

WATER RESOURCES MANAGEMENT PLAN ANNUAL REVIEW 2024

RESPONSE TO JOINT REGULATORS FEEDBACK



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The Water Act 2003 places a duty on all water companies to prepare an updated Water Resources Management Plan (WRMP) every five years. As part of the WRMP process, it is a statutory requirement to review progress against the Plan and report it to the Secretary of State (SoS) within an Annual Review.

At the time of our last annual review, 'Annual Review 2024' (AR24), our current and published WRMP was our 'Revised WRMP19' (rWRMP19)¹. The AR24 set out our performance for 2023-24 in comparison with our forecast positions for the same year in our rWRMP19. It identified that in the event of an extreme 1-in-200 year drought occurring, there would be a deficit in our supply demand balance of 21.2 Mega litres per day (MI/d). This would limit our ability to provide bulk supplies to Southern Water.

On the 11th October 2024 the Department for Environment Food & Rural Affairs (Defra) wrote to us jointly from Defra, the Environment Agency and Ofwat, highlighting concerns with our security of supply, and risk to the environment. The five key topics were:

- Supply Demand Balance (SDB)
- Leakage
- PCC
- Metering
- Supply-Side Scheme Delivery

This response document provides the information requested by Defra in that letter, and because it forms part of our AR24 we have published it on our website. We have provided further information to explain the challenges we are facing, which include higher demand for water since the Covid pandemic, and low meter penetration due to a historic Environment Agency designation.

With respect to those SDB components we do have some control over, the key drivers for the deficit are:

- Deployable Output reductions, outages and raw water losses greater than forecast (by 11.85 MI/d).
- Leakage being more than forecast by (3.93 MI/d).
- The approach to the reporting of bulk supplies in the SDB.

In this document we provide action plans to improve our SDB and alignment with our recently published Final Water Resources Management Plan 2024 (Final WRMP24). Actions include:

- Continuing with our existing suite of successful activities and overall approach to leakage reduction, that resulted in a 4 MI/d drop in leakage.
- · Bringing sources back into supply following maintenance and improvement works.
- Reviewing how bulk supplies should be represented within the next Annual Review, AR25.
- Working with the top 1 % of non-household water users to collectively reduce their consumption.
- Installation of 500 meters as part of a smart meter trial, completion of 1,000 home audits, and transition of 20,000 customers to metered charges.

¹ Since the submission of our AR24, we have published our Final WRMP24. Therefore our next Annual Review, AR25, will review progress against our Final WRMP24 which can be found here: https://www.portsmouthwater.co.uk/news/publications/water-resources-planning/

We will monitor our progress against these plans with our joint regulators on a 6 monthly basis and via Quarterly Directors Meetings

1.1. Background

The Water Act 2003 places a duty on all water companies to prepare an updated Water Resources Management Plan (WRMP) every five years. As part of the WRMP process, it is a statutory requirement to review progress against the Plan and report it to the Secretary of State (SoS) within an Annual Review.

Our Final WRMP 2019 (fWRMP19) was published in November 2019. This was revised and republished in December 2022 to reflect both our current company position, and advances in industrywide approaches to improve data forecasts. At the time of our last annual review, 'Annual Review 2024' (AR24), our current and published WRMP was our 'Revised WRMP19' (rWRMP19)².

In June 2024 we published our AR24 on our website at the same time as submitting it to our joint regulators. The document set out our performance for 2023-24 in comparison with our forecast positions for the same year in our rWRMP19. We also provided comparisons in the context of our WRMP24, which was at the time, in its Revised Draft version (rdWRMP24). Since then, our joint regulators have reviewed and provided feedback on our AR24.

The Environment Agency provided their feedback letter on 9th September 2024. This requested further information on how and when we plan to address Environment Agency recommended improvements associated with our levels of outage and non-household demand. We provided this information within our response letter of 1st November 2024.

On the 11th October 2024 the Department for Environment Food & Rural Affairs (Defra) wrote to us jointly from Defra, the Environment Agency and Ofwat. This letter identified that the Environment Agency and Ofwat have assessed our AR24 and have highlighted concerns with our security of supply, and risk to the environment.

The actions Defra require us to undertake to address these concerns were set out in an Annex to their letter. Additionally, they require evidence in writing that demonstrates we have taken the actions specified.

1.2. This document

This document provides the information requested by Defra in that letter, and because it forms part of our AR24 we have published it on our website. We have structured this document to align with the headings in the Annex table of the Defra letter:

- Section 2: Supply Demand Balance (SDB)
- Section 3: Leakage
- Section 4: PCC
- Section 5: Metering
- Section 6: Supply-Side Scheme Delivery

Within each section of this document, we state the issue raised by the joint regulators and then provide our response.

² Since the submission of our AR24, we have published our Final WRMP24. Therefore our next Annual Review, AR25, will review progress against our Final WRMP24 which can be found here: https://www.portsmouthwater.co.uk/news/publications/water-resources-planning/

2. SUPPLY DEMAND BALANCE (SDB)

2.1 Issues and actions raised in the regulators letter

The Joint Regulators have expressed concern that our reported deficit of 21.2 mega litres per day (MI/d) is a resilience risk to the security of supply for both our customers and those of Southern Water (via our bulk supplies). Our Revised WRMP19 (rWRMP19) forecast deficit for the 2023-24 reporting year is 4.8 MI/d and our rdWRMP241³ forecast deficit is 1.33 MI/d. They are therefore concerned that our current performance makes achieving the planned WRMP24 starting point, and subsequent glidepath more difficult. It is a variance between our outturn and our forecasts for leakage, outage, and raw water/treatment work losses and operational use that is contributing to this deficit.

The Joint Regulators have asked us to provide:

- An explanation of the exact causes of our SDB deficit as required per Annual Review guidance.
- An update of the work being undertaken with SWS to explore risks to the bulk supplies, and the assumptions of availability of the bulk supplies for WRMP24.
- A detailed action plan as to how we intend to address and reverse the ongoing trend of an overall
 deficit and bring SDB in line with our WRMP19 (and WRMP24) forecast. This plan should include
 specific actions and timelines and anticipated benefits of those actions.
- Details regarding how we plan to address the underlying causes of our SDB deficit, including actions on leakage, metering, PCC, raw water/treatment works losses and operational use.
- Update on progress with delivery of the actions plans and our performance against rWRMP19 forecasts for SDB and draft WRMP24 forecast starting position for SDB to the Joint Regulators during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

2.2 Response to the supply demand balance issue

In the sections below we describe our reported water resource position for 2023-24 and provide an overall summary of our outturn performance, to highlight the exact causes of our SDB deficit (Sections 2.2.1 and 2.2.2). We then provide further information on specific components of the SDB, including bulk supplies (Section 2.2.3.4), before identifying specific actions and timelines towards improving our SDB (Section 2.3).

We are committed to updating our Joint Regulators on progress against these actions and our performance against the published rWRMP19 and rdWRMP24 during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

2.2.1 Water resource position

We abstract most of our water from groundwater sources and therefore, groundwater levels are the best indicator of the water available from the chalk aquifer. Due to the high levels of rainfall experienced throughout 2023-24, our groundwater levels at our indicator borehole were significantly above Long Term Average (LTA) and we classify 2023-24 as a **wet year.** This contrasts with the

³Note: All references to WRMP24 in this document are referring to the Revised Draft WRMP24 which was the latest version at the time of writing the Annual Review 2024.

forecasts within our WRMP, which are focused on a **dry year**. This is important context when we make comparisons between outturn and WRMP forecasts in the section below.

The Environment Agency has been exploring a revised approach to annual reporting where outturn data are 'uplifted' to better reflect a dry year condition. However, for the AR24 (and therefore this response document), the core review was focussed on the traditional comparison of outturn and WRMP forecast data.

2.2.2 Our supply demand balance in 2023-24

Our Annual Review is an opportunity to review our outturn values against our rWRMP19 forecasts to demonstrate whether our performance is on track to maintain supplies in the event of an extreme drought. Our WRMP forecasts are developed to represent what we would need to achieve in a **dry year** to ensure that we can maintain supplies not only to our customers but, to our neighbours Southern Water (SWS) and the New Appointment and Variations⁴ (NAVs), whilst protecting the environment under dry year pressures.

The methodology we follow for our Annual Review reporting follows the Environment Agency's Guidance⁵ which stipulates that we compare our outturn⁶ values (i.e. those in the 2023-24 **wet year**), with the WRMP **dry year** forecast values. The only exception to this is the reporting of our bulk supplies to Southern Water, where the Environment Agency has required us to use the full transfer volume that is reflected by our WRMP of 30 MI/d when calculating our SDB.

Figure 1 shows how each of our outturn values have contributed to our AR24 reported SDB of -21.2 MI/d.

⁴ Limited companies which provide a water and/or sewerage service to our customers in an area which was previously provided by Portsmouth Water <u>New Appointments and Variations (NAVs) - Ofwat</u>

⁵ Water resources management plan annual review and annual data return. Guidance for England and Wales. Developed by Environment Agency and Natural Resources Wales, March 2024

⁶ Outturn values represent our actual values for a reporting year, and they can be compared with forecast WRMP values to gain insights into our performance.



Figure 1: Outturn performance and Supply Demand Balance in 2023-24

The rWRMP19 Deployable Output (DO) column to the far left of the graph shows how much water we assume to be available in the event of a drought. We then deduct all outturn values of the **supply-side components** of the water balance to obtain our Total Water Available For Use (WAFU).

The outturn values of the demand-side components are then deducted from the WAFU to obtain our final SDB of -21.21 MI/d. This compares with a rWRMP19 forecast SDB of -4.81 MI/d, which is a difference of 16.4 MI/d.

Although we believe that the outturn values are not easily compared to the WRMP forecasts because of the difference between the wet/dry years which they represent, we acknowledge the underlying concerns expressed by the Regulators of the perceived risk prompting these comments. The key drivers for the SDB deficit are:

- DO reductions, outage and raw water losses being more than forecast (by 11.85 Ml/d).
- Leakage being more than forecast (by 3.93 Ml/d)
- Approach to the reporting theoretical maximum values rather than outturn volumes of bulk supplies in the SDB.

The sections below provide further detail on the supply and demand-side components. They also describe how we are planning to address the concerns of our Regulators to bring us in closer alignment with our WRMP forecasts as we look forward to AMP8 and the implementation of our, now published, Final WRMP24.

2.2.3 Supply-side components in 2023-24

This section provides further information on the supply-side components of our SDB to highlight the exact causes of the SDB deficit.

As shown in Figure 1, the supply-side components that are deducted from the rWRMP19 Total Deployable Output to obtain our Total WAFU are DO reductions, Losses, Outage and Bulk Supplies. Both the rWRMP19 and the Final WRMP24 forecasts are provided in Figure 2, as the WRMP24 values will be our future focus. The two forecasts are largely consistent except for bulk supplies. This is because the Final WRMP24 forecast includes the demand from New Appointments and Variations.

Figure 2: Supply side components – outturn vs forecast – Annual Average mega litres per day (2023-24).



As shown in Figure 2, we experienced 7.2 MI/d of DO reductions in 2023-24 which contributed negatively to our SDB as it means that we have less available water for use in a drought. Furthermore our outturn values for raw water losses, outage and bulk supplies are all higher than our rWRMP19 forecasts which also contribute negatively to our SDB. This is explored further in the next sections.

2.2.3.1 Deployable output and reductions

2.2.3.1.1 WRMP Deployable Output

The starting point for the calculation of outturn DO in Table 1 of our AR24 was the rWRMP19 'final plan' water resource zone (WRZ) DO for 2023-24, which is 213.49 Ml/d. This incorporates the rWRMP19 'baseline' WRZ DO for 2023-24 of 193.29 Ml/d, plus the benefits from our drought plan interventions, Source S drought permit (3.60 Ml/d) and demand-side drought orders (16.60 Ml/d).

We note that the rWRMP19 tables for 2023-24 do not assume any MI/d benefit from DO improvement schemes at Sources H, O, J and C, as they were not due for implementation until 2024-25. Therefore

the DO reductions are not associated with non-delivery of supply-side schemes. Further information on the delivery of supply-side schemes is provided in Section 6.

2.2.3.1.2 Deployable Output reductions

Our outturn DO is calculated by deducting the DO of any sources that have been offline for more than 6 months, from the rWRMP19 final plan DO. We have previously described the factors behind our DO outturn value in pages 7 and 8 of our Annual Review 2024⁷, reproduced below for completeness. The total reduction in DO for 2023-24 was 7.2 Ml/d, as shown in Figure 2.

"There were five sites that were unavailable throughout the full reporting year, which means that 100% of their DO as stated in the rWRMP19 is removed.

Further detail on those five sites are as follows:

- Site D and G have been through extensive maintenance programmes and new equipment has been installed on site. However, to protect drinking water safety standards we still need to obtain water quality samples to assess the raw water to confirm the correct classification. The sources will be returned to service, but in the meantime, have been taken off the DO as per the guidance.
- Site E has experienced long term outages due to water quality issues since 2017 and has subsequently been removed for the outturn DO for 2023-24.
- Site I has been offline for the full reporting year due to a positive cryptosporidium detection. We are designing and planning the installation of UV treatment before returning the site to service in AMP8.
- Site S has been through an extensive maintenance programme and new equipment has been installed on site. The source will be returned to service, but in the meantime, it has been removed from the outturn DO as per the guidance.

Site O was offline up until the end of July 2023. It was brought back online in August 2023 and we completed our rWRMP19 AMP7 scheme with the installation of Amazon Filters (enhancing DO in September), six months ahead of schedule. Further details on this scheme are provided in section 3.5.1.3. The site was subsequently taken offline in December 2023 for a UV build and commissioning as part of a wider planned project.

Although the site was not offline for 6 consecutive months in the year, the four months at each end of the year were part of longer duration events which were above six months. These events are therefore accounted for as DO reductions rather than outage."

An update on the sources identified above in our AR24 is as follows:

- Source D [DO 0.9MI/d DYAA]: This source is unlikely to be utilised unless a drought develops, because when operated in conjunction with Source C the network is less efficient, requiring more electricity and incurring greater cost. However, if a drought is forecast, we would review our production plans and consider the correct point to bring this source back into supply, a 6 month process.
- **Source G [DO 1.6MI/d DYAA]:** We are periodically running the source to waste to enable the collection of water quality data. This source is on track to be brought back into supply for 2025-26, depending upon the continuation of positive results of the water quality testing.
- **Source E [DO 0.4MI/d DYAA]:** This is now identified as an 'unused licence' in our Final WRMP24 and there is no DO benefit included within the WRMP24 starting position or forecast. Therefore, in our next Annual Review, AR25, there will be no DO reduction for this source.

⁷ Portsmouth Water, June 2024. Annual Review 2024. Water Resources Management Plan.

- Source I [DO 1.5MI/d DYAA]: We continue to investigate options to allow this source to be put back into supply in early AMP8. These options are focussed on reducing water quality risks, including UV treatment.
- **Source S [DO 2.1MI/d DYAA]:** This source is planned to be returned into supply January 2025 following the completion of maintenance works.
- Source O [DO 0.7MI/d DYAA]: This source is planned to be returned into supply during December 2024 as outlined in Section 6.2.1.1

The update above indicates that we will need to apply DO reductions in our next Annual Review (AR25, which will report on 2024-25), and these are likely to be of a greater magnitude to those in the AR24. These decisions were taken in light of the prevailing weather conditions throughout the year and did not increase the risk of supplies for customers. It should be noted that Sources G, S and O are expected to be put back into supply early on in 2025-26, and therefore DO reductions will reduce again during the first year of AMP8 and WRMP24.

2.2.3.2 Losses (treatment/raw water losses and operational use)

As shown in Figure 2, our outturn losses were above the rWRMP19 forecasts by 2.42 MI/d which is contributing negatively towards our SDB. This section provides an update on our System Monitoring Strategy project that was introduced in our AR24 and is designed to enhance data collection from source to tap. It will enable us to monitor our losses more closely and identify and rectify the exact root causes i.e. reduce losses and improve alignment with the WRMP24 forecast.

2.2.3.1.1 System monitoring strategy project update

At the time of writing the AR24, we were in the gap analysis stage of the project (see Figure 3) where we were using operational schematics, local knowledge and available measurement data to establish an initial understanding of connectivity and recommended flow monitoring options at our sites.

Figure 3: System Monitoring Strategy Process



We have now completed the gap analysis and review phases for the majority of our Water Treatment Works (WTWs) sites which has refreshed information on:

- 1. How volume and flow is measured at each site (see Table 1 below).
- 2. How the waste water is disposed of at the site.
- 3. How operational losses are measured across both normal and infrequent operating conditions.
- 4. The confidence to which the water balance into and out of each site can be determined with the current measuring capabilities (i.e. measured, estimated or inferred from other data) (see Table 1 below).
- 5. Potential interventions to obtain a better view of the water balance at each site, as appropriate.

The remaining sites under review represent our most complex sites, and we plan to complete the assessment of these by January 2025.

On site Water Balance Status	Status Description	Sites currently under the status	WRZ DO represented (%)
GREY	Work still in progress	Sites B, O, A	65.6 Ml/d
MEASURED	Volumes for site losses and/or run to waste can be calculated solely using direct flow measurement	Sites D, G	2.3 Ml/d
INFERRED	Volumes for site losses and/or run to waste is calculated using flow inferred from other data	Sites P, L, K, N, E, J	59.3 Ml/d
INFERRED/ UNKNOWN	Volumes for site losses and/or run to waste is estimated, but unavailable during certain operating conditions	Sites M, Q, H	19.9 MI/d
UNKNOWN	Volumes for site losses and/or run to waste cannot currently be calculated or has unmeasured artesian flow	Sites T, I, C, S, F, R	43.6 MI/d

Table 1 Sites, water balances and status

We are now in the process of finalising recommendations for appropriate improvements to enhance our monitoring on the sites, commensurate with the scale of the site. This includes where meters are needed to be installed or where it would be sufficient to estimate flow and volume using pump operation and pump monitoring (i.e. 'inferred') to optimise capital spend efficiency.

Following this assessment, a criticality, maturity and confidence assessment shall provide our investment team with a best value intervention programme to be undertaken in the short to medium-term which will ultimately improve our data collection and accuracy for this component of the water balance. This may then lead to the identification of options that can be implemented to reduce water losses.

2.2.3.2.2 Hydraulic modelling

The gap analysis will also feed into the full update of the hydraulic model of the network that we are undertaking. We have completed 23% of the full update of the hydraulic modelling and will reach 60% complete by January 2025 and 100% of the network completed by January 2026. This study will provide improved insights into the performance and asset health of our sites, whilst providing more assured measurements for accurately quantifying our losses.

2.2.2.3 Benefits of monitoring and hydraulic modelling

At present we have not assigned any MI/d benefit to the system monitoring strategy project and hydraulic modelling. However, these activities will enable us to start identifying options in 2025-26, followed by implementation of selected best value options.

2.2.3.3 Outage

Our reported outturn outage value for 2023-24 was 8.93 Ml/d, which is above the rWRMP19 allowance of 6.70 Ml/d and therefore contributes negatively towards our SDB (see Figure 2). Our AR24 narrative explains that we took the opportunity afforded by the wetter than average conditions of the reporting year to carry out additional planned works on some of our sites, that resulted in raised levels of **planned** outage. This was a conscious, risk-based decision. If a drought had been forecast, we would have reduced the level of planned outage.

Much of the **unplanned** outage experienced was due to causes linked with high groundwater levels. Therefore, our outturn outage was not representative of a dry weather event. Although this was acknowledged by the Environment Agency, they expressed concerns that the reported outturn value still contributed negatively towards the SDB and increased the security of supply risk to customers.

The Environment Agency provided feedback to us separately about this matter in a letter dated 9th September 2024. We addressed their concerns in a response on 1st November 2024, where we provided an estimate of our 2024-25 outturn outage values, and a first look at our ambitious AMP8 Planned Outage programme.

For more information, please see our recent response to the Environment Agency's letter in the appendix of this document. However, in summary:

- We estimate an annual average outage for 2024-25, which is **below** the rWRMP19 and WRMP24 forecast (i.e. we are on-target).
- We will provide an update on the outage experienced to date for the Joint Regulators meeting in January 2025.
- We must continue to undertake maintenance works at our sources during AMP8 to improve their resilience (planned outage). We will discuss with the Environment Agency a pragmatic approach on how we report so the reduced risk associated with cur conscious evidence-led outage plan is recognised for our next Annual Review, AR25.

The above points are reflected within the action plan in Section 2.3.

2.2.3.4 Accounting for bulk supplies

Our AR24 identifies that we currently operate two bulk supplies to Southern Water. One is feeding east into their Sussex North Zone, with a capacity of 15 Ml/d and a 1 Ml/d 'sweetening flow' maintained all year. The volume is contracted on a 'reasonable endeavours basis', with notice periods to ramp up/down supplies.

Our second bulk supply sends water west into Southern Water's Hampshire Zones. It has a rated capacity of 15 Ml/d but if required under certain operating conditions it can deliver 20 Ml/d for short periods. A 'sweetening flow' of 0.4 Ml/d is maintained all year round. The volume is contracted on a reserved volume basis. The contracted reservation notice periods are 6 months to reserve the water for business as usual (BaU) purposes, or 5 days due to unforeseen circumstances. However, we will always provide water to Southern Water if we are physically able without jeopardising the supply to our own customers. For example, in both January and October 2024 we increased our bulk supplies to support Southern Water in the west with just hours' notice, when they experienced outages at their Hampshire sources. On both these occasions we supplied volumes of water that exceeded the contractual volumes.

When the current contractual arrangements are due for renewal in 2026 and 2029, we will negotiate the terms with Southern Water that reflect the future indications of the WRMP24. We prepared a joint appendix with Southern Water which sets out all joint commitments and common understandings and can be found on our website as part of our published Final WRMP24⁸ (see Appendix 1C of the plan).

Whilst the Portsmouth Water and Southern Water WRMP24s assume that 30 MI/d is transferred every day in a drought year during AMP8 (see Figure 4), sensitivity testing in Appendix 1C of our WRMP24 has demonstrated that the export to Southern Water's Sussex North Zone can be constrained to 5 MI/d in a drought (see Figure 5) whilst still achieving a supply demand balance for both companies. No equivalent sensitivity testing was completed for the bulk supply to the Hampshire Southampton East Zone under a drought scenario, as this supply is more critical owing to the pressure on the supply demand balance experienced by Southern Water in their Hampshire zones.

⁸ Portsmouth Water, October 2024. Our Water Resources Management Plan 2025-2075. Located here: <u>https://www.portsmouthwater.co.uk/news/publications/water-resources-planning/</u>

Figure 4: Utilisation of the 15MI/d capacity exports from Portsmouth Water to Southern Water's Sussex North Zone (right) and Hampshire Southampton East (left) zones under normal (top) and severe drought (bottom) conditions.



Figure 5: Sensitivity test that caps the Portsmouth Water to Southern Water Sussex North Zone to 5 MI/d under normal (left) and severe drought (right) conditions.



The WRMP24 sensitivity testing demonstrated that bulk supplies to Southern Water totalling 20 MI/d (15 MI/d west and 5 MI/d east) would be sufficient to allow Southern Water to maintain supplies to its customers in a severe drought. However, we recognise that risks to the environment are potentially increased, because there could be a greater reliance on Southern Water drought permit / order related abstractions.

The action plans within this response document demonstrate our ambition to reduce the supply demand deficit expressed within our AR24. Southern Water is aware that the existing deficits represent a risk to our ability to provide bulk supplies and we will continue to work with Southern Water to explore these risks further via our next annual review, AR25, and through the development of our next drought plan and WRMP.

We are also planning a review of how the bulk supplies should be represented within our AR25 and in the calculation of the Supply Demand Balance Index (SDBI), which is a reported metric for the Environment Agency's annual Environmental Performance Assessment (EPA). Reporting of contractual volumes instead of those in the WRMP has the potential to improve our SDB by at least 10 MI/d.

The above sections have provided further information on the supply-side components and a summary of actions can be found in Section 2.3. The next section addresses the demand-side components.

2.2.4 Demand-side components in 2023-24

Our headline measure of demand is Distribution Input (DI) which is the amount of water we put into our network each day. Our outturn annual average DI for 2023-24 was 177.90 MI/d which is 3.75 MI/d **higher** than our rWRMP19 forecast for the same year, but 2.6 MI/d **lower** than our Final WRMP24 forecast of 180.50 MI/d for the same year. This means that although DI had a negative impact on the SDB when compared to rWRMP19, we are below forecast (outperforming) relative to our Final WRMP24.

The reason for the significant increase in forecast DI between the rWRMP19 and Final WRMP24 is that we rebased our forecasts for Final WRMP24 i.e. we moved from a base year of 2019-20 to 2021-22. Our Final WRMP24 accounts for the increased household demand we experienced because of the Covid-19 pandemic and also a more up to date leakage position.

The components of DI are Leakage, Consumption (household and non-household), Water Taken Unbilled and 'Distribution System and Operational Use' (DSOU). Water taken unbilled and DSOU contribute only a small volume of demand and were broadly in line with our WRMP forecasts, therefore this section focusses on the two primary components of DI i.e. leakage and consumption.

Figure 6 below shows how our outturn DI values for 2023-24 compared to our rWRMP19 and Final WRMP24 forecasts for the same year, and the contributing elements of total leakage, household and non-household consumption.



Figure 6: Demand side components – Outturn vs Forecast – Annual average mega litres per day

As shown in Figure 6, our outturn leakage and non-household consumption values are higher than the WRMP forecasts, whilst household consumption is lower than forecast. This is explored further in the next sections.

2.2.5 Leakage

Regulators have expressed specific concerns relating to our leakage performance. Please refer to Section 3 for additional information on our current approach to leakage reduction and associated action plan.

2.2.6 Non-household consumption

As described above, our non-household consumption is higher than our WRMP forecasts. Our outturn value for 2023-24 was 32.62 Ml/d. When comparing this to our WRMP19 forecast for 2023-24, it is only 0.68 Ml/d above forecast. However, as we look towards the beginning of our WRMP24, we are targeting a reduction in total NHH consumption, down to 29.79 Ml/d by the end of the 2024-25 reporting period. To reach this target we will require a total annual average NHH consumption reduction of 2.83 Ml/d by April 2025.

The Environment Agency provided feedback to us separately about this matter in a letter dated 9th September 2024. We addressed their concerns in our response on 1st November 2024, where we provided our 2024-25 and AMP8 non-household water efficiency programmes to bring consumption in line with our WRMP24 target.

For more information, please see our recent response to the Environment Agency's letter in the appendix of this document. However, in summary:

- There was a significant reduction in NHH consumption in 2020-21 due to the Covid-19 pandemic. Since then, NHH consumption has slowly increased up to 2023-24.
- Our current view is that the cost of living crisis elevated the 2022-23 non-household demand above forecast levels where it has remained for 2023-24.
- We are aiming to target the top 1% of water users to collectively reduce their water consumption by 2.85 Ml/d from 14.7 Ml/d to a spot value of 11.85 Ml/d (a reduction of approximately 20%) by April 2025.

Our detailed non-household action plan is summarised in Figure 7 below and following resourcing issues has been re-baselined since it was initially included in our response to the Environment Agency.

	24	24	24	24	24	24	24	24	24	-24	-24	-24	-24	-24	25	25	25	25	25	25	25	25	25	25	25	25
week commencing	30-Sep-	07-Oct-	l4-Oct-	21-Oct-	28-Oct-	-VoV-40	L1-Nov-	L8-Nov-	25-Nov-	12-Dec-)9-Dec-	l6-Dec-	23-Dec-	30-Dec-)6-Jan-2	l3-Jan-2	20-Jan-2	27-Jan-2	3-Feb-	-Heb-	L7-Feb-	24-Feb-	3-Mar	LO-Mar-	L7-Mar-	24-Mar-
Agree data resource	.,					Ŭ					0			.,	0								0			
extract data 1% highest users																										_
Idetify conitinous flow																										
Understand retailer requirements																										
Plan approach																										
convert graphs																										
design coms																										
Idenitfy retailer																										
send coms																										
review consumption changes																										
report reductions																										

Figure 7: Non-Household Consumption - Action Plan for 2024-25

The above detail is reflected within our summary action plan in Section 2.3.

2.2.7 Household consumption

As shown on Figure 6, our reported total household consumption value for 2023-24 was 114.17 Ml/d which is 0.85 Ml/d **lower** than our rWRMP19 forecast of 115.02 Ml/d, and 7.19 Ml/d **lower** than our Final WRMP24 forecast of 121.36 Ml/d for the same year. We are therefore **on track** to meet (and exceed) our total household consumption targets as we begin WRMP24 and move forwards into AMP8.

Our outturn total household consumption values are such that this component contributes positively towards our DI and will offset other demand performances where outturn values are higher than predicted. This is even more so the case when we look towards WRMP24 as we are **outperforming** on total household consumption by 7.19 MI/d, although we recognise that outturn DI might have been higher if 2023-24 had been a dry year.

Alongside overall average household consumption, we also look at consumption through the lens of Per Capita consumption (PCC). The Regulators have expressed concerns over our household PCC, specifically that linked to non-metered properties and with our progress on installing meters. We acknowledge and understand these concerns and they are addressed in Sections 4 (PCC) and 5 (Metering).

The above sections have provided further information on the supply-side and demand-side components and a summary of actions can be found below in Section 2.3.

2.3 Action plan for the supply demand balance issue

We have set-out our water resources position and our supply demand balance for 2023-24 in the sections above. This has identified that the key drivers behind our SDB deficit in 2023-24 were:

- DO reductions, outage and raw water losses being more than forecast (by 11.85 Ml/d).
- Leakage being more than forecast (by 3.93 MI/d)
- Approach to the reporting outturn volumes rather than theoretical maximum volumes for bulk transfers in the SDB.

Within Table 2 we have summarised our action plan for the improvement of the supply demand balance in 2024-25 and beyond.

Table 2 Action plan for improvement of the supply demand balance

Supply demand balance delivery actions	Target date	status	WRMP24 estimated benefit (annual average, MI/d)
Actions towards limiting future DO reductions			
Source G : Complete water quality sampling and bring this source back into supply.	April 2025	On-going	1.52
Source S : Following the completion of maintenance works, bring this source back into supply for 2025-26.	April 2025	On-going	1.93
Source O : Following the completion of a water quality improvement scheme, bring this source back into supply for 2025-26.	April 2025	On-going	2.84
Sources I : Continue to explore options to bring this source back into supply.	Early AMP8	On-going	1.41
Source D : Lower priority for return to supply. Consider need via drought forecasting.	During AMP8	On-going	0.81
Total			8.51
Actions towards limiting future water losses			
System monitoring strategy project: Complete review of our most complex sites.	January 2025	On-going	-
Hydraulic modelling : Full update (100%) of hydraulic models.	January 2026	On-going	-

System monitoring strategy project & hydraulic modelling: Identification of best value options to reduce water losses.	March 2027	On-going	Unknown at this stage
Actions towards limiting future outage			
Outturn outage for 2024-25: We are currently forecasting that we will outperform the forecast outage allowance (i.e. on track). Provide an update for the Joint Regulators meeting.	January 2025	On-going	2.19
Reporting unplanned outage in AMP8 : Discuss with the Environment Agency a pragmatic approach around how to report outage in future annual reviews (i.e outage due to high groundwater levels, nit applicable to dry weather scenarios/risk)	March 2025	On-going	Up to 3
Actions to explore risks to, and availability of, bu	lk supplies		
Continue to work with Southern Water to explore bulk supply related risks via our next annual review, AR25, and through the development of our next drought plan and WRMP.	2024-25 and during AMP8	On-going	-
Review, with the Environment Agency and Southern Water, how the bulk supplies should be represented within our AR25 and in the calculation of the Supply Demand Balance Index (SDBI)	April 2025	On-going	Potentially > 10
Actions towards reducing leakage			
Please refer to Section 3	-	-	-
Actions towards reducing non-household consur	nption		
Target the top 1% of water users to collectively reduce their water consumption.	April 2025	On-going	2.85
Actions towards reducing Per Capita Consumption	on (PCC)		
Please refer to Section 4	-	-	-
Actions towards increasing metering			
Please refer to Section 5	-	-	-
Actions towards supply scheme delivery			

Please refer to Section 6

3. LEAKAGE

3.1 Issues and actions raised in the regulators letter

The Joint Regulators are pleased to see that the proactive plans we have put in place have resulted in a reduction in leakage over the past year compared to the increases seen over the previous two years. However, our reported leakage of 28.19 Ml/d in 2023-24 is 16% above our rWRMP19 forecast of 24.26 Ml/d which contributes towards the SDB deficit and may increase the volume of water taken from the environment and could cause deterioration in the status of water bodies. To be on track to meet our rdWRMP24 starting position for total leakage of 24 Ml/d by April 2025, we need to continue to deliver leakage reductions similar or greater than those seen in 2023-24 which is also reputationally important as we are asking customers to reduce water use.

We have been asked to provide:

- · An action plan with benefits in MI/d and dates of delivery for each action
- Update on progress with delivery of the actions plans, our performance against rWRMP19 forecasts and our WRMP24 forecast starting position for total leakage to the Joint Regulators during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

3.2 Response

As shown in Figure 6 (see Section 2.2.4), our outturn total leakage for 2023-24 is 28.19 Ml/d, which is 3.93 Ml/d and 2.19 Ml/d higher than the WRMP19 and WRMP24 forecasts for the same year, respectively. Although this has contributed negatively towards our DI and subsequent SDB when compared to our rWRMP19 plan, we are currently tracking our WRMP24 overall DI assumption owing to lower consumption, which puts us in a reasonable position as we enter AMP8. Despite this, it is important that we continue to reduce our leakage levels and focus our efforts on achieving all our WRMP targets, designed to maintain security of supply and protect the environment.

Leakage reduction is a priority for Portsmouth Water and one of the key metrics against which we measure our performance. The sections below describe our leakage reduction delivery plans for the remainder of this AMP and looks forward to our comprehensive strategy to deliver our ambitious leakage targets throughout AMP8 and beyond.

3.2.1 Core principles of our leakage reduction delivery plans

3.2.1.1 Introduction

All our teams involved in leakage reporting, analytics, detection and repair activities are aligned with a common purpose – to reduce leakage. Over the last two years we have established a regular and operationally focused weekly briefing to establish our operational performance, identify blockers, barriers and issues for solution or escalation. To ensure the team are driven by quality as well as quantity, we don't measure performance based simply on the number of leaks detected but use a points-based methodology to also quantify the potential size of the leaks. Team, gang and personal performance is then accounted for based on the points detected and repaired.

The scoring system shown in Table 3 ensures priorities are given to what are likely to be the most impactful leaks.

Table 3 Scoring system for leaks

Possible Leak volume	Possible Leak location	Points score
+1I/s	Mains / Ferrules	20
0.4l/s	Service or Supply pipe	8
0.3I/s	Mains fittings	4
0.2l/s	Stopcocks	2

Our leakage teams are tasked with **locating and raising repair works orders** for 52 points of nonvisible leaks per day. We have regularly outperformed the weekly average target in Q1 and Q2 of 2024-25. Correspondingly, our **repair** teams are tasked and resourced to repair the same points value of leaks, always prioritising leaks of the highest score. Visible leaks, leaks that have come to the surface and are reported by either our staff or customers, are not part of this targeting scheme. We seek to repair all visible leaks within three working days of being reported to us, with great success in the year to date.

We monitor and discuss our performance against the points target in our weekly meetings. To a certain degree we can flex repair resource across all our network operations. Tracking the number and value of the outstanding repair Work In Progress (WIP) number is a performance indicator for our progress. Our weekly review of performance provides opportunities to forecast surges in work coming from leading indicators such as weather forecasts or lagging indicators such as leakage detection performance. This allows us to proactively manage resources and maintain our positive progress towards achieving our leakage target. An example of the Power BI dashboard used in our weekly performance reviews is shown Figure 8 below



Figure 8 Leakage Work in Progress

Performance is presented weekly in the form of Detection, Repair and Data:

- **Detection** We focus on points detected to maintain a rising target above 52 each week. We have regularly outperformed the weekly average target in Q1 and Q2.
- **Repair** We track the number of leaks repaired, the number of corresponding 'points' repaired (i.e. our classification of the leakage volume estimated from the leak enabling us to prioritise workload), and the total WIP. By providing this real-time dashboard, it has enabled the team to drive the WIP to 50 jobs, whilst also targeting the higher volume leaks, thus driving the detected instantaneous volume of leakage down.
- **Data** Each Week we track the availability of data points in the Network. We have over 1,000 pressure and flow sensors deployed, along with 5,000 Acoustic Fixed Sensors, which comprises our fixed data network. These sensors are critical in directing our focus for points of interest to follow up on, to determine leakage. We aim for 95% of our fixed networks to be operational with an acceptable level of maintenance of 5% WIP for replacement. By optimising our data availability, we will be confident in our reporting analytics and access to information to direct our employees to detect leaks.

Where we identify a consistent reduction in leak detection performance (i.e. in the creation of repair Work Orders or insufficient successive leak points created), we consider our bank of **Awareness** and **Locate** solutions (see below) to accelerate or issue instructions for increasing activities to maintain the feed of repair jobs.

When planning our interventions for the remaining period of this AMP, and looking forward to the challenges ahead, we have sought to use the PALM model – Prevent, Awareness, Locate and Mend.

The diagram below illustrates the theory, with the line on the graph being the volume of water lost from a leak over time. Our aim is to ensure the profile of a leak is minimised as much as possible – resembling the yellow line, rather than the blue.

Figure 9 Life of a Leak



Further information on the PALM Model and our on-going activities is provided below.

3.2.2 Prevent, Aware, Locate, Mend (PALM) Model

3.2.2.1 Prevent

Prevention is always better than cure. We have three initiatives currently running that seeks to prevent the occurrence of leaks:

- **Mains Renewal** We have a targeted mains replacement programme and are going to review the condition of our network infrastructure by exploring the use of non-destructive techniques to determine integrity and to prioritise the highest risk mains. Where practicable, we also look to remove PVC pipes from our network due to the significant disruption caused when this type of pipe fails.
- **Pressure Reduction Valve (PRV) Maintenance** We continually look to identify opportunities for pressure reduction and network calming, as well as prevention of failure which can lead to multiple bursts and leaks. This year we will perform a full service on all our mechanical PRVs. During this process, we are assessing, on a case-by-case basis, the future maintenance schedule, with a view to perform a major service at least every 3 years for the less critical valves, and annually for the most critical.
- **Modelling and digital twin** We continue to maintain and calibrate our network modelling tools and analytics, including increasing our internal capabilities, with the aim of working towards a digital twin that merges the smart network data with the modelling analytics. A digital twin model will allow us the manage our networks in near real time, as well as helping us with the development of our strategy for entire water supply system.

3.2.2.2 Aware

The sooner we become aware of a leak in a section of our network, the quicker we will be able to affect a repair. We have three initiatives in train that focus on our ability to identify the existence of new leaks in our network:

- Expansion of Pressure Controlled Areas - We have started a programme to review our Strategic Monitoring Areas (SMAs), and District Metering Areas (DMAs). Whilst we have sufficient coverage for leakage reporting, we recognise the need for these to be of a suitable size to assist us with leakage detection. In 2024-25 we have brought forward the programme and have installed a further (30) DMAs. We propose to front load the programme in AMP8 to achieve earlier leakage reduction benefits. We anticipate full coverage (where practicable) during AMP9. We believe this dual approach between Traditional DMA and digital AI open network solutions (such as virtual DMAs) will yield significant benefit to us gaining awareness of leaks in areas where we have significant levels of plastic derived mains. All new DMAs are being looked at for potential pressure management opportunities, and, where possible, a PRV is being installed along with the district meter. We also recognise that there will be areas where the formation of acceptable targeting areas would impact either water quality or potential for interruptions to supplies when incidents do occur. Therefore, we are exploring the wider use of AI service providers that are demonstrating success in the global sector. We will be exploring the potential of data analytics in a larger distribution zone including exploring the potential of the creation of virtual DMAs.
- Expansion of fixed network sensors We have invested in a more comprehensive fixed data network for leakage reporting and detection. We have greater coverage for identification of both terms of Household and Non-Household Night Use. This has included the installation of Average Zonal Pressure (AZP) data in every SMA, to bolster our Critical Points already installed in every SMA. We have also installed over 200 ABV loggers for increased visibility of seasonality, and a further 30 new Small Area Monitors (SAMs), representing over 2.5% of properties. These have been designed using ACORN classification to address demographic characteristics for usage profiling.
- **Satellite** We have implemented the use of more innovative technologies for detecting leaks including increased use of satellite technology, with specialist software to detect sub-surface conditions that might indicate leaks. These create 'Points of Interest' for follow up detection. We have seen significant success in 2024-25 with the engagement of this specialist service and are proposing to further increase the use of satellite sweeps into the next AMP.

3.2.2.3 Locate

Once aware of a leak, being able to exactly locate that leak and physically mark the location for repair teams to dig onto our network is a sophisticated skill. We have four initiatives currently underway this year to improve our speed and ability to exactly pinpoint the location of unseen leaks:

- **'Lift and Shift' Equipment -** We have invested in over 500 Fido Bugs that can be installed in discrete locations to focus the location of leaks.
- **Noise correlation loggers** We continue to utilise Enigma Noise Correlation equipment and HyQ mobile lift and shift hydrophones in sweeps of areas where our fixed network data is inconclusive.
- **Digital Sounding Sticks** We have invested in advanced leak sounding detection equipment for our technicians that have now been deployed as business-as-usual tools and all our leakage technicians have been fully trained in their use.
- **Technician Resources** We have increased our leakage team from a team of eight employees in 2022-23 to a total of 30 in 2024-25. This includes a combination of directly employed leakage technicians and contracted specialist leakage detection, as well as significant increases in the Leakage Office Team, which now includes additional analysts, an Asset Performance Engineer, various supervisors and administration support, and a Pressure Management Lead.

3.2.2.4 Mend

It is expensive in terms of time, materials and money to dig to expose our distribution network to make a repair. Being as efficient as possible in our repair activity is vital to the success of our leakage performance.

We are currently procuring our next generation Term Service Contract for Network Investment, development, Repair and Maintenance. The commercial approach is a complete change for Portsmouth Water where we will engage our contractor under a set of Service Level Agreements based on the categorisation of works. Rigorous Key Performance Indicators will ensure we can track performance and incentivise our Contract partner to respond to reactive work and optimise the planned work to ensure a more efficient use of the available resources.

3.2.2.5 Current Net Position

2022-23 saw the highest level of leaks detected and repaired for over 5 years, over double the amount detected and fixed in 2020-21. The net result of our interventions has resulted in a 4 Ml/d drop in leakage, from 32.2 Ml/d reported in 2022-23 to 28.2 Ml/d in 2023-24, the highest percentage reduction of any water company.

With the increased activity described in the preceding paragraphs, including the increase in leakage detection resource, the improvement in our detection abilities and the regular outperformance of our points target and outperformance, we anticipate a further significant drop of 4 Ml/d in reported leakage in 2024-25, which will significantly contribute to recovering our position. This may not achieve the Ofwat performance commitment, based on a three-year rolling average, but we anticipate and are committed to delivering a level of performance when measured as an annual average figure that will allow the commencement of WRMP24 in line with our assumptions.

3.2.3 Leakage Methodology update

Leakage is a key issue for our customers and consistent and accurate reporting over time is critical.

Over the last 18 months we have been working to enhance our leakage reporting for AMP8 by moving to a fully bottom-up, DMA-based calculation as well as assessing trunk mains and service reservoir losses. We are currently running our updated methodology in shadow form; we will have a full year's data available on the updated methodology by 31 March 2025 and will be able to back-cast the new methodology to understand the historic impact. We have liaised with Ofwat through our Draft Determination response and a further meeting to discuss our timeline and intent to re-base leakage in Year 1. We will continue to communicate our progress. When we have the dataset in an interim position for Q4, we would like to discuss the implications for our AMP8 leakage performance commitment targets.

Because any change in leakage calculation methodology will have to encompass the full water balance, which is predicated on the volume of water extracted from the environment, it will not impact the supply demand balance in the WRMP24. However it might change our current understanding of the volumes of water currently assumed to being lost or consumed, which may lead to better targeting of interventions to deliver demand reduction impacts.

3.2.4 AMP8 interventions, 2025 and beyond

Our strategy for AMP8 builds on the work we have undertaken throughout AMP7 and once again covers the breadth of the PALM model. Full details of our strategy can be found in an appendix to our newly published WRMP24, but for convenience is summarised below:

3.2.4.1 Prevent

We will continue with our PRV servicing programme and network optimisation to find opportunities to identify pressure reduction and network calming.

We propose to increase the number of PRVs for pressure reduction opportunities and calm networks.

As part of a wider review of business preparation for AMP8, the company is investing in our Asset Management directorate and introducing increased resources for Data Intelligence and Engineering. This will allow a more targeted mains replacement programme for improved network performance. Mains replacement will be subject to an Ofwat Price Control Delivery (PCD) against which our performance will be closely monitored.

3.2.4.2 Aware

The largest element of our AMP8 strategy will be to harness the data provided by the smart metering programme, combined with the existing data on pressure and flow, to increase the effectiveness of our leakage detection resource. Being able to track increases in water consumption on a daily basis will speed up our awareness and response times and ensure leakage detection teams are targeted to areas where consumption is not the driver of flow increases, which is currently not possible.

To ensure we leverage the maximum advantage from the smart meter data, we will continue our investment programme to increase the penetration of DMAs as acceptable targeting areas for leakage detection. We will do this whilst we pilot innovations for virtual DMA solutions and open network data.

We propose to increase the use of satellite technology to generate Points of Interest for our detection teams. We will be trialling coupling the use of leakage detection dogs with satellite technology to aid our trunk main and rural area follow up work.

We will fully implement the use of our Waternet analytics for leakage and consumption data processing, utilising over 104 SMAs, representing an approximate coverage of 96% of properties. Trunk main leakage will be calculated in Waternet and refined to improve the visibility of our upstream Flow Monitoring Zones performance.

We will be replacing and upgrading over 1,250 pressure loggers which form part of our fixed network data points. These loggers are a drive by a data collection system which was installed in our rural network five years ago, prior to the widespread deployment of NBIOT communications. We will now look to replace these with an NBIOT solution similar to the rest of our fixed network suite, which will enable daily data with no requirement for manual intervention other than routine maintenance.

We also plan to trial the use of micro-pressure variation loggers in our newly formed DMAs and seek to identify and install them on our plastic network, an effective equivalent to our current fixed acoustic logger network on our metal pipes.

3.2.4.3 Locate

We are planning to expand our direct labour leakage detection team and propose to recruit trainee technicians in 2025-26, to increase resilience to the team and to provide opportunities for department growth and development of skills. We will also be procuring our next generation leakage detection term service contract in 2025-26 to set out improved service levels to maximise productivity and incentivise on performance.

We will be commencing a re-procurement exercise to appoint a new Framework Leakage Detection Service Provider longer term. We anticipate that this contract will mobilise in summer 2025, increasing the resources deployed for leak detection and improving our resilience. This will also be a next generation contract that will be more performance focused than the current arrangements.

We will continue the use of lift and shift technology through FIDO Bug acoustic sensors which have proved to be a useful tool to support our leakage detection teams. We will also continue to utilise the Iquarius sounding technology, building further on the successes of the last two years.

In addition, we are planning to increase the use of correlators and ground microphones, trial the use of leakage detection dogs to assist with trunk main leakage and work with WRc to trial their Network Hotspot tool to improve leak targeting, accelerating the detection time.

3.2.4.4 Mend

In May 2025, we will mobilise our next generation Term Service Repair and Maintenance Contract transforming the service to a performance based commercial model to incentivise the contractor's performance. This will include fully outsourcing our Repair and Maintenance teams for greater efficiency with the contractor's performance monitored as part of a performance base commercial model.

Finally, we will have fully communicated and implemented our customer supply leakage policy to prepare for smart metering, which will likely see an increase in the detection of customer side leaks. We will be increasing customer engagement and providing a contribution to the customer for repairing leaks.

3.2.5 Industry Engagement

From an innovation and collaboration perspective, we will continue to participate in the WaterUK Leakage forums, and work with partners such as UKWIR, WRc, RPS and Dayworth to identify, test and select solutions to support meeting our challenges. We will also continue to participate and contribute to the National Leakage Test and Research Centre (NLTRC) for advancement in the sector.

3.2.6 Internal assurance

To ensure that our revised methodology is successfully implemented, we will continue with our monthly leakage strategy reviews and are planning to introduce more frequent internal periodic assurance processes and external reviews.

3.2.7 Action plan for leakage reduction

To ensure we commence WRMP24 with leakage levels in line with our assumptions, we have a comprehensive plan in place today to recover our performance in the short term. We have a future strategy, anchored on better data coming from increased quality of sensors on our network the implementation of our smart metering programme and the application of the latest industry best practice and innovations, to continue to drive leakage down to the record low levels we are targeting.

A high-level summary of activities is provided in Table 4 below and a more detailed programme is provided in Figure 10. We will continue to update our Regulators on progress, including via 6 monthly meetings.

Table 4 Action plan for reducing leakage

Leakage reduction actions	Target date	status	WRMP24 estimated benefit (MI/d)
 PALM model activities (2024-25): Continue with our existing suite of successful activities and overall approach to leakage reduction until the end of 2024-25. Including; Maintained detection resource. Added detection benefit from new DMAs Added detection benefit from expansion of fixed network Added detection benefit from satellite data Added detection benefit from mobile acoustic sensors 	March 2025	On-going	4
Re-basing leakage : Continue to communicate our progress to Ofwat on our intention to re-base leakage in Year 1.	March 2025	On-going	-
 PALM model activities (AMP8): Continue with our AMP8 strategy as outlined in this response document. Maintaining our target to detect and repair 52 points of non-visible leaks per week. 	During AMP8	-	Annual target In line with WRMP24

Figure 10: Programme of leakage reduction activities



4. PER CAPITA CONSUMPTION (PCC)

4.1 Issues and actions raised in the regulators letter

Reported household PCC of 154 l/h/d is 1.6 % above our rWRMP19 forecast of 151.49 l/h/d which is the joint highest in England. Unmeasured household daily consumption was 80.63 Ml/d, which is 10.7 % above the rWRMP19 forecast of 72.81 Ml/d and is contributing to our DI exceeding the WRMP19 forecast. The Joint Regulators are particularly concerned as 2023-24 was a normal/wet year, so it would be reasonable to expect this to have been higher should the year have turned out to be a dry year.

Our regulators consider that the high household consumption is contributing negatively to our SDB deficit and is an on-going issue that presents a continued risk to our customers security of supply. They note that high demand may also increase the volume of water taken from the environment and could cause deterioration in the status of water bodies.

The Joint Regulators have asked us to provide:

- An update of our PCC action plan with new actions to reduce PCC, especially unmeasured household consumption.
- The action plan should include timelines and the expected I/h/d benefit from each of the actions we will undertake.
- Update on progress with delivery of the actions plans and our performance against rWRMP19 forecasts and WRMP24 forecast starting position for average household PCC to the Joint Regulators during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

4.2 Response

Our Final WRMP24 sets out our long-term PCC target to reduce dry weather scenario PCC below 110 l/h/d by 2050 for domestic households, with an element being delivered by our own engagement with customers and the assumption government interventions will deliver the balance. This is a 27% reduction on 2020 demand numbers. The following sections provide detail on our PCC performance for both measured and unmeasured PCC, and the action plans to address the Regulators' concerns.

As described in Section 2.2.7 above, our total daily average household consumption for 2023-24 was 114.17 MI/d, which is **lower** than both our rWRMP19 and Final WRMP24 forecasts of 115.02 MI/d and 121.36 MI/d respectively. This means that we are **out-performing** our forecasts in terms of total household consumption, particularly compared to the Final WRMP24. The key reasons for this are:

- We moved from a base year of 2019-20 for the rWRMP19 to a base year of 2021-22 for the Final WRMP24. Therefore our Final WRMP24 accounts for the increased household demand we experienced because of the Covid-19 pandemic.
- The total population figure for our supply area was updated from 759,280 to 736,660 for the Final WRMP24 based on new 2021 Census data. This demonstrated that the population is lower than forecast by the rWRMP19 i.e. there are less people requiring a water supply and hence household demand has reduced.
- Furthermore, 2022-23 was a wet year. If it had been a dry year, outturn PCC would have been higher.

The primary PCC metric that we are measured against is our **average** PCC which is a combination of both measured and unmeasured PCC levels (i.e. using measured and unmeasured household consumption, divided by the population).

Despite out-performing on household consumption, average PCC was higher than targeted in the rWRMP19, as demonstrated by Table 5 below. However, if considering the updated Final WRMP24 consumption forecast, we were **outperforming** the 164.7 I/h/d target PCC in our Final WRMP24. This is mostly due to the 2023-24 being a wet year. As recognised in our AR24, if 2023-24 had been a dry year with no impact from demand restrictions, we might have seen an average PCC of 166 I/h/d. This is marginally higher than the Final WRMP24 forecast and demonstrates that we must continue our efforts to reduce PCC now and into the future.

Table 5 Total household consumption and average PCC for 2023-24

Total Household	Population	Consumption (MI/d)	PCC (l/h/d)
Outturn (Annual Review 2024)	739,630	114.17	154.4
rWRMP19	759,280	115.02	151.5
Final WRMP24	736,660	121.36	164.7

In the next section we provide an update of our PCC action plan to reduce PCC, with a focus on unmeasured household consumption as requested by our Regulators. We have included a look ahead into our AMP8 water efficiency strategy.

4.2.1 Unmeasured Household PCC

In July 2021, Environment Agency (EA) reassessed which water companies are under serious water stress. This is defined as being where:

"the current household demand for water is a high proportion of the current effective rainfall which is available to meet that demand. Or the future household demand for water is likely to be a high proportion of the effective rainfall which is likely to be available to meet that demand'."

For WRMP19, our area was classified as being an area of 'moderate' water stress, but the EA's reassessment has reclassified our area to being in 'serious' water stress. This classification allows us to target water efficiency measures in those areas of greatest need and to achieve the greatest potential benefit through universal, compulsory, metering of household customers if it is shown to be beneficial.

It is important to note that with the implementation of WRMP24, the percentage of unmeasured households (and volume of water delivered) will significantly decrease over AMP8 through the roll out of our ambitious compulsory Smart Metering programme. However, the legacy impact of the 'water stress' status is that our ability to install meters has been heavily restricted to date, and around 65 % of our total population is represented by 'unmeasured households' (i.e. no water meter installed).

It follows that most of our population is represented by the unmeasured PCC trends shown in Figure 11 below and our PCC action plan is targeted primarily at this audience. Figure 11 shows how our

unmeasured PCC has changed over time as reported within our Annual Reviews, against the same component within our rWRMP19 and Final WRMP24.



Figure 11 Unmeasured PCC – outturn vs forecast – litres per head per day

Despite our programme of water efficiency interventions, significant external factors have heavily influenced customers water use habits over the course of AMP7. The primary factor in 2020-21 was the Covid pandemic which significantly increased our unmeasured household PCC to nearly 180 l/h/d. As Covid lockdown restrictions were lifted, levels fell to 167 l/h/d the following year.

A new Artesia study⁹ has investigated the impact of the pandemic on consumption patterns. It reveals how these shock events initially impacted and continue to impact water use behaviours. An initial transition to home working and then a residual pattern of increased hybrid working resulted in a dual impact on demand. Overall demand is higher due to the occupancy of less water efficient spaces in working hours, whilst household consumption has increased due to higher daytime occupancy. The report also shows that these impacts have themselves been influenced by the cost-of-living crisis. Families spending more time at home due to money limitations and taking more UK based day trips rather than longer holidays abroad has been offset by more money conscious behaviours. The Artesia study concludes that the average annual aggregate net impact of shocks on household water use between 2020 and 2023 was +6 %.

The lowest levels of unmeasured household PCC occurred during 2022-23 when we experienced hot dry weather in the summer of 2022. However, this dry weather event prompted nationwide drought awareness, enhanced communications campaigns and the implementation of water restrictions by our neighbours Southern Water, all of which we believe supressed our customers' use of water over and above the effect of our own campaign.

⁹ Artesia and Frontier Economics, 2024. Water use shock event effects and future regulatory treatment. Phase 2 Report.

It is important to recognise that the Covid, cost-of-living and dry weather events that significantly impacted the water consumption habits of our customers were completely beyond our control. However, we are committed to maintaining our programme of water efficiency work to influence as many customers as we can to use water wisely to protect the environment and safeguard our security of supply.

For the remainder of AMP7 (2024-25), we continue to focus on influencing household water consumption, primarily through an **Engagement Platform and broadcast communication**, **Smart meter trials**, and **home visits**, which we expand on in the sections below.

AMP8 will see the roll out of our Smart Metering programme which will significantly reduce the number of unmeasured households and reduce customer demand for water. In addition to this, throughout AMP8, we will continue to implement our water efficiency programme to reduce PCC.

The following sections provide further details on our PCC Action Plans.

4.2.2 Engagement platform & Broadcast communications (2024-25)

Our flagship engagement platform, GetWaterFit³, has been our key route for influencing the amount of water customers use during AMP7. It is a mobile-friendly branded platform run by Save Water Save Money where customers can complete a survey on their household usage, order free water saving devices and complete regular water efficiency challenges aimed at reducing consumption. The platform provides:

- · Free access to water saving devices, tailored to customer needs.
- Gamification of personal and household water efficiency challenges.
- · Incentivisation through community support initiatives.
- Campaigns such as leaky loos and dripping taps, where we provide free leaky loo strips to help detect leaking toilets and highlight how much water is wasted through a faulty cistern as well as advertising a list of Water Safe approved plumbers.

Throughout the course of the last 5 years the platform has grown from an initial trial, through to a concerted campaign that was amplified during the drought of 2022, where our efforts and connection with customers was at its highest level. This allowed us to link the situation in the present with the long-term challenges of water efficiency and conservation. Since the platform was launched in late 2020, we now have 11,955 customer households signed up to the website and who have taken part in water saving challenges, completed the survey and ordered free water saving devices.

We are continuously focused on increasing recruitment onto the platform and are targeting an additional 900 registrations by the end of this reporting year. Our working assumption based on industry experience in our WRMP24 water efficiency strategy is that each participating household makes a saving of 15.1 l/h/d through the installation of water efficiency gadgets ordered through the site, based on industry data.

The graph below in Figure 12 shows that we experience a seasonal demand for the gadgets, with the majority being ordered over the autumn and winter periods from August to February.



Figure 12 Historic and estimated gadget orders through Get Water Fit

We have tailored our seasonal marketing campaigns to maximise our uplift of customers onto the platform:

- Our winter campaign is running from November 2024 until February 2025 and focuses on helping customers prevent or reduce water loss caused by the colder winter weather. During this time, we will offer free external tap jackets and lagging to protect internal and external pipework from freezing causing damage and leaks.
- In the Spring between February 2025 and May 2025, we focus on preparing for summer, particularly aiming at gardeners and garden use of water. This includes promoting our offer of subsidised water butts helped by explaining the nutritional benefits for plants of using stored rainwater over mains water. We will also continue with our general water saving messages including tips to reduce usage in the home and promoting Get Water Fit.

Our internal communications and marketing team has recently grown and have been onboarded to support with the water efficiency communications. We have improved our branding and consistency in messaging throughout the business and are continuing to promote GetWaterFit to our customers through all channels available, including social posts, targeted paid Facebook & Google adverts, community engagement events and local publications, taking every opportunity to promote the platform and the opportunity it presents for all.

In addition, over the last 18 months we have also significant investment in our Customer IT stack to enhance customer engagement capabilities. Specifically,:

- A New Portal and Mobile App: Providing customers with modern, accessible tools for managing their water use, account details, and communications with us.
- Omnichannel Platform: Enabling seamless interactions across multiple channels (phone, email, chat, app), making it easier for customers to connect with us in their preferred way.
These advancements mean we are now more engaged with our customers than ever before. They represent a significant step forward in building a two-way dialogue with customers, supporting water efficiency efforts, and improving overall customer satisfaction.

Below in Figure 13 is a montage of material illustrating the look and feel of the material we produce.

Figure 13 Examples of social media creatives



4.2.3 Smart meter trials (2024-25)

The cornerstone of our demand reduction strategy for our WRMP24 is our universal smart meter programme. Switching to a metered bill is going to be a big change for our customers, who are likely to be understandably reticent about the change. In preparation for the full scale roll out in 2025, we are undertaking some small but significant trials of various elements of our proposed AMP8 programme which will help pave the way for maximum opportunities and benefits.

The first pilot will start in February 2025 with a total of 500 smart meters to be installed. These will be existing metered customers, who will have their units upgraded to smart meters and who will follow the 'metered to smart' journey where the following elements will be trialled:

- Physical meter installation Where we will be assessing the ease of technical connectivity.
- **Initial engagement with the customer** -to ensure that we have the most suitable form of engagement which will include an understanding of why we need to install smart water meters to promote sustainable behavioural change.
- Identifying water losses in a customer's property we will be trialling the processes for this. In a previous trial using the LeakBot device we found that 24% of our customers had an internal leak, wasting on average 30 l/h/d. Honing our processes to identify internal leaks and our policies to incentivise their repair will provide real time benefits this year, but more importantly will unlock significant benefits with the full roll out of smart meters starting in the latter half of 2025.

- Increasing water saving opportunities we are currently looking into the viability of fitting household scale flow control devices to 100 properties. Case studies from projects by other water companies have seen average daily water savings of 80.9 litres and we are keen to understand if we would achieve similar results with the characteristics of our distribution network.
- Assessing demand savings this will come from enhanced visualisation and engagement with their water use and line of sight to their bills.

We will be able to monitor and assess the demand savings from these trials which will reduce demand in the last quarter of 2024-25, but most importantly, will give us a robust understanding of the savings that we can achieve and how to maximise these during our AMP8 Smart Meter roll out.

4.2.4 Home visits (2024-25)

During AMP7 we have installed over 20,000 not-for-revenue meters which we will be converting to 'incharge' in early AMP8. We recognise that these customers may require support as they transition to charged meters, especially the higher water users who have the potential for higher bills after the change. Therefore, in the remaining months of 2024-25, we are planning to carry out 1,000 water efficiency home visits to support these customers.

Whilst quite common elsewhere in the country, this represents a first for our company and again, will provide valuable insight as we undertake the final design of the support package, we will be offering all customer as they receive a smart meter.

Our home water efficiency checks include a holistic service-offering to customers, providing:

- · Customised support and advice with understanding their bill and water usage,
- · Installation of new water efficient devices, and
- · Plumbing support to repair leaks on internal pipework including taps and toilets
- Customer feedback mechanism from visits to refine future support and drive continuous improvement.
- Links for households to wider customer potential benefits beyond water savings such as, affordability our vulnerability support.

By targeting the high users for home audits, our WRMP24 water efficiency strategy forecasts savings in the region of 60 l/d per property, based on industry data, for overall behavioural and usage benefit. This does not include the additional benefits of internal leaks fixed that our partners expect to locate at 1 in 10 properties. Repairing these leaks could deliver an additional saving of 250 litres per property on average. This achieves an average overall benefit of 85 l/d per property for homes visited in the programme.

4.2.5 Future PCC reductions (AMP8)

We have carefully considered all the options available to us to achieve the targets set out in our Final WRMP24. We have embraced innovation and believe that our approach to smart metering will set an industry benchmark. We have ensured that we are always seeking the best value point that delivers excellence for both our customers and for the environment.

Our demand reduction strategy for WRMP24 is summarised in the table below and can be found in full in Appendix 10B (Water Efficiency Strategy) of our WRMP24, published on our website¹¹.

¹¹ https://www.portsmouthwater.co.uk/wp-content/uploads/2024/10/10B-fWRMP24-App-Water-Eff-Strategy_published_final.pdf

Option Type	Description	Benefit
Physical	Plumbing losses – hyper-care leak fixing	Reduces the household losses that would be classified as demand
	Gadgets	Reduces the flow or consumption of water a plumbing fitting uses
	Household flow restrictors	Reduces pressure and therefore volume of wasted water in homes
	Leak Alarms (Leakbot)	Alerts customers to physical repairs required
	NHH Efficiency Checks / audits	Reduces the flow or consumption of water a plumbing fitting uses and fixing leaks
	Universal Smart Metering/metering	Proven to reduce water demand through consumption awareness
Behavioural	Home efficiency audits	Water efficiency messaging, but also "Physical" benefit through gadget installation
	Education	Sets up behaviours in future generations and the "nag" factor today
	Community Reward (Platform)	Individuals reduce consumption for community benefits
	General broadcast messages (multi-channel proactive comms)	Individuals reduce consumption through messaging that they relate to
	Community Campaign	Encourages participation in water saving lifestyle choices to gain rewards for the community they live in
	Innovative New Tariffs	Encourages reduced consumption driven by financial reward/penalty
	Vulnerability / Inclusion and Equality	Ensures that those in most need of support are provided with the tools and information that protects them.
	Leading by example	Demonstrating to customers that the journey is a shared one and that Portsmouth Water itself is doing everything it can to be water efficient.
Replacement	Subsidised water butts	Rainwater used instead of mains water for garden use.

Table 6 Summary table for WRMP24 demand reduction strategy

As we look forwards to the implementation of WRMP24 and AMP8, we believe that the universal smart metering programme, alongside these water efficiency activities will mean a marked reduction in customers' water use. The conversion from unmeasured to measured households for the majority of our customer base will also support a water wise population and encouraging trend in PCC as we continue towards our WRMP24 targets.

4.2.6 Action plan for reducing PCC

To ensure we commence WRMP24 with a PCC that is in line with our assumptions, we have a comprehensive plan in place today. We also have a future strategy, anchored on the implementation of our compulsory smart metering programme.

A high-level summary of activities is provided in Table 7 below. We will continue to update our Regulators on progress, including via 6 monthly meetings.

Table 7 Action plan for reducing unmeasured household consumption and PCC

PCC reduction actions	Target date	status	WRMP24 estimated benefit
Engagement platform & broadcast communications : Target an additional 900 GetWaterFit registrations by the end of this reporting year	End of March 2025	On-going	15.1//h/d for participating households
Smart meter trials: Install 500 meters, install 100 flow control devices, engage with customers, and where identified, incentivise the repair of leaks.	End of March 2025	On-going	Between 15 and 30 l/h/d for participating households
Home visits: Complete 1,000 water efficiency home visits	End of March 2025	On-going	60l per day for participating households
Future PCC reductions (AMP8): Deliver our water efficiency strategy as set out in our Final WRMP24.	During AMP8	-	Annual target In line with WRMP24

5. METERING

5.1 Issues and actions raised in the regulators letter

The Joint Regulators have expressed concern that we have not been meeting our target level of household meter penetration throughout AMP7 and that our 2023-24 reported metering penetration of 36.12% is significantly lower than our WRMP19 forecast of 44%. Our action plan to address our metering shortfall has not appeared to be successful in increasing meter penetration which will be likely to slow the delivery of PCC reductions.

The Joint Regulators are concerned that high demand and failure to achieve metering penetration targets may increase the volume of water taken from the environment and could cause deterioration in the status of water bodies.

We have been asked to provide:

- An update of our action plan to deliver our meter penetration target which should include encouraging optants and metering via change of occupier.
- Progress on the Not-For-Revenue meters installed and getting them to be charged by volume during early WRMP24.
- · Clear actions we will take, programme of works and dates for delivery
- Update on progress with delivery of the action plans and our performance against rWRMP19 forecasts and WRMP24 forecast starting position for metering penetration to the Joint Regulators during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

5.2 Response

As described in Section 2.2.7 above, the total household consumption for 2023-24 was below our rWRMP19 forecast and we are on track to meet (and exceed) our total household consumption targets as we begin WRMP24 and move forwards into AMP8 WRMP24 forecasts.

We acknowledge that our meter penetration is not where we would like it to be. We do have an action plan in place but would make the point our outturn household consumption is out-performing our rWRMP19 target and hence is not the factor that is resulting in an SDB position lower than the rWRMP19 forecast, and therefore is not contributing to a risk to our customers security of supply, or potentially increasing the risk of water body deterioration.

The primary reason for our existing low meter penetration is the Environment Agency's 'moderate' water stress status for our supply area that was in place until June 2021. As explained in Section 4.2.1, the legacy impact of the 'water stress' status being less than 'serious' is that our ability to install meters has been heavily restricted to date, and around 65 % of our total population is still represented by 'unmeasured households' (i.e. no water meter installed). Now that the Final WRMP24 is published, for the first time we can begin compulsory metering from the 1st April 2025.

Until the start of AMP8 we are restricted to Change of Occupier (COO) metering when customers move house, and Optant metering when customers choose to have a meter fitted. As explained in our AR24, our rate of COO meter installations this AMP was initially lower than forecast due to the reduction in COO opportunities (i.e. there has been a decline in house moves), driven by the cost-of-living crisis and less favourable stamp duty policies. Additionally, most customers who are willing to convert to a meter (Optants), have already done so, and therefore recruitment rates for optant meters are declining.

Despite this, metering is the most significant and reliably effective intervention we can make to influence our customers water use and we completely recognise the Regulators' concerns and understand the importance of bringing our meter penetration rate in line with the WRMP to achieve our long-term targets. Furthermore, reduced household consumption will help to compensate for any future underperformance in other components of the SDB.

We are committed to delivering the meter installations we planned and, in the sections below, we detail our action plans to recover our meter installs by the end of the AMP, including our plans for Optant and COO installs, and an update on our Not-For-Revenue meter programme.

5.2.1 Meter installation forecasts and strategy (2024-25)

In 2023-24, we fell short of 506 in-charge meters. Despite the challenging conditions described above, we are targeting the installation of an additional 506 meters in 2024-25 to ensure that our AMP7 Final WRMP24 target of 38.4% meter penetration rate is achieved.

The numbers in Table 8 below show how many meters we are forecasting to install in 2024-25 according to the Final WRMP24, plus the additional 506 meters rolled over from 2023-24, and how we are performing 7 months into the reporting year (the current outturn), which runs from April to March. It also provides the expected outturn after 12 months at the end of the reporting period.

Meter Installation Category	Final WRMP24 Forecast	Total planned (incl. additional 506)	Current Outturn	Target EOY outturn (end of March 2025)
Optants	1,494	1,494	757	1,343
СОО	2,302	2,847	1,101	2,712
Voids	0	0	451	616
Total 'In-charge'	3,796	4,341	2,309	4,671
Meter Penetration (incl. voids)	38.4%	38.4%	-	38.4%

Table 8 Expected End of Year (EOY) outturn meter installations for 2024-25

We appreciate there are only 5 months remaining in 2024-25, including the Christmas period, and there have been some integration issues between our new CRM system and work order management system, which are now fixed. To mitigate this we are aiming to boost the number of installs through metering at void properties, to help mitigate any slow down on COO or Optant metering so that we finish on a meter penetration of 38.4 %.

We are also maximising the number of jobs raised against total opportunities by raising our installations efforts on flats, which were previously avoided due to the potential high likelihood of having a joint supply and therefore cancelled jobs.

We will also be increasing our promotion of Optant metering with plans to;

- · Focus within our Winter and Spring seasonal broadcast communication on promoting metering,
- Distributing literature promoting metering through the course of other activities (such as mains renewal and WQ sampling),
- In the new year, proactive outbound calling to customers who we believe would benefit from a meter.

We continue to monitor the numbers closely, reporting installs against forecast fortnightly to keep the teams informed of progress and show how our current performance would impact the end of year target.

Furthermore, we share the water scarcity message on our social media platforms, our social media campaigns and marketing initiatives, and through or new customer portal and mobile app. We link this messaging to how metering is proven to reduce usage and protect water supplies and the environment. Customers are directed to our water saving page¹² on our website which has a host of advice around saving water as well as promoting the benefits of meters. The page includes a link where customers can sign-up for a meter.

5.2.2 Not-For-Revenue programme update

Between December 2022 and December 2023, we scaled up our meter installation teams to install an additional 20,000 not-for-revenue meters onto empty boundary boxes following the mains renewal programme. We did this to demonstrate that we have the capability to scale up meter installations in preparation for compulsory metering with the intention that these customers would become early switchers to measured charges as soon as we can commence compulsory metering (from April 2025). In this way we can increase our meter penetration to around 45% (including voids) and closer to the rWRMP19 target.

This will be the first instance of taking our customers on the unmetered to metered journey, facilitated by WRMP24 and a misstep could resonate through our entire future smart metering programme. Therefore we are working with professional marketing and behavioural change experts to ensure we have effective messaging, together with planned customer journeys to ensure that these customers are supported through the transition to metered charges, to both reduce bill shock, and to ensure a positive experience. We are planning the transition to be supported by water efficiency advice and free water saving gadgets such as shower heads and tap aerators. We will also offer home visits aimed at the highest users to assist with tailored advice and leakage repairs. Furthermore, we are also in the process of introducing transition tariffs to give customers early visibility on the impact the meter bill will have on them once they are switched over.

The plan is to have all 20,000 customers transitioned to metered charges by December 2026. In order to ensure this, we will move these meters into our CRM system by March 2025 and begin sending the initial communications from April 2025.

We are expecting to introduce a 'lowest bill guarantee' for these customers. Our new CRM system will play a key role in clearly presenting their new metered charges will compare to their existing charges. This transparency will help to build trust and reduce resistance, ensuring customers feel informed and supported throughout the transition.

¹² https://www.portsmouthwater.co.uk/environment/saving-water/

From the beginning of 2025 we will begin reading the meters depending on where they fall in the 6 monthly read routes. The meter readings will give us and the customer information about their usage and what impact it is likely to have on their bill. We can then tailor the customer journey based on their circumstances. By staggering the readings, it will allow us to give each customer the same amount of time between the initial letter and their first bill as well as reducing the risk of overwhelming our contact centre through customer contact and meter readers with additional workload.

The outline programme described above is presented monthly at stakeholder meetings, with progress tracked against the plan and risks and issues addressed.

5.2.3 Action plan for increasing meter penetration

To ensure we achieve the levels of meter penetration within our Final WRMP24, we have a comprehensive plan in place today. We also have a future strategy, anchored on the implementation of our compulsory smart metering programme.

A high level summary of activities is provided in Table 9 below. We will continue to update our Regulators on progress, including via 6 monthly meetings.

Table 9 Action plan for reducing unmeasured household consumption and PCC

PCC reduction actions	Target date	status	WRMP24 estimated benefit (% meter penetration)
COO, Optant and void metering: Continue with our metering programme to achieve at least 4,341 'in-charge' meter installs during 2024-25.	End of March 2025	On-going	+ 1.2 %
COO, Optant and void metering: Continue sharing the water scarcity message on our social media platforms and direct customers to our water efficiency page, where they can opt in for a meter.	End of March 2025	On-going	-
Not-for-revenue meter conversion: Move 20,000 meters into our CRM system	End of March 2025	-	-
Not-for-revenue meter conversion: Initiate customer communications and begin reading the meters depending on where they fall in the 6 monthly read routes.	From April 2025	-	
Not-for-revenue meter conversion: Transition 20,000 customers to metered charges by June 2026	By June 2026	-	+ 3.9 %

6. SUPPLY-SIDE SCHEME DELIVERY

6.1 Issues and actions raised in the regulators letter

Our Regulators have specifically expressed concerns about the delivery of our supply-side schemes in our rWRMP19, including Havant Thicket. They have stated that the DO benefits of these schemes are accounted for within our rWRMP19 and WRMP24 DO forecasts and therefore any delays to the customer funded supply-side schemes will have a negative impact on our available supplies, which represents a risk to our customers' security of supply, and to the environment.

Our Regulators are concerned that we are reporting that the schemes have been delivered or are on track, but that we have not accounted for the MI/d DO benefit within our Annual Review reporting. Specifically:

- The schemes at Sources O, H & C are reported as complete in the data table, but no benefit has been included.
- Source J scheme has been removed from AMP7.
- Source S drought permit scheme is reported as 'on track' when it was to be delivered in 2020-21.
- The delivery of the Havant Thicket Winter Storage Reservoir (benefit 23 MI/d) has been deferred from 2029-30 to 2031-32, with its benefits being available from 2034-35.

To address these concerns, we have been asked to provide:

- A detailed action plan outlining our programme of work and the timeframes in which the revised delivery dates for these schemes will be met.
- A clear presentation of the risks associated with deferring or cancelling the schemes, including any potential impacts on resilience and the measures we will take to mitigate these risks.
- Details of any schemes that have been brought forward as a result of deferrals or cancellations this should demonstrate how our decision making for WRMP24 long-term planning has incorporated these adjustments.
- Update on progress with delivery of the actions plans and our performance against rWRMP19 forecasts for supply-side schemes and draft WRMP24 forecast starting position for supply-side schemes to the Joint Regulators during our 6 monthly meetings, and at the Quarterly Directors Meetings throughout 2024-25.

6.2 Response to the supply-side scheme delivery issue

In this section we describe how the MI/d DO benefit of DO improvement schemes at Sources O, H, C and J has been accounted for within the annual review calculations and provide further narrative on our drought plan related Source S scheme and the Havant Thicket Winter Storage Reservoir (HTWSR) scheme. We also set out the detailed programme of work and timeframes for outstanding schemes, highlight the risks of delayed delivery, and how these have been addressed via WRMP24 long term planning.

6.2.1 The rWRMP19 AMP7 DO improvement schemes

There are four AMP7 schemes within our rWRMP19 at sources O, H, C and J. None of these schemes are accounted for in the rWRMP19 forecasts for 2023-24, because they were all due for completion in 2024-25. Therefore, where a scheme has been completed early and realises any benefit, the benefit is an **addition** to the outturn DO (or, offsets other reductions).

We have completed three of our AMP7 schemes to date (Sources O, H and J) and one of our schemes (Source C) is ongoing. These are described further in the sections below, including if and how benefits have been realised, and how they have been represented in the AR24.

6.2.1.1 Source O improvement scheme

When groundwater levels at Source O lowered in response to the 2011-12 drought event, we needed to take it out of supply owing to unacceptable water quality, resulting in a loss of DO. The aim of the WRMP scheme was to mitigate water quality issues in a drought and restore DO. We have achieved delivery of this scheme early during AMP7 in September 2023-24 through the installation of an amazon filter system at the Source O treatment works.

In parallel to the delivery of the WRMP scheme, we have been progressing the design, installation and commissioning of a separate water quality scheme to install an Ultra-Violet (UV) unit at Source O. Whilst schemes such as this do not increase DO, they are necessary and allow us to continue providing an affordable, reliable and sustainable supply of high-quality water for our customers. However, they do result in temporary 'planned outages', as we need to take sources out of supply whilst we deliver improvements.

The way in which we have represented the benefits of the Source O WRMP scheme (the amazon filter system) is described in Section 3.1.1 of the AR24. In summary, the necessary planned outage for the water quality scheme resulted in a write-down of DO [2.6MI/d] in the AR24 that effectively offsets the benefit of completing the WRMP scheme early.

The planned outage at Source O has continued into 2024-25, although we expect to put the Source back into supply by January 2025. This will impact the DO reported in our next annual review, AR25, but the successful delivery of both the WRMP and water quality schemes is expected to improve the reliability of the source during AMP8 under both normal and drought conditions.

6.2.1.2 Source H improvement scheme

Our Source H was offline in 2019-20, 2020-21, and much of 2021-22 owing to long term water quality concerns. As there was a plan to bring the site back online, this was treated as an outage event in previous Annual Reviews rather than a loss of deployable output. Following installation of a UV unit at the Source H treatment works via the WRMP scheme, the source was put back into supply for 2022-23 and the scheme has significantly improved the reliability of the source, avoiding further longer-term unplanned outages or write-downs in DO.

Whilst the WRMP scheme has significantly improved the reliability of the source (reducing outage), new Python for Water Resources (Pywr) water resources modelling during AMP7 has indicated, contrary to previous understanding when the scheme was proposed, that it has not materially improved the baseline DO across the water resource zone as a whole. For this reason, and in line with a precautionary approach, we have not demonstrated the anticipated DO benefit of 0.4 MI/d from this scheme within the AR24 calculations.

6.2.1.3 Source J improvement scheme

The preferred options within our rWRMP19 included DO improvements at Source J. The aim was to drill, install and commission new boreholes, increasing the DO at Source J to facilitate a 9 MI/d increase in our bulk supplies to Southern Water.

We recognised uncertainties regarding the feasibility of the scheme, including Environment Agency concerns associated with sustainability (the importance of spring flow and potential impacts on designated environmental sites), which we acknowledged when the scheme was selected in WRMP19.

The uncertainties were also recognised within Southern Water's Final WRMP19 technical document¹³:

"There is some uncertainty around the sustainability of the scheme which Portsmouth Water intends to implement to provide the additional water for this bulk transfer but further work is planned to be undertaken by Portsmouth Water in conjunction with the Environment Agency to understand the availability of the water. We have considered the risks associated with this bulk supply option through inclusion of a scenario whereby this option is not available. This will help us to understand the sensitivity of the strategy to the 9MI/d bulk supply from Portsmouth Water and whether alternative schemes need to be considered."

Following completion of borehole investigations in AMP7 we concluded that the feasibility of the Source J WRMP scheme was compromised by insufficient yield and water quality. This was communicated to Southern Water and the Environment Agency, leading to the removal of the Source J DO benefits and the associated 9 MI/d bulk supply from the data sets that underpin our Revised Draft and Final WRMP24, and Southern Water's Revised Draft WRMP24.

In summary, the uncertainties associated with the Source J scheme were recognised in Southern Water and Portsmouth Water's WRMP19s. Whilst the scheme investigations have been completed, the Source J improvements and associated 9 MI/d bulk supply are excluded from Southern Water and Portsmouth Water's WRMP24, and the WRSE regional plan i.e. the benefits will not be delivered.

6.2.1.4 Source C improvement scheme

Historically our Source C has suffered from air and turbidity issues when running the larger borehole pumps. The purpose of the WRMP scheme was to mitigate these issues by commissioning new Variable Speed Drive (VSD) pumps to control levels of turbidity, allowing us to increase abstraction and improve DO.

At the time of writing the AR24, we expected completion of the scheme by the end of June 2024. Therefore in the AR24 'scheme delivery' data table we stated "Complete end June 2024. See annual review report", with further narrative in Section 3.5.1.4 of the AR24.

As described above, the rWRMP19 tables for 2023-24 do not assume any MI/d benefit from completed DO improvement schemes, as they were not due for implementation until 2024-25, including at Source C. As the scheme is yet to be delivered, the benefit of the WRMP scheme is not included within the AR24 calculations. Instead the benefit will be recognised in the AR25, in-line with our rWRMP19 and WRMP24.

Owing to a combination of challenges, including the need to provide Southern Water with a large bulk supply during September and October 2024, the delivery of the Source C scheme is delayed until December 2024. Therefore we will only be able to recognise up to 4 months of benefit from this scheme within the AR25 data tables (row 7_{AR}).

¹³ Southern Water, December 2019. Water Resources Management Plan 2019: Technical Overview. <u>https://www.southernwater.co.uk/media/kuhle5o5/wrmp-2019-technical-overview.pdf</u> With respect to an action plan, the required VSDs and pumps are on-site and ready for commissioning in December 2024. The work will involve connection of equipment by engineers, followed by a pump test to demonstrate increased yields and good water quality (i.e. WRMP scheme completion) before returning the source to supply.

6.2.1.5 Representation of DO improvement schemes in the AR24 data tables

The sections above have provided further information on the Source O, H, C and J schemes. The following points summarise 'where and how' the status of these schemes are represented in the data tables:

- **Source O:** The DO improvements from the WRMP scheme are shown in Table 2 of the AR24 for specific months, but necessary long term outages associated with a separate water quality scheme resulted in a net reduction in DO of 0.7Ml/d within the AR24 data tables (row 7_{AR}) rather than an improvement.
- Source H improvements: The WRMP scheme has led to a reduction in unplanned outage at Source H, relative to levels in 20219-20, 2020-21 and 2021-22. However, we have not recognised a DO benefit of 0.4MI/d within the AR24 data tables (row 7_{AR}) owing to the findings of Pywr modelling completed during AMP7 (that this scheme does not significantly improve the DO). Instead the scheme has improved the resilience of the source.
- **Source J improvements:** The benefits of this scheme were not due to be realised until 2024-25 in the rWRMP19. Therefore cancellation of this scheme had no impact on our AR24 tables. We assume that for AR25 our regulators will require us to report against our recently published Final WRMP24 instead of the rWRMP19. Our Final WRMP24 excludes the benefits of the Source J scheme and the associated 9 MI/d bulk supply to Southern Water.
- Source C improvements: Whilst this scheme is yet to be delivered, the benefits were not due to be realised until 2024-25 in the rWRMP19. Therefore scheme delivery for Source C did not impact the AR24 data tables. We expect to include a 1/4 benefit within our next Annual Review, AR25 based on being available for 3 months of the year and full benefit of 6.5MI/d (DYCP) in the subsequent AR26.

Following completion of the Source O, Source H schemes and the accepted removal of the Source J scheme, we are now focussed on the delivery of the Source C scheme, as demonstrated by the action plan for supply-side scheme delivery.

The next sections provide further information on our AMP7 Source S drought permit scheme and Havant Thicket Winter Storage Reservoir scheme.

6.2.1.6 Drought permit Source S

As described above, the rWRMP19 'final plan' WRZ DO for 2023-24 is 213.49 Ml/d, which incorporates the benefit of the Source S drought permit (3.60 Ml/d) and demand-side drought orders (16.60 Ml/d). This is included within Table 1 of the AR24.

Source S is our drought permit source, which provides benefit in droughts equivalent to, or worse than, a 1- in-125 year event. The nature of the option in our rWRMP19 remains unchanged from our Final WRMP19. However through the preparation of our Drought Plan 2022, and as reported in our rWRMP19, we undertook further work to demonstrate:

- that the source has operated at rates close to those required in the past.
- there is sufficient time to mobilise temporary treatment infrastructure as a drought develops.

The Source S option in our rWRMP19 assumes that very little capital cost is required beyond reinitiating assets that have been underutilised since installation in the 1990s. It also assumes operational costs associated with enhanced human resources and electricity costs in a drought year. The costs would be realised in an emerging drought to ensure that the enhanced DO can be recognised in line with the rWRMP19, Drought Plan 2022 and WRMP24.

To date, and during AMP7, our water resources forecasting has not demonstrated a significant risk of needing our Source S drought option. Therefore we have not fully mobilised to deliver enhanced DO via a drought permit during AMP7. Despite this, we have completed environmental assessment and engineering design work to improve our readiness for permit implementation.

Within the AR24 the scheme is reported as 'on-track' because we are ready to mobilise should our water resources forecasting demonstrate that we are at significant risk of needing a drought permit to maintain the supply demand balance.

6.2.1.7 Havant Thicket Winter Storage Reservoir

In addition to the above schemes, our Regulators letter refers to the delivery of our Havant Thicket Winter Storage Reservoir scheme (benefit 23 Ml/d) being deferred from 2029-30 to 2031-32, with its benefits being available from 2034-35. We can confirm that our WRMP24 assumes the Reservoir scheme will be implemented in 2031-32 and the benefits will be available at the same time. This water is the source of a new 21 Ml/d potable water bulk supply to Southern Water.

It is possible there has been some confusion between this scheme and the separate scheme called the Southern Water Hampshire Water Transfer and Water Recycling Project (HWTWRP) which does rely on the construction of the reservoir, but also requires the construction of water recycling capacity and which plans for 'benefits being available from 2034-35'. This is a Southern Water scheme that will add highly treated recycled water to the Reservoir from 2034-35, for onward transfer to its Otterbourne Water Supply Works (WSW).

6.2.1.8 Risks and mitigation associated with deferring or cancelling schemes

We have provided updates on our rWRMP19 supply schemes above. We fully appreciate that deferring or cancelling schemes can introduce risks to our supply demand balance and the environment, and so we have outlined these risks and the associated mitigation below:

- **Source H improvements:** Whilst this scheme has been completed, we have not recognised an improved DO in line with the findings of our Pywr water resources modelling. This has been mitigated by ensuring the revised assumption for Source H is incorporated within the DO of our WRMP24. Therefore, it will not impact the published WRMP24 starting position or forecast.
- Source J improvements: This improvement targeted improved DO to allow an additional 9 MI/d bulk supply to Southern Water at the end of AMP7. Therefore, the risk of not delivering improved DO is largely associated with Southern Water's WRMP19. As detailed above, Southern Water completed sensitivity testing for its WRMP19 to understand whether alternative schemes were required. Furthermore, the risk has been mitigated by ensuring the revised planning assumptions are incorporated within our WRMP24, Southern Water's WRMP24 and the wider regional plan. Therefore, the cancellation of the Source J scheme and bulk supply will not impact the published WRMP24 starting position.
- Source C improvements: We recognise that delayed delivery of the Source C improvements represents a risk to our 2024-25 supply demand balance and our WRMP24 starting position, in a drought scenario. Our water resources position monitoring and forecasting during 2024-25 demonstrated consistently higher than average groundwater level conditions throughout the summer, which effectively mitigated the risk of delayed delivery having an impact on our ability to supply our customers.

We took this situation into account in August 2024 and decided to prioritise the provision of bulk supplies to Southern Water during September and October, over commissioning the Source C improvements. We have set-out our action plan to ensure delivery of this scheme in time to meet the WRMP24 starting point as we continue our water resource position monitoring and forecasting to anticipate the risk of a drought occurring in 2025-26 (see Table 2).

- Source S drought permit: This scheme is 'on-track' because we are ready to mobilise should our water resources forecasting demonstrate that we are at significant risk of needing a drought permit to maintain the supply demand balance. However, there is a residual risk that, despite mobilisation, the scheme is unable to provide the planned benefit, because we have never experienced a severe drought that required implementation of the scheme. Through our WRMP24 sensitivity testing¹⁴ we explored scenarios where (i) there was no benefit from the Source S drought permit, and (ii) a 50% reduction in the planned benefit. Both scenarios highlighted a vulnerability within our supply side benefit and therefore we included appropriate mitigation with our WRMP24 monitoring plan appendix¹⁵ This includes further development of 'More before 4' options in our next drought plan and liaise with the Environment Agency if our water resources forecasting identifies a significant risk of needing the drought permit in 2025-26.
- **Havant Thicket Reservoir:** Whilst this scheme is delayed relative to the rWRMP19, the risk has been mitigated by ensuring the revised planning assumptions are incorporated within our WRMP24, Southern Water's WRMP24 and the wider regional plan. Therefore, the move from 2029-30 to a 2031-32 implementation year does not impact the published WRMP24 starting position or forecast.

The risk of delayed implementation beyond 2031-32 was explored via sensitivity testing reported in Appendix 9 and Appendix 1C¹⁶ of our Final WRMP24, there were no material impacts on our supply demand balance because of the delays i.e. our WRMP24 is resilient.

6.2.1.9 Action plan for supply-side delivery

The sections above have provided an update on our rWRMP19 supply schemes, addressing the requirements set out within our Defra letter. We have confirmed that our WRMP24 starting position already incorporates the latest planning assumptions for the DO improvement schemes. Our WRMP24 also includes the forecast 2031-32 implementation year for Havant Thicket Reservoir and the associated 21 MI/d bulk supply to Southern Water.

We will continue to report progress on the DO improvement scheme at Source C, which is the final scheme we need to deliver in AMP7. With respect to Source S we will also continue to monitor our water resources position and develop our 'More Before 4' drought plan options to mitigate the potential for reduced yields at Source S in a severe drought. The action plan for supply-side scheme delivery is provided in Table 10.

¹⁴ Final WRMP24 Appendix 9A on sensitivity testing: <u>https://www.portsmouthwater.co.uk/wp-content/uploads/2024/10/9A-</u> <u>fWRMP24-App-Sensitivity-Testing_published_final.pdf</u>

¹⁵ Final WRMP24 Appendix 10A on our monitoring plan: <u>https://www.portsmouthwater.co.uk/wp-</u> content/uploads/2024/10/10A-fWRMP24-App-Monitoring-Plan_published_final.pdf

content/uploads/2024/10/10A-fWRMP24-App-Monitoring-Plan_published_final.pdf ¹⁶ Final WRMP24 Appendix 1C on our common understanding with Southern Water: <u>https://www.portsmouthwater.co.uk/wp-</u> content/uploads/2024/10/1C-fWRMP24-App-SWS-PRT-common_published_final.pdf

Supply-side scheme delivery actions	Target date	status	WRMP24 estimated benefit (MI/d)
Source C: Maintain existing outputs to avoid the risk of supply issues during summer 2023 and to support Southern Water with bulk supplies in autumn 2023.	June to October 2024	Completed	-
Source C: Commission the two new Variable Speed Drives (VSDs) and pumps following the resolution of issues experienced in early 2024.	November 2024	On-going	6.5 (DYCP)
Source C: Test Source C to demonstrate that the WRMP target rate of 28 MI/d can be achieved without water quality issues and put into supply.	December 2024 to March 2025	Planned	Achievement of the full 221.57 WRZ DO for the Final WRMP24 starting position (2025-26)
Source S drought permit : Continue to monitor and forecast our water resources position. If there is a risk of triggering our Drought Plan in 2025-26, begin enhanced engagement with the Environment Agency regarding the Source S drought permit and 'More Before 4' options.	January 2025 to March 2025	On-going	-
Source S drought permit: Further develop the 'More Before 4' options for the next Drought Plan, which will be consulted upon in Autumn 2025	By Autumn 2025	Planned	TBC
Havant Thicket Reservoir: As the construction of the scheme progresses, continue to monitor the forecast implementation year with Southern Water. Ensure that the most up-to-date assumptions are incorporated within the development of the next WRMP.	During AMP8	On-going	No impact on PW WRMP SDB.

Table 10 Action plan for supply-side scheme delivery

7. CONCLUSION AND SUMMARY

On the 11th October 2024 the Department for Environment Food & Rural Affairs (Defra) wrote to us jointly from Defra, the Environment Agency and Ofwat. This letter identified that the Environment Agency and Ofwat have assessed our AR24 and have highlighted concerns with our security of supply, and risk to the environment.

This document provides the information requested by Defra in that letter, and because it forms part of our AR24 we have published it on our website.

The action plans presented within each section of this document are collated below within Table 11 and we will track progress against these, providing updates to our Regulators via 6 monthly meetings.

Dependent upon weather, the actions contained within this plan will close our SDB deficit and for the key metrics of leakage and overall household consumption will put us in line with the starting position for our published WRMP24.

The phased transfer of the 'not for revenue' meters into charge throughout 2025-26, enabled by the publishing of WRMP24, will see our meter penetration figures come into line with our forecast. In response to this, and AMP8 initiatives, we expect to see PCC decrease throughout the period, but not necessarily to levels in line with our forecasts. However as the levels of total household consumption are anticipated to be within forecast, this will not necessarily add pressure to the SDB in its own right.

Supply demand balance delivery actions	Target date	status	WRMP24 estimated benefit (annual average)
Actions towards limiting future DO reduction	ons		
Source G : Complete water quality sampling and bring this source back into supply.	April 2025	On-going	1.52MI/d
Source S : Following the completion of maintenance works, bring this source back into supply for 2025-26.	April 2025	On-going	1.93 MI/d
Source O : Following the completion of a water quality improvement scheme, bring this source back into supply for 2025-26.	April 2025	On-going	2.84 MI/d
Sources I : Continue to explore options to bring this source back into supply.	Early AMP8	On-going	1.41 MI/d
Source D : Lower priority for return to supply. Consider need via drought forecasting.	During AMP8	On-going	0.81 MI/d

Table 11 Action plan for improvement

Actions towards limiting future water losse	s		
System monitoring strategy project: Complete review of our most complex sites.	January 2025	On-going	-
Hydraulic modelling : Full update (100%) of hydraulic models.	January 2026	On-going	-
System monitoring strategy project & hydraulic modelling: Identification of best value options to reduce water losses.	March 2027	On-going	TBC
Actions towards limiting future outage			
Outturn outage for 2024-25 : We are currently forecasting that we will outperform the forecast outage allowance (i.e. on track). Provide an update for the Joint Regulators meeting.	January 2025	On-going	Up to 3 MI/d
Reporting unplanned outage in AMP8 : Discuss with the Environment Agency a pragmatic approach around how to report outage in future annual reviews	March 2025	On-going	
Actions to explore risks to, and availability	of, bulk supplies	5	
Continue to work with Southern Water to explore bulk supply related risks via our next annual review, AR25, and through the development of our next drought plan and WRMP.	2024-25 and during AMP8	On-going	-
Review, with the Environment Agency and Southern Water, how the bulk supplies should be represented within our AR25 and in the calculation of the Supply Demand Balance Index (SDBI)	April 2025	On-going	Potentially > 10 Ml/d

Actions towards reducing leakage			
PALM model activities (2024-25) : Continue with our existing suite of successful activities and overall approach to leakage reduction until the end of 2024-25, with a spot value target of 24 MI/d at the end of the year, representing a 4 MI/d improvement on the 2023-24 annual average value.	March 2025	On-going	4 MI/d
Re-basing leakage: Continue to communicate our progress to Ofwat on our intention to re-base leakage in Year 1.	March 2025	On-going	-
PALM model activities (AMP8): Continue with our AMP8 strategy as outlined in this response document.	During AMP8	-	Annual target In line with WRMP24
Actions towards reducing non-household c	onsumption		
Engagement with non-households: Target the top 1% of water users to collectively reduce their water consumption.	April 2025	On-going	2.85 MI/d
Actions towards reducing Per Capita Consu	Imption (PCC)		
Engagement platform & broadcast communications: Target an additional 900 registrations by the end of this reporting year	End of March 2025	On-going	15.1//h/d for participating households
Smart meter trials : Install 500 meters, install 100 flow control devices, engage with customers, and where identified, incentivise the repair of leaks.	End of March 2025	On-going	Between 15 and 30 I/h/d for participating households
Home visits: Complete 1,000 water efficiency home visits	End of March 2025	On-going	60l per day for participating households
Future PCC reductions (AMP8): Deliver our water efficiency strategy as set out in our Final WRMP24.	During AMP8	-	Annual target In line with WRMP24

Actions towards increasing metering			
COO, Optant and void metering: Continue with our metering programme to achieve at least 4,341 'in-charge' meter installs during 2024-25.	End of March 2025	On-going	+ 1.2 % meter penetration
COO, Optant and void metering: Continue sharing the water scarcity message on our social media platforms and direct customers to our water efficiency page, where they can opt in for a meter.	End of March 2025	On-going	-
Not-for-revenue meter conversion: Move 20,000 meters into our CRM system	End of March 2025	-	-
Not-for-revenue meter conversion: Initiate customer communications and begin reading the meters depending on where they fall in the 6 monthly read routes.	From April 2025	-	
Not-for-revenue meter conversion: Transition 20,000 customers to metered charges by June 2026	By June 2026	-	+ 3.9 % meter penetration
Actions towards supply scheme delivery			
Source C: Maintain existing outputs owing to the avoid the risk of supply issues during summer 2023 and to support Southern Water with bulk supplies in autumn 2023.	June to October 2024	Completed	-
Source C: Commission two new Variable Speed Drives (VSDs) and pumps following the resolution of issues experienced in early 2024.	November 2024	On-going	6.5 (DYCP)

Source C: Test Source C to demonstrate that the WRMP target rate of 28 MI/d can be achieved without water quality issues and put into supply.	December 2024 to March 2025	Planned	Achievement of the full 221.57 MI/d WRZ DO for the Final WRMP24 starting position (2025-26)
Source S drought permit: Continue to monitor and forecast our water resources permission. If there is a risk of triggering our Drought Plan in 2025-26, begin enhanced engagement with the Environment Agency regarding the Source S drought permit and 'More Before 4' options.	January 2025 to March 2025	On-going	-
Source S drought permit: Further develop the 'More Before 4' options for the next Drought Plan, which will be consulted upon in Autumn 2025	By Autumn 2025	Planned	ТВС
Havant Thicket Reservoir: As the construction of the scheme progresses, continue to monitor the forecast implementation year with Southern Water. Ensure that the most up-to-date assumptions are incorporated within the development of the next WRMP.	During AMP8	On-going	0



APPENDIX A: OUR RESPONSE TO THE ENVIRONMENT AGENCY AR24 LETTER





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Please ask for: Liz Newall-Smith Reference: AR24

WRMP19: Annual Review 2024 - RESPONSE TO ENVIRONMENT AGENCY LETTER

Thank you for your letter dated 9th September 2024 in which you have shared your findings from your audit of our Annual Review for the year 2023-24 against our latest published WRMP19 (rWRMP19 Dec 2022).

We responded to your letter on 3rd October 2024, stating that we would provide you with further information relating to our outages and to our non-household consumption by the 1st November 2024. Please see our response below to the improvements that you have identified and the recommended actions for us to take.

In summary, this letter provides details on:

Outage

- Our estimated outage for 2024-25 and a first view of our AMP8 Planned Outage programme.
- The possible AMP8 programme impact and mitigation on our supply demand balance (SDB).
- An explanation of our Source O representation within the Annual Review 2024.

Non-Household Consumption

- Our 2024-25 action plan to influence NHH consumption to bring it in line with our WRMP target.
- A summary of our AMP8 Non-Household water efficiency programme.

The information provided in this response does not present any required changes to the reported SDB or narrative in the Annual Review.

IMPROVEMENT AND RECOMMENDATION ACTION 1- OUTAGE

Improvement	Recommendation
"Reported outage of 8.93 Ml/d is significantly above (33.3 %) the WRMP19 allowance of 6.70 Ml/d. This reported outage is split between unplanned (4.12 Ml/d) and planned outage (4.81 Ml/d). Your high level of outage is posing a risk to the environment and to security of supply. Your Annual Review narrative sets out that you have taken the opportunity to carry out additional planned outage due to the wetter than average conditions of the reporting year. Whilst we understand the reasons for this, high outage (both planned and unplanned) is contributing to the significant SDB deficit and increasing the security of supply risk to customers."	"Portsmouth Water should provide the Environment Agency with an action plan on how you intend to address bringing outage in line with your WRMP19 outage allowance and minimise the impact of outage on your SDB."

As stated in your letter, during 2023-24, we experienced total outage of 8.93 Ml/d¹, with planned outage being 4.81Ml/d and unplanned being 4.12Ml/d.

The planned outage was due to our capital maintenance programme which included contact tank maintenance at Site A, and well head improvements at Site F.

The unplanned outage came from unexpected events - primarily caused from water ingress at sites H, Q and R due to the prolonged very high groundwater levels. The remaining unplanned outage can be attributed to various short-term reasons including contamination, communication loss, low chlorine levels, high velocity flushing, dosing issues and UV quarantine valve issues.

The WRMP target of 6.7 Ml/d is the outage allowance in a **dry year**. Our outturn outage in 2023-24 was what we experienced during a **wet year**. Despite this, if our WRMP forecast is not met by our outturn outage, it will contribute negatively towards our SDB in the Annual Review.

Within the Annual Review, we presented a 'dry year uplift' outturn value whereby we removed the unplanned outage events that were associated with wet weather conditions (e.g. high groundwater levels) to more accurately represent what we would have experienced if the year had been a dry year. This resulted in an outage value of 6.46 Ml/d which is **below our WRMP target**.

Furthermore, planned outage would not have occurred during the critical period in a 1:200 year drought, as our planning processes would not allow us to take sources out of supply when demand for water is at its highest in the summer. However, we have still included the planned outage within the annual average 'dry year uplift' value of 6.46 Ml/d as we would have potentially still carried out the work at a different time of the year.

We therefore believe that our 'dry year uplift' outage values are those that should be compared to the WRMP forecasts for a fairer comparison, and that we were within our forecast outage allowance for 2023-24.

¹ All values reported within this letter are representative of Annual Average values. For Critical Period please see the Annual Review 2024.

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However, we acknowledge your underlying concerns for the risk you perceive in making these comments, and so we have critically reviewed our planned outage schedule for 2024-25. We would also like to take this opportunity to look further ahead and provide a first view of our outage planning for our ambitious AMP8 investment programme. We would like to have open and transparent discussions with the Environment Agency going forwards to ensure we develop a pragmatic joint approach to reporting our outage in future Annual Reviews.

The estimate of 2024-25 outage

We have estimated our outturn outage for our Annual Review 2025, which is broken down in Figure 1 below. The figure shows that our estimated outage (planned and unplanned) based on our current levels of understanding and with just under half a year remaining, for 2024-25 is projected to be 4.51Ml/d.

Planned outage 2024-25	WRMP24 AA DO (MI/d)	Number of days outage	DO impact (MI/d)
Site M	3.85	56	0.59
Site C	16.53	8	0.36
Site A	20.49	28	1.57
Site F	7.20	26	0.51
Total 2024-25 Planned Outage			3.04
Unplanned outage YTD (ie 6	WRMP24 AA DO	Number of	DO impact (MI/4)
Site O	(IVII/O)	udys outage	DO Impact (IVII/d)
Site Q	0.74	1	0.02
Site R	10.00	2	0.05
Site M	3.85	1	0.01
Site P	8.01	1	0.02
Site A	20.49	5	0.28
Site K	9.13	10	0.25
Site J	8.42	10	0.09
Total 6 monthly Unplanned Outage			0.73
Total 2024-25 Estimated Unplanne	d Outage (6 month	x2)	1.47
Planned	3.04		
Unplanned	1.47		
Total estimated Outage 2024-25	4.51		

This is below the WRMP target of 6.7 Ml/d, but is of course subject to change.

Figure 1: Estimated Planned and Unplanned Outage for 2024-25

The planned outage comes from our remaining capital maintenance programme for this year. We are not anticipating any dry weather events for the rest of the year and so this is likely to be an accurate estimate.

The unplanned outage experienced in the first six months of the year is the result of various short-term issues such as feed tank issues, pump faults, sensor failures and turbidity. We have taken the estimated value for the last 6 months and doubled it to provide a full year estimate.

The numbers in this table are supplied as illustrative figures only and cannot be considered as final outturn values until they have been formally verified and audited.

We will provide an update on the outage experienced to date for the Joint Regulators meeting in January 2025.

AMP8 Outage Programme

We are currently in the process of developing a comprehensive outage program for AMP8, which is mostly driven by our ambitious asset maintenance and water quality standard commitments. The plan will require us to efficiently carry out Capital Maintenance, Enhancement, Refurbishment and Reinforcement schemes at thirteen of our twenty-one sites within the AMP. The work will require some level of shutdown at each of these sites over the course of the AMP.

Detailed planning work is underway and at this point it has been assumed that the majority of shutdowns will last from 0.5 to 3 months and will be sequenced in a logical order to minimise disruption to our security of supply during business-as-usual operations. Each site works will be allocated a dedicated Project Manager who will review the assumptions and further refine the programme. This could result in the shutdowns being shorter or longer than currently assumed.

The long-term benefits of this programme will be an increase in the operational resilience of our sites, leading to a reduction in unplanned outage going forwards. This will provide an improvement to our outage levels against WRMP forecasts.

Appendix A provides a high-level overview of the AMP8 programme as it is understood now, highlighting only the periods of shutdown/outage rather than the full detailed programme. This provides a first look at the programme but as discussed, this is a work in progress draft and is subject to change. We aim to have an initial draft plan by January 2025 and will present this during our Joint Regulators meeting.

Figure 2 below shows an example of how the AMP8 planned outage events would translate into Deployable Output impacts in terms of Annual Review reporting against the WRMP24, based on the first look of the programme.

Two sites have been removed from this graph – Sites I and H. The Site I programme is currently due for completion in the first quarter of AMP8 of Year 1. However, as it will have been part of an outage event > 6 months, it will be accounted for as a reduction of DO in the Annual Review, rather than an outage. Similarly, Site H has a planned shutdown > 6 months in AMP8 Year 3 and it is anticipated that it will also be represented as a reduction in DO at this point in time.

The final programme will look different to that shared below, but we will use the same process/methodology to assess the impacts on Deployable Output for each site and ensure decisions to proceed with discretional work will be made with supply security in mind.



Figure 2: Illustrative Planned Outage Values over AMP8

The graph shows how the AMP8 planned outage programme would translate into outturn planned outage for each of the five years. The WRMP24 outage allowance of 6.7 Ml/d in this instance might be exceeded in Years 2 and 5, if the nascent conditions are favorable to allow the programme to proceed.

Possible programme Impact and mitigation on our AMP8 Supply Demand Balance (SDB)

The AMP8 programme of works is necessary to ensure water quality treatment standards and site reliability are improved to continue to supply our high levels of service to our customers and continue to protect the environment. We will put in place processes which will ensure that this essential work will not negatively impact on our SDB during vulnerable periods. We will monitor progression of the plan and ensure that we do not carry out any works if the outage event could potentially cause an unacceptable negative impact to customers and/or the environment.

Prior to a shutdown taking place there will be a documented Go/No-Go decision point which will involve (but not limited to) the following assessments:

- Resilience impacts on the system we are working on a way to subjectively assess this.
- Potential impacts on Southern Water bulk supplies ensuring that our commitments can still be maintained.
- Weather forecast / drought predictor to understand whether the site will be needed to maintain supply.
- Environmental considerations such as WFD No-Deterioration this will highlight whether the outage will put increased pressure on other sources. We would take into consideration the WFD No Deterioration thresholds (2010-2015 annual average abstraction) within our production planning and if possible, adjust our programme of maintenance works to mitigate WFD No Deterioration risks. There is more information on monitoring this risk within the WRMP24 Appendix 10a "Adaptive Pathway Monitoring Plan".

We believe that this forward thinking around the AMP8 programme will ensure it will not negatively impact our WRMP supply demand balance.

We will discuss with the Environment Agency a pragmatic approach around how to report our upcoming outage within our Annual Review and will provide regular updates on the outage programme through our regular Environment Agency meetings and six-monthly Joint Regulator meetings.

IMPROVEMENT AND RECOMMENDATION ACTION 2 - SOURCE O OUTAGE

Improvement	Recommendation
"Source O outage is not over a consecutive six-month	"Portsmouth water should discuss with the
period but has been reported as a loss of Deployable	Environment Agency if the Deployable Output
Output. We consider it is possible that this is more	reductions at Source O should have occurred, and
appropriate to include in your outage experienced	following this discussion, confirm what impact
because it is two separate activities."	reporting the event as outage would have on the SDB."

Source O was reported within the Annual Review 2024 as being offline for two significant periods. The first was at the start of the year (April to July inclusive), and the second from January to March inclusive.

The first event was because of a positive cryptosporidium detection, identified on 1st January 2023. The site was removed from service as per the Company's policy. Genotyping results from the positive detection reported 'Cryptosporidium suis' which is commonly found in pre-weaned pigs, providing evidence of the source of the cryptosporidium being from the nearby pig farm.

The site remained offline whilst capital solutions, comprising an amazon filter system, were designed and installed. The site returned to service utilising the filter system between the end of July 2023 and 4th January 2024. The site was taken out of service for a second time to allow a permanent UV plant to be installed. The site is currently still offline while the final commissioning of the site is completed.

As explained in the Annual Review narrative, "although the site was not offline for 6 consecutive months in the year, the four months at each end of the year were part of longer duration events which were above six months. These events are therefore accounted for as DO reductions rather than outage."

This aligns with the Water Resources Planning guideline which states that any event over 6 months duration should be a reduction in Deployable Output. The whole event needs to be considered rather than the portion sitting within the reporting year. We therefore believe that we have represented the longer period outage events at Source O in the correct way.

Even if the events were considered as outage rather than DO reduction, there would be no impact on the reported SDB in our report, as it would simply be the reallocation of the contribution from Source O - resulting in a higher outturn DO, offset by a higher outturn outage of the same magnitude.

IMPROVEMENT AND RECOMMENDATION ACTION 3 - DISTRIBUTION INPUT

Improvement	Recommendation
"Your reported Distribution Input (DI) of 177.9 Ml/d is 2% above your WRMP19 forecast of 174.15 Ml/d. DI is above forecast for the fourth consecutive year. Previous performance has seen a fluctuating trend for reported DI which is attributed to your above forecast total leakage, average household PCC and non-household consumption. Linked to the above point, we are concerned that high DI is contributing to a risk to the security of supplies and may also increase the amount of water taken from sensitive environments through abstraction."	"The actions to undertake for total leakage and average household PCC will be included in your Joint Regulator's Letter."

We have received the Joint Regulators Letter from Defra and will respond accordingly and directly to that letter by the deadline of 29th November 2024.

IMPROVEMENT AND RECOMMENDATION ACTION 4 - NON-HOUSEHOLD CONSUMPTION

Improvement	Recommendation
"Your reported unmeasured non-household consumption of 0.59 Ml/d is 11% above the WRMP19 forecast of 0.53 Ml/d. Unmeasured non-household consumption is above your WRMP19 forecast for the fourth consecutive year. Your reported measured non- household consumption of 32.03 Ml/d is 1.97% above the WRMP19 forecast of 31.41 Ml/d. Whilst you were below forecast for the first two years of AMP7, performance has seen measured non-household consumption increase above WRMP19 forecast since 2022/23. Based on annual performance, you are not on track to meet your measured non-household consumption WRMP24 forecast of 29.18 Ml/d at the start of the planning period. You need to reduce measured non-household consumption by at least 2.85 Ml/d to achieve your WRMP24 starting point."	"For non-household consumption specific actions, Portsmouth Water should provide the Environment Agency with an action plan, including specific actions and timelines, to reduce non-household consumption. The action plan should include the expected Ml/d benefit from each action and how actions are going to be monitored and reported. Portsmouth Water should provide an update on progress with delivery of the action plan at the regular technical meetings throughout the year and in your next Annual Review submission."

Total Non-Household Consumption

Figure 3 below shows how our Total Non-Household (NHH) consumption has varied since 2015-16 and how the recent outturn years have compared against our WRMP19 and WRMP24 NHH forecasts. There was a significant reduction in NHH consumption in 2020-21 due to the Covid-19 pandemic. Since then, NHH consumption has slowly increased up to 2023-24.



Figure 3: Non-Household Consumption against WRMP Forecasts

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A study led by Artesia into 'Water use shock event effects and regulatory treatment' indicated that the cost of living (including high energy costs) has suppressed **household** per capita consumption (PCC). The same study also found a small increase in non-household consumption, implying some level of reallocation of household use to non-household use. Our current view is that the cost of living elevated the 2022-23 non-household demand above forecast levels where it has remained for 2023-24².

When comparing our most recent outturn total NHH consumption value of 32.62 Ml/d to our WRMP19 forecast for 2023-24, there is a difference of only 0.68 Ml/d. However, as we look towards implementing our WRMP24, we are targeting a reduction in total NHH consumption to 29.79 Ml/d within the 2024-25 reporting period. To reach this target will require a total annual average NHH consumption reduction of 2.83 Ml/d by April 2025.

If we break this down into the 'measured' and 'unmeasured' components of NHH consumption, the Table 1 shows that we specifically need to focus our attention on **reducing measured NHH consumption by at least 2.85 Ml/d** to achieve our WRMP24 targets in 2024-25.

	Measured NHH	Unmeasured NHH
	consumption	Consumption
Current outturn (2023-24)	32.03	0.59
WRMP24 target (2024-25)	29.18	0.61
Difference (Ml/d)	-2.85	+0.02

Table 1: Measured and Unmeasured Non-Household Outturn Consumption against WRMP24 Targets

Measured Non-Household assessment

As a company, we supply a total of 13,495 NHH properties. 11,948 (86%) of these are measured and they accounted for 32.03 Ml/d of consumption in 2023-24. Out of these measured NHH properties, the top 10% of water users (numbering 124 businesses) account for 81% of consumption. Breaking this down further, the top 1% of water users account for 46% of the total measured NHH consumption - which equates to 14.7 Ml/d.

We are aiming to **target the top 1% of water users** to collectively reduce their water consumption by 2.85 Ml/d - from **14.7 Ml/d to a spot value of 11.85 Ml/d** (a reduction of approximately 20%) by April 2025. This would put us in a good position to deliver on the WRMP24 within year 1 of AMP8, when our universal smart metering programme commences for NHH users of water.

Action Plan for 2024-25

Figure 4 shows our action plan which is further explained below. Work has already commenced on the data collection and we are expecting to report results within the Annual Review 2025.

² For further explanation of household and non-household consumption patterns, and derivation of WRMP forecasts, please see the Statement of Response submitted to Defra in April 2024 <u>https://www.portsmouthwater.co.uk/wp-content/uploads/2024/04/PRT-WRMP24-Defra-Letter-Response_final.pdf</u>



Figure 4: Non-Household Consumption - Action Plan for 2024-25

We are already in the process of using our systems to identify which businesses in our top 1% of water users have an existing logged meter (for the purposes of accurately calculating the water balance).

For each of these logged users we are able to obtain consumption data measured every 15 minutes, which can be visualised in a graph similar to that below.

The illustration (an anonymised real-life consumption record) shows two of the trends we will be looking for: the trend of base flow (i.e. the minimum flow) from the site which is otherwise known as the 'nightline' and the volume of water used 24/7 on a site. Both could be possible indicators of leakage or unintentional water loss or could indicate a 24hr operation taking place on the site.



Figure 5: Illustrative example of a Non-Household water users flow

Where we identify that a business has a continuous nightline, as in this example, then we will engage with the business via their Water Retailer to seek to understand if this is genuine operational use or unintentional water

loss. The communications will include an indication of how much this continuous water usage is costing the business (water and wastewater charge) and we will encourage that business to investigate the reasons behind the use.

Findings may be that the continuous nightline is a requirement of the business and is genuine water use. However if not, then it may be that they are experiencing a leak or other form of water wastage, which in some instances is increasing over time. In the case of the latter scenario, we will provide support and recommend actions to maximise water efficiency at the site.

Subsequent consumption will be monitored over the following three months to identify whether our engagement has been effective in terms of water use. Follow up communication will provide opportunities to assess effectiveness and understand any further requirements and necessary support.

Non-Household Water Efficiency: Premier Inn Case Study

We are confident that there is an opportunity through engagement with NHH water users of following previous work we have undertaken in the sector.

Following the success of the North Harbour project³ in 2023-24, we have also supported a further initiative with Whitbread owned Premier Inns.

In January 2024 our delivery partner, H2Oiq, undertook a water saving project with all 12 Premier Inn hotels in our supply area having been challenged to maximise water efficiency at those premises. They did this through a mixture of reactive means, finding and fixing existing leaks on sanitary ware, and proactive means, through installing aerated flow restrictors on taps, installing water efficient shower heads, as well as installing new air gap valves in the toilet cisterns in all 890 rooms over the 12 hotels.

Below is an illustration from one of the post project reports showing the verified headline savings across a single site in terms of water, carbon and financial impacts.

The illustration also seeks to differentiate the difference in water usage/saving between each of the most common water uses.



Figure 6: Illustration of water savings at one of the Premier Inn water efficiency initiative sites

³ More information on this can be found in the Annual Review 2024 <u>https://www.portsmouthwater.co.uk/wp-content/uploads/2024/07/Portsmouth-Water-WRMP-Annual-Review-2024.pdf</u>

The combined annual water use of these hotels was calculated at 62,618 m3 (0.17 Ml/d) with an estimated minimum saving of **28%** reduction in water use once the installations were completed. This takes their combined annual water use down to 45,085 m3 (0.12 Ml/d).

AMP 8 Non-Household Action Plan

Once our WRMP24 is implemented in AMP8, we will be able to fully progress with our smart metering roll out which includes non-household (NHH) dedicated water efficiency support to retailers and NHH customers.

Our AMP8 Non-Household (NHH) action plan has recently been published as part of our WRMP24 - Appendix 10B "Water Efficiency Strategy"⁴ and describes how we plan to reduce NHH demand by at least 15% by 2050 (from a 2019/20 demand baseline).

Table 2 below is taken from Appendix 10B and shows the cumulative benefits of smart metering in WRMP24 (existing dumb metered NHH).

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036+
MI/d	0.37	1.50	2.51	2.97	3.42	3.49	3.56	3.63	3.68	3.68	3.68

 Table 2: Cumulative MI/d Benefits of Smart Metering Non-Household premises as forecast in WRMP24

In addition to the benefits of smart metering, the follow up audits would provide cumulative benefits as shown in Table 3.

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
MI/d	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03

Table 3: Cumulative MI/d Benefits of follow up audits on Non-Household premises as forecast in WRMP24

We are already seeing a rise in water resource awareness from many NHH customers and believe that they will become more efficient through their own efforts, especially when given greater visibility of their usage by the data collect through smart metering and the greater financial benefits afforded by the high-energy prices. In addition to this, we are committing to the delivery of our AMP8 action plan to encourage further NHH reductions. Key activities include:

- Tailored advice and support which will be greatly enabled with smart metering.
- Online engagement platforms for small (SME) NHH water users (akin to GetWaterFit) if a similar option is not already provided by their own retailer.
- At least 20 water efficiency NHH visits each year with a focus on the top 10% of highest users, alongside leak detection advice.
- At least 20 school visits each year to carry out water efficiency checks and include complimentary educational materials for teachers to encourage engagement and understand around water use with children.
- Continued engagement with the agricultural industry through our existing catchment initiatives, to reduce

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⁴ <u>https://www.portsmouthwater.co.uk/wp-content/uploads/2024/10/10B-fWRMP24-App-Water-Eff-</u> <u>Strategy_published_final.pdf</u>

agricultural demand.

We will monitor the progress of these plans going forwards and will include a progress report and quantify the reductions achieved as a result in the WRMP monitoring plan and the Annual Review process.

In conclusion, we trust that this letter provides assurance that we are continually working hard towards our WRMP targets and we look forward to continuing to work closely together to progress these actions as we implement our new WRMP24 into AMP8.

Yours Sincerely,

Liz Newall-Smith C.WEM, CSCI, CENV | Water Resources Manager

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Appendix A

AMP8 Planned Outage programme (showing only the periods of shutdown)

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Westergate	3																																																			
Slindon	2																																																			
Aldingbourne	2																																																			
Lavant	2																																																			
Fishbourne (50% output)	0.5																																																			
Northbrook	3																																																			
Itchen	4.2																																																			
Lovedean	4.3																																																			
Worlds End	1																																																			
Soberton	1																																																			
Walderton	1.5																																																			
Havant & Bedhampton	3																																																			

NB: There are two longer term outage events (> 6 months) which have been excluded from this chart as they would be counted as DO reduction rather than outage, in accordance with the Annual Review reporting guidelines.


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