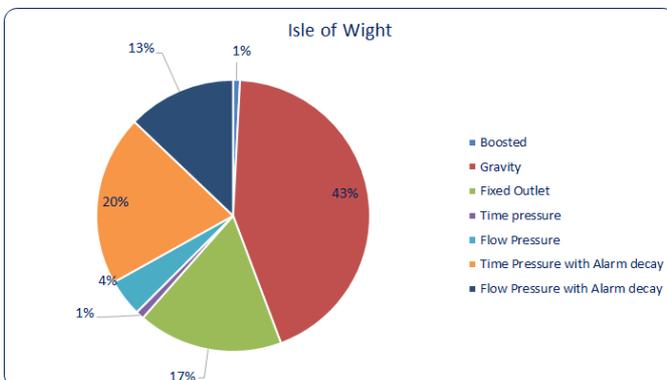
(a) Southampton West supply area



(b) Southampton East supply area



(c) Isle of Wight supply area



The greatest recent improvements have been made in Southampton East, where the proportion of gravity system of 52% is a reduction from 57% at week 13 2021. Over the same period the Isle of Wight has reduced by 1% but Southampton West has not changed; our priority focus over that period has been on Southampton East where great gains could be made. We aim to make more progress as quickly as possible but most of the improvements are alterations that require excavation of pipework and fittings that require road closure and we need Highways Agency agreements and we must work with the other pressures on highways management, including the roads resurfacing programme, where-in implemented resurfacing will have Section 58 Notice preventing other works for some time. Also, on the Isle of Wight, there is a summer embargo on street works, to be respectful of the importance of summer tourism to the island.

Table 6 below summarises Average Zonal Night Pressures (AZNP) of 2020-21 and 2021-22, together with the associated hour to day factor (HTDF). This shows, using AZNP as a valid indicator, that Southern Water’s pressure management improvements have been successful in reducing operating pressures across all zones, noting that one of the largest reductions has been in Southampton West zone, with good reduction in Southampton East. The reduction on the Isle of Wight, where the topography is more variable in relatively small area, is less. Some further improvement has been implemented in 2022-23 with more planned.

**Table 6 Summary of Average Zonal Night Pressures and changes 2020-21 to 2021-22**

Changes in average zonal night pressures.	2020-21		2021-22		AZNP change 20-21 to 21-22
	AZNP (m)	HTDF	AZNP (m)	HTDF	
Water Supply Area					
Hampshire Andover	44.22	23.13	41.25	23.35	-2.97
Hampshire Kingsclere	51.78	23.62	51.67	23.30	-0.11
Hampshire Rural	51.47	22.81	50.31	22.80	-1.16
Hampshire Southampton East	42.71	22.73	39.44	22.80	-3.27
Hampshire Southampton West	41.19	23.10	34.65	23.43	-6.54
Hampshire Winchester	42.74	23.32	40.58	23.31	-2.16
Isle of Wight	43.74	22.97	42.41	22.88	-1.33
Kent Medway East	43.52	23.02	35.19	23.23	-8.33
Kent Medway West	44.28	22.04	38.36	22.56	-5.92
Kent Thanet	40.52	22.55	38.18	22.43	-2.34
Sussex Brighton	41.65	22.54	37.51	22.89	-4.14
Sussex Hastings	49.20	23.08	46.86	23.19	-2.35
Sussex North	43.60	23.14	37.69	23.47	-5.91
Sussex Worthing	41.65	21.68	37.51	22.37	-4.15
Company	42.84	22.69	38.40	22.93	-4.44

The estimated leakage reduction benefits of the recent pressure management programme and those of the currently planned implementation are shown Table 7 below.

**Table 7 Summary of leakage reduction benefits (Ml/d) of recent pressure management schemes**

Pressure management - current programme benefits	Supply area						Totals	
	Southampton East		Southampton West		Isle of Wight			
Phase	DMAs	Benefit (Ml/d)	DMAs	Benefit (Ml/d)	DMAs	Benefit (Ml/d)	DMAs	Benefit (Ml/d)
Completed phase 1	18	0.764	18	0.725	19	0.090	55	1.579
Completed phase 2	2	0.103					2	0.103
Planned phase 2	18	0.820	5	0.180	10	0.128	33	1.128
Grand Total	38	1.687	23	0.905	29	0.218	90	2.810



## 3.5 Management of outage

Southern Water has carried a higher level of source outage than has been included (allowed for) in its plans over recent years. Our overall position has been reported annually to the EA each year recently and we have been provided monthly updates since 2021. Updates will be provided during the drought permit process.

### 3.5.1 Outage during the drought

Current (end of May 2022) source by source outage levels in Hampshire and the Isle of Wight are shown in Table 8 relative to expected deployable outputs (MDO) assumed within the WRMP supply-demand balance.

The categories of outage included by column in Table 8 are defined in Table 9. Company level performance since March is shown in Figure 6. (We are working on making this form of data presentation available for Western Area and or sub-area before the final drought permit application is submitted).

The main outages in Western Area (Hampshire and Isle of Wight) are at Testwood and Otterbourne, related to Treatment works process issues.

River Test Drought Permit Application

1.4 Evidence the Company has followed its Drought Plan

Table 8 Outage performance for Hampshire and the Isle of Wight in June 2022, using WRMP calculation procedure

WRZ	Source	Total(June)	Ongoing Full	Ongoing Partial	Reactive Asset	Reactive Raw WQ	Planned	Requires Upgrade	Comments
HSW	Testwood	9.33	0.00	0.00	1.67	0.00	6.00	0.00	Filters 5, 6, 7, 8 OOS for maintenance. Stream 3 returned to service
HSE	Otterbourne SW	18.57	0.00	0.00	6.57	0.00	0.00	12.00	SW source cannot achieve MDO
HSE	Otterbourne GW inc. Twyford Moors	4.11	0.00	0.00	0.00	0.89	0.88	2.34	New pump installed at TM. Requires surge vessel RTS to turn up flows
HSE	Twyford	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HW	Easton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HW	Totford	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HW	Barton Stacey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HSR	Horsebridge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HSR	Timsbury	1.95	0.00	0.00	0.00	0.00	0.00	1.95	Site cannot achieve MDO
HA	Andover	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HA	Chilbolton*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HA	Ibthorpe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HA	Overton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HA	Whitchurch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HK	East Woodhay	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
HK	Kingsclere	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Bowcombe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Calbourne	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Carisbrooke	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Chillerton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Knighton Chalk	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Knighton LGS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Ventnor New	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
IOW	Sandown	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Figure 6 Outage performance since April for the whole company

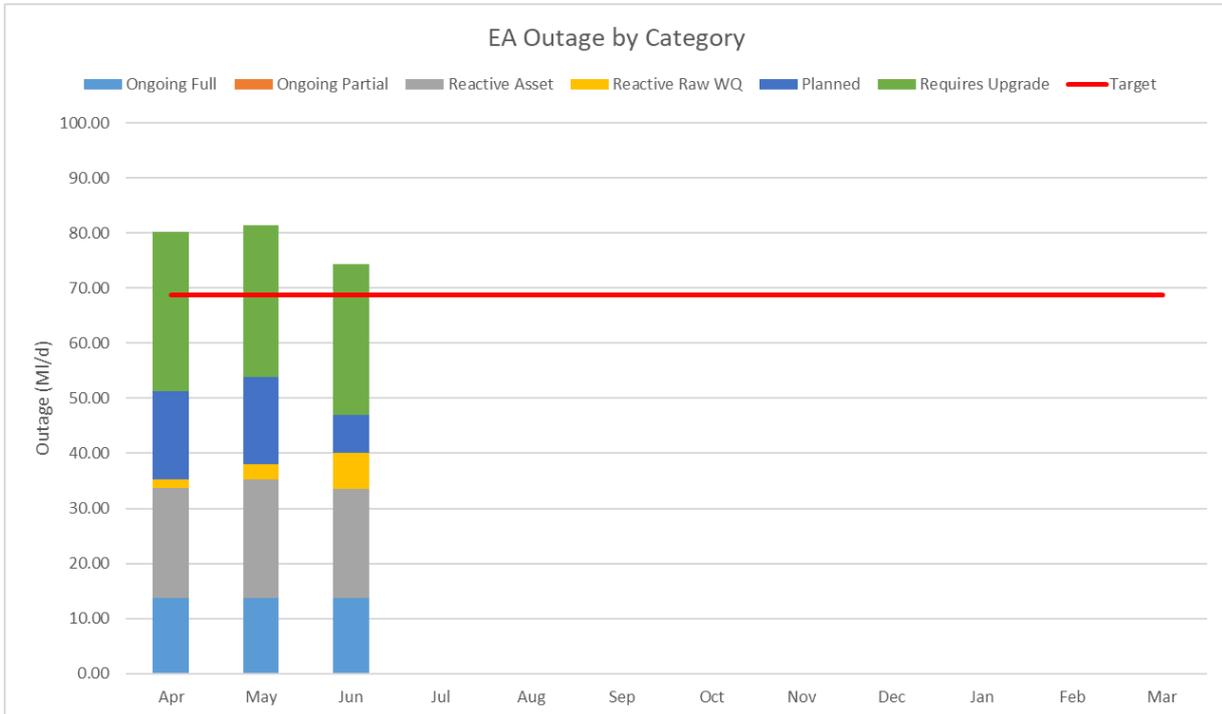


Table 9 Outage definitions by category

Outage Type	Definition
Ongoing Full	Full outage of site requiring capital scheme
Ongoing Partial	Partial outage of site requiring capital scheme
Reactive Asset	Full or partial outage of site due to asset failure requiring Operational response
Reactive Raw WQ	Full or partial outage of site due to raw water challenge e.g. turbidity
Planned	Full or partial outage resulting from asset(s) being taken out of service for planned maintenance
Requires Upgrade	Site is unable to achieve target deployable output although no failed asset(s)

### 3.5.2 Effects of outage on supplies and the supply-demand balance

An outage allowance is included in the water planning supply-demand balance and, if actual outage is kept within that allowance, the supply-demand balance is not negatively affected but, if outage exceeds the planning allowance, there is a direct impact on the supply demand balance.

However, this drought permit application is made on the basis that transfer out of Southampton West zone will be minimised as possible. That being so, the only remaining ‘outage’ influence on the permit is the Testwood river abstraction and its treatment; there are no other sources in the Southampton West supply area. Clearly it is vital that Southern Water can keep the Testwood Treatment Works and the abstraction from the river it depends on in service and performing sufficiently well to maintains supplies to customer demand in the zone and, essential support to

neighbouring zones – especially the Isle of Wight which is dependent. The Testwood Supply Works is carrying outage at present, and that outage may not be removed until the end of 2022 (capital maintenance programme). However, the outage is ‘partial’, with enough output achievable to satisfy the normal range of demand.

Recently (June and July 2022) there have been some raw water quality issues at the Bowcombe groundwater source on the Isle of Wight and a period of ‘run to waste’ was necessary. This increased demands on other source, especially Carrisbrooke but, also requirement to transfer from the mainland. We are also conscious that we had to operate very close to the new monthly limits of the new abstraction licences at Bowcombe and Carisbrooke in July 2022. (New licences were issued by EA in October 2020).

### 3.5.3 Actions undertaken to pre-empt outage

The company has deployed a “Water First” initiative, to develop and implement a new fit for the future approach to operational maintenance and investment planning. This included conducting systematic surveys of operational hazards and risks, to drive prioritisation in risk and resilience investment. This programme has already driven down outage compared to statistics of several years ago.

Recent proactive outage pre-emptive actions include:-

- New pump at Twyford Moors borehole;
- Run to waste receiving borehole established at Twyford (for flow from borehole 1);
- Easton borehole 2 control unit replaced facilitating return to service;
- Isle of Wight augmentation borehole condition review and abstraction pump tests;
- Knighton, Chillerton and Calboure boreholes resurveyed;
- Planning borehole 2 pump and rising main replacement at Barton Stacey.

### 3.5.4 Plans for further outage recovery

The company has an ongoing source outage recovery plan across all its areas. The current (July 2022) plan for Western Area is shown in Table 10 below, showing output benefits in terms of deployable output (MDO, PDO) relevant to the WRMP supply-demand balance or, output capacity relative to expected peak production capacity (PWPC). Expected return to service (RTS) dates are also shown.

**Table 10 Outage recovery plan for Western Area (July 2022)**

Western Area outage recovery plan (July 2022)		Output benefit				
Site	Outage type	MDO	PDO	PWPC	RTS	Comments
		MI/d	MI/d	MI/d	Date	
Testwood	Partial	9.33	9.33	6.83	Jan. 2023	RGFs 5,6,7 & 8 OOS for cleaning
Otterbourne SW	Partial	18.57	18.57	6.6	Mar.2023	RGFs 2 & 4 OOS for refurbishment
Otterbourne GW	Partial	4.11	7.51	0	July	Awaiting leak repair and sampling on surge vessel.

Easton	Partial	0	0.1	1.14	September	PWPC test to be scheduled
Andover	Partial	0	0.7	0	AMP 8	Hydraulic constraint related to UV plant
Whitchurch	Partial	0	0	0.21	August	PWPC test to be scheduled
Chillerton	Partial	0	0	0.1	August	PWPC test to be scheduled
Ventnor	Full	0	0	2.39	September	Water quality challenges

Significant progress was made in reducing partial outages at Hampshire groundwater sites in 2018 and 2019 and outages have been kept low since. A return to service of one of the Twyford boreholes was completed in recent weeks, providing a good reliability benefit to management of output from that source.

Another notable partial outage (1.95 Ml/d) at Timsbury is the subject of an ongoing scheme to reinstate borehole 1 to service to overcome turbidity issues that affect the existing in-service assets. This scheme is close to completion.

This plan includes critical strategy capital maintenance schemes on the Test and Itchen Surface Water Works in Hampshire. These maintenance schemes are expected to achieve their main outage recovery in 2023 but some may be recovered earlier. At both sites works have already completed improvements but with significant works still to be done. Progress to date and coming works are listed below. The investment programmes demonstrate the commitment to address partial outages and improve the reliability of outputs from these sources within their licences. The coming works will be kept under review in case of conflict with best drought management and associated risks.

Capital investment programme - progress to date and improvements planned – Testwood

**The improvement implemented to date and when.**

- Decommission the old contact tank and build a new backwash tank. **Completed by 31 March 2022**
- Refurbishment of RGF’s 1-12. **8 completed by 31 March 2022**, remaining 4 under refurbishment.
- Installation of temporary UV treatment. **Completed by 31 January 2020.**
- Replacement of chemical dosing systems including ferric chloride, polyelectrolyte and hypochlorite. **In service since 31 December 2021.**
- Upgrade of existing PAC dosing system.

**The current / immediate next few weeks activities.**

- Refurbishment of remaining 4 RGF’s and return to service **planned in September 2022.**
- Implement temporary solution to deal with site discharges to river and remove tankering from site. Subject to EA approval.
- Commissioning and hand over of chemical dosing packages.

**The programme for the next six months and,**

- Completion of RGF refurbishment.
- Commissioning and hand over of chemical dosing packages.
- Installation of abstraction flow meters

**More broadly to completion.**

- RGF refurbishment take over **October 2022**
- Commissioning new abstraction flow meters as ‘primary’ **March/April 2023**
- Return to the head of works package take over **currently May 2024**
- Phase 2 scope currently in design of programme development.



Capital investment programme - progress to date and improvements planned – Otterbourne

**The improvement implemented to date and when.**

**Phase 1**

- Works complete to improve asset condition, resilience and control of the RGF's. Improvements **completed by 31 Aug 2019.**
- Review and update equipment and procedures relating to all dosing pumps at Otterbourne ground and surface works (except PAC dosing). Improvements **completed by 31 Jan 2020.**
- Replacement of Ferric dosing system. **Completed by 31 Jan 2020.**
- Installation of auto shutdown on low lift pumping station. **Completed by 31 Jan 2020.**

**Phase 2 - Scope of work currently under construction**

- Install and commission new hypo dosing system, controls and monitoring
- Provision of duty / standby polyelectrolyte dosing system
- Design and build new combined surface and groundwater contact tank
- Construct ultraviolet treatment for full combined works flow
- Installation of new intermediate and high lift pumping stations
- New final run to waste
- Refurbishment of low lift pumping station
- Borehole and well improvements
- HV and power supply upgrades
- Replace site monitoring and control systems, upgrade SCADA and WQSD

**The current / immediate next few weeks activities.**

- Surge Vessel Base and delivery
- Service water booster pump pipework
- MF feed pipe support slab
- Connection of draw pits
- Borehole C MCC kiosk flooring
- Transformer flooring and delivery
- Wells upgrade
- Service water kiosk base
- Mixer Slab Pipework
- Scaffolding to allow cable pulling from MCC to HLPS
- Contact Tanks pressure testing
- UV kiosk installation
- UV reactor installation
- IBT baffle curtains
- Above the ground UV pipework
- Borehole A and C headwork kiosk delivery
- Borehole A and C MCC delivery
- Installation of shutters for walls concrete pouring in Switch Gear
- Orth dosing area ducting and dosing lines
- Removal of redundant poly system and new poly dosing to clarifiers and SED tanks
- Reducing Ground Level and continuation of RGF installation
- Crossing WSR lines - New Otterbourne & Twyford WSR pipe runs
- Crossing WSR lines - New MF feed pipe
- Crossing balancing main - RGF feed line
- River Abstraction cabling
- Staircase and baffle curtains on the TWBT
- IPS sample kiosk base

### 3.5.5 Resource benefits of outage recovery

Any reduction of outage is obviously a good thing, reducing supply risk and the source output benefits expected from the recovery programme are indicated in Table 10 above.

The return to service of Ventnor indicated above is of additional benefit, representing availability of output over and above the zero deployable output assumed for Ventnor in the WRMP supply-demand balance. However further concerns about water quality at the site have delayed any return to service until September.

However, outage is not causing the need for this drought permit application.

## 3.6 Household metering and per capita consumption

Southern Water implemented a 'Universal Metering Programme' between 2010 and 2015. This programme installed nearly 450,000 meters in customer properties across Kent, Sussex and Hampshire. The company's household metering level reached 87% in 2017; the highest level in the industry (Consumer Council for Water, 2017). The company metering level is currently at 88% overall, and at 91% in Western Area.

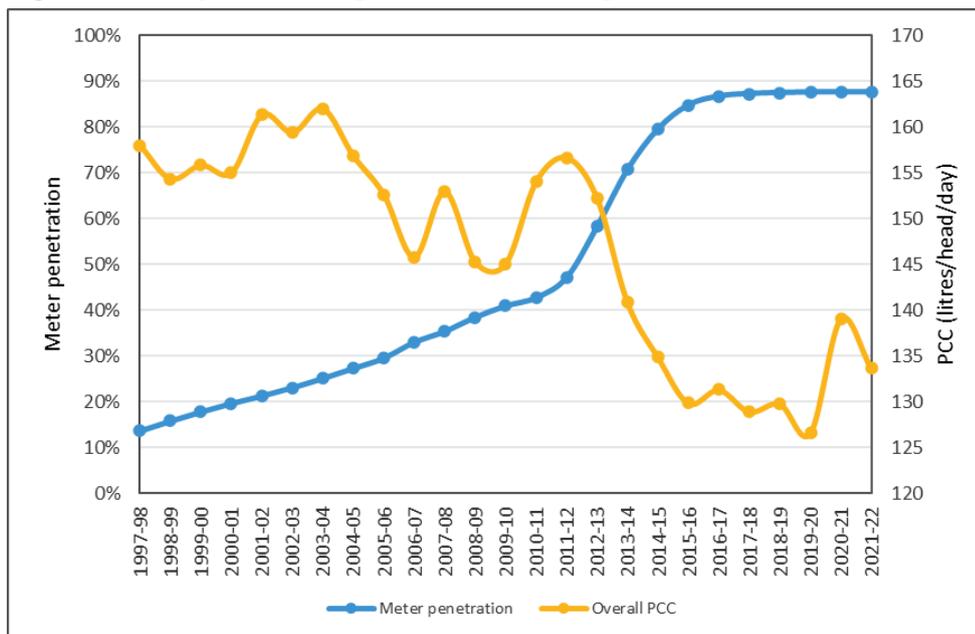
A four-year study by the University of Southampton (Ornaghi and Tonin, 2015) examined the impact of the metering programme on water consumption and concluded that it achieved an overall reduction in consumption of around 16.5%. Figure 7 shows the increase in meter penetration and reduction in per capita consumption (PCC) since 2001 for Southern Water.

Since 2020 there has been a large increase in PCC due to Covid. It is thought that the primary driver for this increase is a wide scale shift to home working. The PCC dropped in the 2021-22 reporting year, possibly relating to partial return to office working.

We continuously track the demand and estimate PCC levels to ensure we understand trend and how we should target our water efficiency promotions.

As our metered customer data set builds up we will have an increasingly useful pool of data for assessing trends and targeting water efficiency promotion. We have also recognised the need to install smarter meters and /or get meters read more frequently. At present detailed targeting is constrained by the frequency of data. We are testing 'Jellyfish' a clip on meter reading device which is proposed to give us more granular details on consumption. At present 1,500 of these are on a trial; a good majority are in Hampshire.

Figure 7 Per capita consumption versus meter penetration



### 3.7 Other actions

#### 3.7.1 Management of transfers and bulk supplies

The main opportunity to reduce abstraction at Test Surface Water relates to reducing transfers from the Southampton West supply zone to neighbouring zones. There are no alternative sources in the Southampton West supply area; the River Test abstraction is the only source.

In recognition of the Test Surface Water Drought Permit requirement, we intend to minimise transfer from Southampton West to Southampton East, aiming to reduce this to effectively zero whenever possible (except for need to maintain a small sweetening flow). We aim to escalate this approach especially when the river flow recession progresses below the 35-day trigger level and toward the hands-off flow.

This causes increased abstraction at our abstractions points on the River Itchen to make up the supply in Southampton East zone. Making no transfer to Hampshire Rural zone also increases the pressure on the groundwater abstraction in that zone. If an outage event or exceptional demand occurs in these other zones, a transfer may have to be re-instated from Hampshire Southampton West. However, Hampshire Southampton East can be supported by the Portsmouth Water Bulk Supply and we will liaise with Portsmouth to optimise this relative to the drought permit management.

If the River Itchen flow falls to levels where it becomes a concern in itself, we would use supply we can take from Portsmouth Water to help reduce abstraction pressures as there is general consensus that taking water at the Itchen tidal limit (Supply from Portsmouth Water to Southern Water) is environmentally preferable to abstraction at more upstream sources when flows are low.

However, if the River Itchen flows continue to fall, there will be increased risk of need to apply for the Candover or Lower Itchen drought orders. Under this circumstance, the Section 20 Agreement

expects further consideration of the environmental balance of abstraction between the River Test and River Itchen.

The other main transfer from the Southampton West, facilitated by abstraction at Test Surface Water, is the transfer to the Isle of Wight. We have reviewed all supply production opportunities on the Isle of Wight and conclude that we are unlikely to be able to reduce the transfer to less than 12 MI/d and there are some current source output risks and relatively recent new abstraction licence constraints on the Isle of Wight that may mean the transfer cannot be reduced that low or, if it is, not for long periods. We will keep this under review as the permit progresses but, we do not envisage large reduction of this allowance will be possible in the short term.

Management of transfers may fluctuate as, despite deploying all due effort to manage demand and outages to enable transfers to be minimised, events may occur that impose exceptional short-term pressures. For example, the exceptional hot dry weather and consequent demand pressures experienced between 7th July and 21st July 2022 caused need to increase abstraction from the River Test to support local demand but also to support increased transfer to the Isle of Wight to cover demand increases there.

We are providing weekly data updates to the EA on abstraction, demand and transfers.

### 3.7.2 Other actions undertaken to manage resources or reduce demand

Demand management and / or leakage reduction in the Southampton West supply area itself (or in neighbouring areas relative to normal transfer support from Southampton West) provide the only other means of reducing the abstraction requirement while still satisfying customer requirements. Our approach to these measures is covered above (sections 3.3, 3.9 and 3.4).

### 3.7.3 Other actions considered and rejected to manage resources or reduce demand

We have considered whether alternative abstraction in other supply areas might provide any means to supplement the Southampton West supply area, and so, help reduce abstraction at Test Surface Water. Southern Water has no immediate infrastructure capability to bring water into the Southampton West supply area from neighbouring zones. The development of a 'regional grid' is proposed within the WfLH programme but, still some years from beneficial availability.

If this was essential, water would have to be tankered in, which has logistical difficulties, social and environmental impacts and limited volumes.

Southern Water is also conscious that many of its sources are listed in the EA's Water Industry National Environment Programme (WINEP) for further investigation of abstraction impacts, with many already under these investigations.

### 3.7.4 Benefits of the permit

The permit will enable Southern Water to maintain supplies to customers. This position is explained in more detail in the Statement of Reasons (document ref: 1.2 Reasons for the permit).

## 3.8 Consequences if the permit is rejected

Without the permit unplanned and severe water restrictions are at risk of being imposed on customers. This position is explained in more detail in the Statement of Reasons (document ref: **1.2 Reasons for the permit**).

## 3.9 Implementation of TUBs

The S 20 agreement includes recognition that Temporary Use Bans (TUBs) can only be implemented just ahead of implementation of the River Test drought permit. This is different to the EA national guidance which normally expects TUBs to be implemented by the time of application for a drought permit or drought order. The special provision was included in the S 20 in recognition of the high frequency to which the early (pre-application and application) stages of the River Test drought permit procedure are likely to be triggered, seeking to avoid too-frequent requirement to implement TUBs.

This recognition reassured Southern Water that it would not have to implement TUBs unduly often in relation to the River Test drought permit and should be able to adhere to its planned level of service to customers as committed in its WRMP 19 and Drought Plan 19. That service commitment is as summarised below (or see section WRMP 2019 Annex 1 section 6):-

- |                                       |                         |
|---------------------------------------|-------------------------|
| ■ Advertising to influence water use  | - once in five years;   |
| ■ TUB                                 | - once in ten years;    |
| ■ Non-essential use drought order     | - once in twenty years; |
| ■ Abstraction drought permit or order | - once in twenty years. |

The commitment to implement TUBs as above includes note (see WRMP 2019 Annex 1 section 6) that the above target frequency is for a first implementation which may be part of a phased implementation. Another note in the WRMP 2019 Annex 1 section 6 recognises that in Southampton West and Southampton East the implementation of abstraction related drought permits and drought orders could be more frequent than the target in the short term (i.e. the “interim” period of the S 20 agreement).

### 3.9.1 Discussion of decision making about implementation of Temporary Use Bans (TUBS)

Southern Water should implement temporary use bans (TUBs) in line with its target level of service to customers. However, the company recognises that precisely identifying in real time that a drought has developed to the severity of once in ten-year occurrence is problematic.

We have been and will continue to monitor the evolving weather, hydrological and water supply-demand situation through the drought permit preparation and application process. We will ensure the timing of implementing TUBs is accounted for within our forecasts of the need for operational implementation of the permit and ensuring that we account for the required 7-day advertising period required prior to implementing a TUB.

We have refreshed our internal understanding of the geographical deployment options for TUBs relative to this drought permit applications, including which supply boundaries should be considered and, how these map onto Local Authority boundaries that will most likely be the best publicly understandable expression of implementation. (We seek to avoid the oddities of ‘one side of the street being under a restriction and the other not’).

We have also liaised with neighbouring water companies about their situation and plans and, the implications of our implementation of TUBs for them. In making an actual implementation decision we will reflect on short, medium and longer-term perspectives as to the most appropriate approach, not least because the timing of implementation is also an influence on their effectiveness.

The following factors are all considered in our decision taking:-

- Our levels of service commitments to customers;
- Maintenance of supply to customers (no. of customers affected by the restriction);
- The relationship between the drought permit abstraction and the supply areas' water demands;
- What environmental (abstraction) impacts are we trying to alleviate;
- What demand savings (abstraction reductions) can be achieved;
- The forecast weather, supply and environmental risk situation;
- Is any phasing pertinent;
- The logistics of implementation (advertising scheduling etc.);
- Clarity for customers;
- Regulatory expectations;
- Reputational implications.

Table 11 below summarises the primary current customer parameters of the water supply (planning) zones of Hampshire and the Isle of Wight as pertinent to decision about implementing TUBS. The estimation of potential demand savings that are included in Table 11 are discussed in section 3.4.2.

**Table 11 Potential demand savings from implementing Temporary Use Ban**

<b>Potential demand savings (and so abstraction reductions) from implementing Temporary Use Bans (TUB).</b>									
Water Resource Zone	No. properties	Population	WRMP forecast peak pcc	Recent pcc - June 2022	Recent household demand (based June pcc)	TUB saving @1% of recent	TUB saving @5% of recent	TUB saving @10% of recent	TUB saving @10% of peak
(WRZ)	(1000's)	(1000's)	(l/hd/day)	(l/hd/day)	(Ml/d)	(Ml/d)	(Ml/d)	(Ml/d)	(Ml/d)
HK	7.19	17.27	208	150.4	2.60	0.026	0.130	0.260	0.359
HA	34	75.05	159.2	132.1	9.91	0.099	0.496	0.991	1.195
HR	12.95	28.29	158	142.2	4.02	0.040	0.201	0.402	0.447
HW	33.65	80.46	158	128.3	10.32	0.103	0.516	1.032	1.271
HSE	177.69	422.24	152	128.6	54.30	0.543	2.715	5.430	6.418
HSW	70.93	167.75	149	126.7	21.25	0.213	1.063	2.125	2.499
IoW	74.65	144.16	177	131	18.88	0.189	0.944	1.888	2.552
<b>Totals</b>									
HSW + HSE	248.62	589.99	n/a	n/a	75.55	0.756	3.778	7.555	8.918
HSW + HSE + IoW	323.27	734.15	n/a	n/a	94.44	0.944	4.722	9.444	11.469
HA + HW + HR + HK	87.79	201.07	n/a	n/a	26.86	0.269	1.343	2.686	3.272
6 zones (ex. HK)	403.87	917.95	n/a	n/a	118.70	1.187	5.935	11.870	14.382
7 zones	411.06	935.22	n/a	n/a	121.30	1.213	6.065	12.130	14.741

**Key to zones** - HK = Hants Kingsclere; HA = Hants Andover; HR = Hants Rural; HW = Hants Winchester; HSE = Hants Southampton East (Itchen); HSW = Southampton West (Testwood); IoW = Isle of Wight.

### 3.9.2 Evidence of effectiveness of TUBs

Southern Water has assessed the potential benefits of TUBs and demand saving figures are included in the company Drought Plan. The original assessment by Consultants Atkins in 2015-16 was updated, again by Atkins, in 2019-20. Their update was shared with the EA in draft and the final report also provided as: SWS Demand Analysis Update – Effectiveness of Restrictions – Technical Report Update, Atkins, October 2020. This document is included in the application as document ref: **1.4 App 2 Effectiveness of Restrictions**.

In summary the assessments concludes that demands in Western Area (Hampshire and Isle Wight) may be reduced by TUBs, by 1% during October to April; 2% in May and June; 5% in July and August; and, 3% in September.

In Table 11 above we show estimates of potential household demand saving from TUBs based on percentage savings of 1%, 5% and 10%. We have applied these percentage savings to the estimated recent zonal household demand of June 2022. We include a calculation of 10% saving relative to possible peak period demand, using peak period pcc from the WRMP 2019 dry year peak period forecast for year 2022-23. The savings are clearly more substantial relative to the potential peak and assumption of 10 % saving but, we are unsure whether 10 % saving is possible relative to our already highly metered customer base. we expect such peak period demand to be short lived and so the savings likewise temporary. Relative to the drought permit and its relationship to the river flow recession and the associated environmental risks, the 5% savings suggested possible in July and August are most relevant to the consideration of implementing TUBs. We note that in combination the Hampshire Southampton West Southampton East and Isle of Wight saving in household demand from a TUB across these areas could be 4.7 MI/d relative to recent (June 2022) total household demand demand of 94.44 ml/d, the majority of which is from the Southampton East area.

We note this recent three-area total household demand is approximately 2 MI/d higher than the dry year annual average forecast for 2022-23 in WRMP 2019. A heightened household demand is thought to relate to the shift to ‘working from home’.

Should TUBs be implemented, the company will endeavour to determine their actual impact on the prevailing demand, although it must be recognised that this is very difficult as there are many variables at play.

### 3.9.3 Implementation of TUBs

Our conclusion, taking into account the range of considerations discussed above, is that we will most likely implement TUBs across the Local Authority Areas equivalent to our Hampshire Southampton West and Southampton East supply area and our Isle of Wight supply area as a phase 1 implementation, with the remaining supply areas of Hampshire introduced as a phase 2, for additional impact, should drought risk escalate. The three zones proposed included in the phase 1 TUB are the most directly related to the abstraction from the River Test and so, the drought permit and the management of abstraction within it.

The potential demand reduction of 4.7 MI/d, as derived in Table 4, is the most pertinent to the permit considerations, though short-term peak demand reduction of 9.4 MI/d to 11.5 MI/d occur within the average.

Some 323,000 household properties or 734,000 people will be restricted by the proposed Phase 1 TUB.

Demand in potential phase 2 zones is much less directly linked to the abstraction on the River Test of the drought permit. The phase 2 TUB will add 88,000 properties and 200,000 people to those restricted.

It should also be recognised that the potential demand savings are expected to fall away in September and even more so in October and onward.

At present our forecast is that will advertise the phase 1 TUBs from 12th August so that they will be in force from 19<sup>th</sup> August but, this and the phasing, will be kept under review relative to the evolving situation until the point of executive decision. (Also, see section 3.1).

### 3.10 Summary of actions in line with drought plan

This drought permit application is consistent with our current Drought Plan, with our new Drought Plan (2022) and, in line the Section 20 Agreement. We have:-

- Monitored the water resources situation, including the River flow levels and made forecasts of how these may develop, discussing these with the EA.
- Set out a schedule through to application submission, the EAs period of determination of the application and potential implementation.
- Engaged stakeholders in the pre-application period and advised them of the process and their opportunity to participate.
- Undertaken enhanced promotion of water efficiency.
- Deployed enhanced resource to reduce network leakage.
- Adjusted our operations to minimise the required abstraction at Test Surface Water as much as possible.
- Progressed the substantial S 20 agreement package of monitoring, mitigation and compensation to be implemented for the River Test, with a number of improvements implemented on the River Test in 2019 to 2021, with more planned in 2022.

## References

Consumer Council for Water, 2017, Water, water everywhere? Delivering a resilient water system (2016-17)

Environment Agency, 2021, Water resources planning guideline

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

Hydromaster rainfall portal. Available at: <https://app.hydromaster.com/>

Ornaghi, C., and Tonin, M., 2015, The Effect of Metering on Water Consumption – Policy Note. University of Southampton

Southern Water, 2019, Final Drought Plan 2019, Southern Water Services Ltd. Available at: <https://www.southernwater.co.uk/our-story/water-resources-planning/our-drought-plan>

Southern Water, 2019, Water Resources Management Plan 2019, Southern Water Services Ltd. Available at: <https://www.southernwater.co.uk/our-story/water-resources-planning/water-resources-management-plan-2020-70>

Southern Water, 2022, Revised draft Drought Plan 2022, Southern Water Services Ltd. (unpublished at time of application),

Water Resources in the South East, Regional Plan. Available at: <https://wrse.uk.engagementhq.com/our-regional-plan>