# WSX14 – Water networks plus strategy and investment

Business plan
2025-2030

Wessex Water
YTL GROUP

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# WSX14 – Water networks plus strategy and investment

## CONTENTS



*This supporting document is part of Wessex Water's business plan for 2025-2030.*

*Please see 'WSX00 – Navigation document' for where this document sits within our business plan submission.*

*More information can be found at wessexwater.co.uk.*

**For annexes, see supporting documents:**

**WSX15 section A1 – PR24 drinking water quality submission to the DWI**
**WSX15 section A2 - Demand Management Strategy**
**WSX15 section A3 – M&G Enhancement**
**WSX15 section A4 - Innovation**
**WSX61 – WRMP summary and related links**

# Executive summary

## Safe & reliable water supply

Our ambition ‘To provide reliable, affordable services for all customers and communities’ will be achieved by delivering several outcomes including ‘Safe and reliable water supply’ and ‘Sustainable abstraction’ and ‘Excellent customer experience’ and ‘affordable bills’.

We face several challenges in delivering these outcomes, with the impact of climate change potentially having the greatest impact over the longer term. In the medium term the forecast supply demand balance deficit from abstraction licence reductions in the Hampshire Avon catchment present the most pressing issue requiring action now. We need to focus on resilience within our system to be able to continue to deliver a safe and reliable water supply, irrespective of the environmental challenges. In developing our programme for the period of 2025 to 2030 and beyond, we have aimed to:

- develop an ambitious business plan that delivers for customers
- adopt a progressive approach incorporating cultural improvements, working practices and innovation
- build on our leading performance
- take a long-term view to ensure a resilient supply network and future proofed projects.

Our strategy and investment plan can be broken down into the two expenditure categories as shown below.

### Enhancement

Our plan includes enhancement expenditure in the following key areas:

- Nitrate treatment
- Lead pipe replacement
- Leakage reduction
- Smart metering
- Water efficiency
- Security – Cyber
- Laboratory enhancement for PFAS

In response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods we have scaled back our proposed leakage reduction and smart metering programmes from our revised WRMP. Our forecast leakage reduction in AMP8 has reduced from 7.7Ml/d to 3.5Ml/d, and our smart metering target from 75% of properties (HH & NHH) smart metered by 2030 to 40%. We plan to return to the glide path for the 50% leakage reduction and 110l/h/d PCC by 2050 in AMP9. This will require further significant enhancement funding in AMP9.

### Maintenance

Our maintenance plan includes an uplift in maintenance expenditure in the following key areas:

- Trunk mains replacement for ATO and DWI Reg 28 on BBO
- Distribution mains replacement for long term asset stewardship (as measured by mains repairs PC)
- Disinfection improvements
- Improving the resilience at our largest WTW ✂

# 1. Introduction

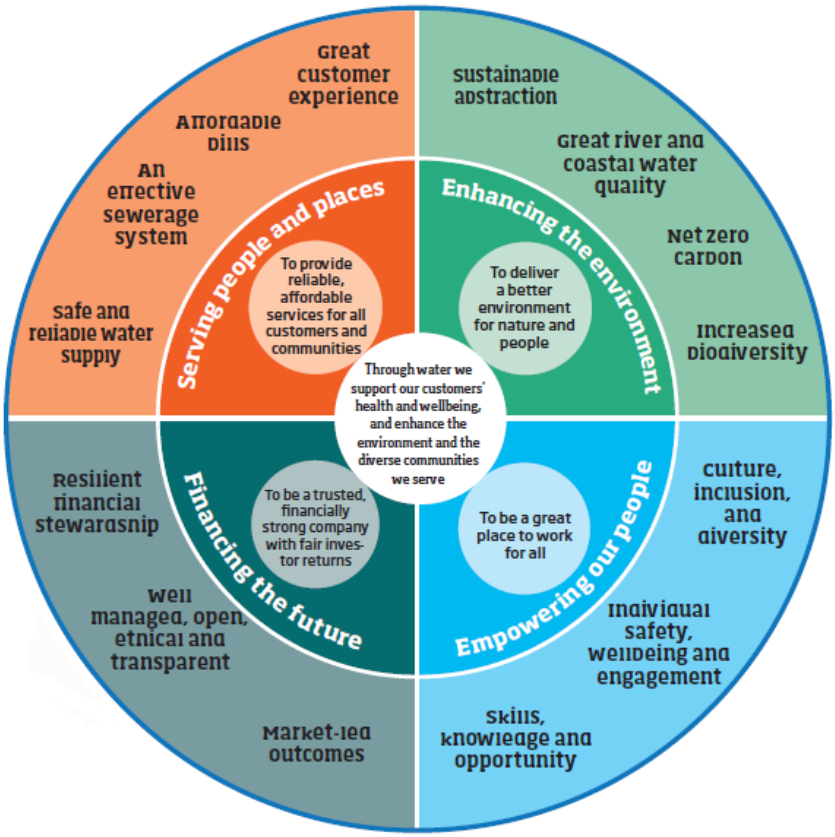
## 1.1. Strategic Direction Statement

Our purpose is '*To support our customers' health and wellbeing, and enhance the environment and the diverse communities we serve*'. As an essential services business rooted in our region, we have a responsibility to do what we can, in partnership with others, to address shared societal challenges of unprecedented scale and urgency – the climate and nature emergencies, the need for carbon neutrality, rising public expectations of the environment, higher living costs and long-term resilience.

In March 2022 we published our strategic direction statement entitled *Water – a new direction* which sets out exactly how we intend to stretch ourselves over the coming 25 years. It describes our long-term vision and ambition around the role we will play in delivering the outcomes that customers, communities, and stakeholders expect of us, through to 2050.

*Water – a new direction*[1] looks at delivering long term outcomes, as opposed to traditional short-term outputs, and presents the following wheel (Figure 1) to summarise our 25 year plan.

*Figure 1 – Wheel summarising 25 year plan*

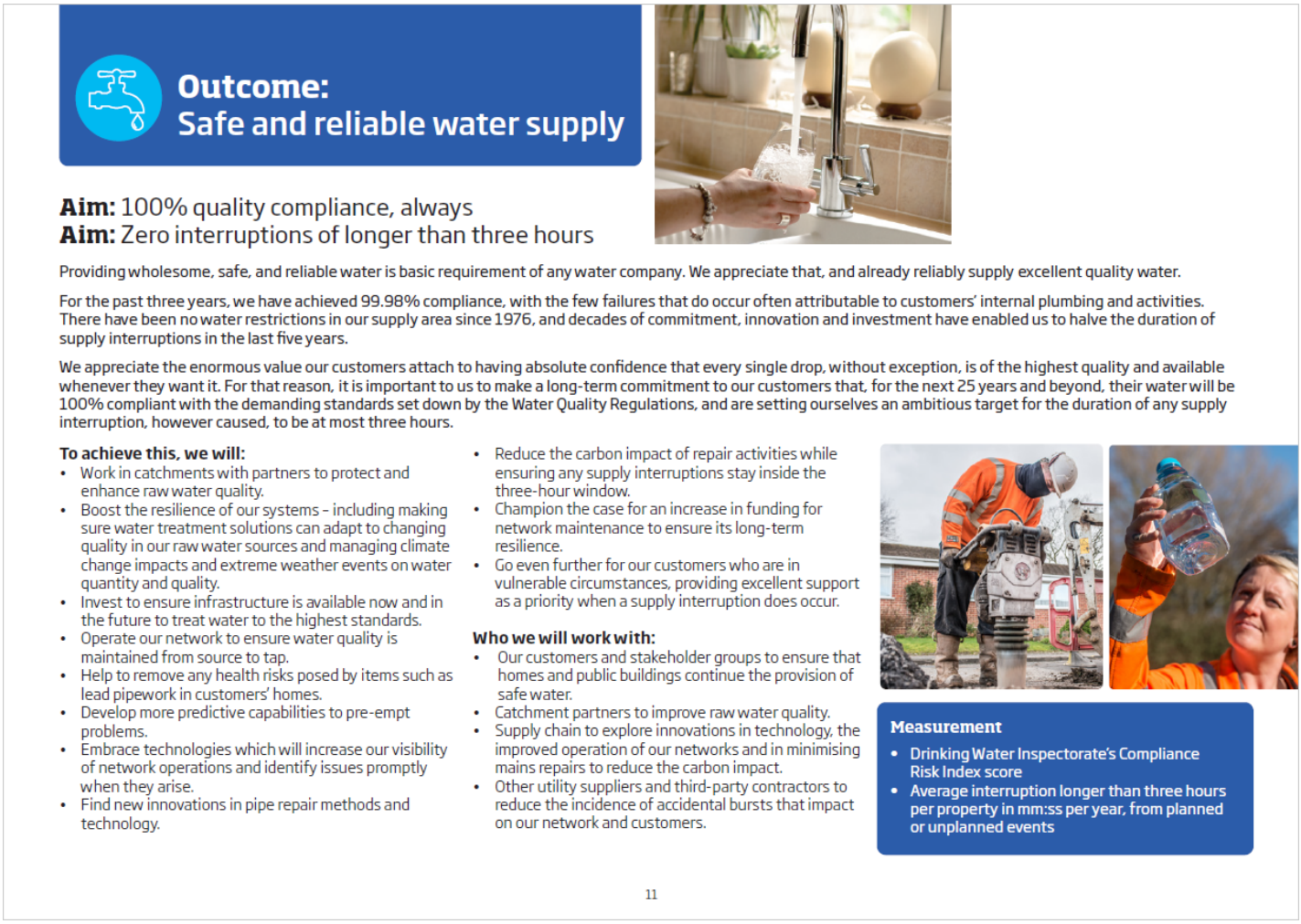



[1] wessex-water-strategic-direction-statement-2022.pdf (wessexwater.co.uk)

At the heart of our SDS are eight outcomes, all co-created with stakeholders, all focused on long-term ambition. They cover customer, community and environmental outcomes and are shown in the top half of this wheel that summarises our 25-year plan. We have also identified some enablers, involving internal and wider supply chain partnerships, that we will need to secure to effectively deliver our eight outcomes, centred around strong financing and governance, and empowered people. These are shown in the bottom half of the wheel.

The extract below (Figure 2) describes how we intend on delivering the outcome 'Safe and reliable water supply' as part of the overall ambition 'To provide reliable, affordable services for all customers and communities'.

*Figure 2 – Extract from Water - a new direction - Outcome: Safe and reliable water supply*[1]



**Outcome:**
**Safe and reliable water supply**



**Aim:** 100% quality compliance, always
**Aim:** Zero interruptions of longer than three hours

Providing wholesome, safe, and reliable water is basic requirement of any water company. We appreciate that, and already reliably supply excellent quality water.

For the past three years, we have achieved 99.98% compliance, with the few failures that do occur often attributable to customers' internal plumbing and activities. There have been no water restrictions in our supply area since 1976, and decades of commitment, innovation and investment have enabled us to halve the duration of supply interruptions in the last five years.

We appreciate the enormous value our customers attach to having absolute confidence that every single drop, without exception, is of the highest quality and available whenever they want it. For that reason, it is important to us to make a long-term commitment to our customers that, for the next 25 years and beyond, their water will be 100% compliant with the demanding standards set down by the Water Quality Regulations, and are setting ourselves an ambitious target for the duration of any supply interruption, however caused, to be at most three hours.

**To achieve this, we will:**
- Work in catchments with partners to protect and enhance raw water quality.
- Boost the resilience of our systems - including making sure water treatment solutions can adapt to changing quality in our raw water sources and managing climate change impacts and extreme weather events on water quantity and quality.
- Invest to ensure infrastructure is available now and in the future to treat water to the highest standards.
- Operate our network to ensure water quality is maintained from source to tap.
- Help to remove any health risks posed by items such as lead pipework in customers' homes.
- Develop more predictive capabilities to pre-empt problems.
- Embrace technologies which will increase our visibility of network operations and identify issues promptly when they arise.
- Find new innovations in pipe repair methods and technology.
- Reduce the carbon impact of repair activities while ensuring any supply interruptions stay inside the three-hour window.
- Champion the case for an increase in funding for network maintenance to ensure its long-term resilience.
- Go even further for our customers who are in vulnerable circumstances, providing excellent support as a priority when a supply interruption does occur.

**Who we will work with:**
- Our customers and stakeholder groups to ensure that homes and public buildings continue the provision of safe water.
- Catchment partners to improve raw water quality.
- Supply chain to explore innovations in technology, the improved operation of our networks and in minimising mains repairs to reduce the carbon impact.
- Other utility suppliers and third-party contractors to reduce the incidence of accidental bursts that impact on our network and customers.





**Measurement**
- Drinking Water Inspectorate's Compliance Risk Index score
- Average interruption longer than three hours per property in mm:ss per year, from planned or unplanned events

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Our SDS provides similar details on our 'Sustainable abstraction' and 'Excellent customer experience' and 'affordable bills' outcomes.

## 1.2. Principles of Approach

Our approach to long term planning and identifying investment uses a combination of the following:

- priorities set out in Water – a new direction (our 25 year vision)
- strategies set out in our updated Water Resources Management Plan
- strategies to achieve challenging Performance commitments
- managing risks in our Drinking Water Safety Plans (DWSP) and improving resilience

- horizon scanning of future obligations and trends such as modelling long-term water quality
- our Asset Management Framework, based on best practice, including our ongoing programme of strategic and minor capital maintenance
- review of people and systems.

As part of our internal governance process for the business plan, the outcomes from these methodologies have been tested through a series of internal risk and challenge meetings ahead of inclusion in our plan.

### 1.2.1. Risk management

The identification and management of risk is delivered through a tiered system of groups drawn from operational staff, management, Executive Directors, and the Board. The Board reviews and holds ultimate responsibility for the risk process, supported by the Audit and Risk Committee.

Asset and operational risks are reviewed, assessed and recorded continuously by staff as part of our Drinking Water Safety Plan (DWSP) programme, as a result of regular reviews and in response to changes. Risks are scored using an externally accredited process which assesses probability and impact on a five-by-five matrix. Risk mitigation plans are recorded and implemented where appropriate and pre and post mitigation scores are recorded.

The risks identified provide a foundation for the risk hierarchy identifying more substantial tactical risks and a line of sight to the corporate risk register (to which our DWSP process feeds into). The corporate risk register is maintained by senior managers from across the business who are experts in their respective fields. Oversight of this process is by our Risk Management Group (RMG) that review all business risks, including emerging and strategic risks. Where a risk is deemed out of tolerance, RMG will consider additional measures to reduce it to an acceptable level or escalate the risk as appropriate to the Executive Leadership Team (ELT) or the Board.

RMG meets through the year and submits an update on the strategic and principal risks to the ELT and the Board twice a year. Any significant new risks are reported to the monthly ELT meetings.

ELT scrutinises and challenges the risks and request additional work where necessary to better classify the risk or explore alternative mitigation methods.

In 2023 we are introducing a new corporate risk system which will integrate all of our company risk records and assurance activities, as represented in the Figure 3 below.

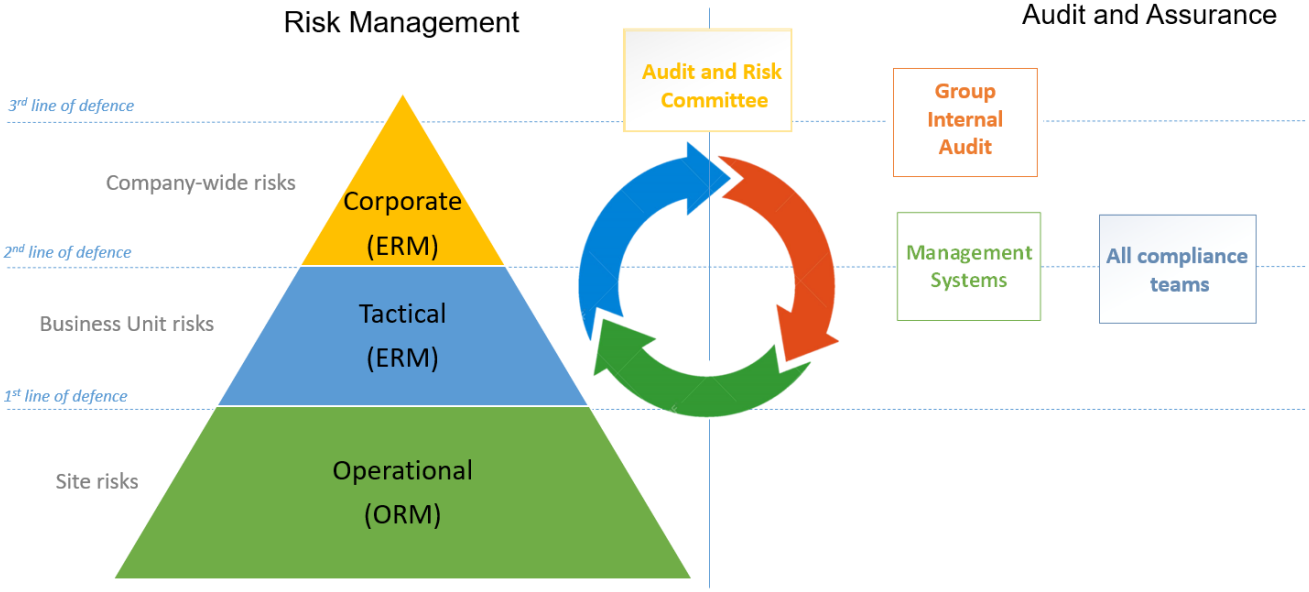
This would aim to:

- enable risks to be assessed consistently across the business with all relevant information in one place.
- provide improved oversight of the company's overall risk profile and insight into detailed risk information.
- produce a more succinct process for prioritising action plans for the mitigation and control of risks.
- allow us to make better investment decisions by balancing risk, performance, and cost.
- streamline and simplify the audit process across the business and enable "Integrated Assurance" – using information about risks in the business to target our audit and assurance efforts and track trends.

The audit module is already live and in use across the business. The risk module is expected to go live in Summer 2023. As part of this roll out, we have cleansed our existing risk data to maximise benefits of the system.

If a more substantial solution is required, involving a capital project, this will be dealt with through our investment management process. Suitable options are considered prior to an agreed solution being agreed. The capital scheme solution is then prioritised for funding based on the risk identified.

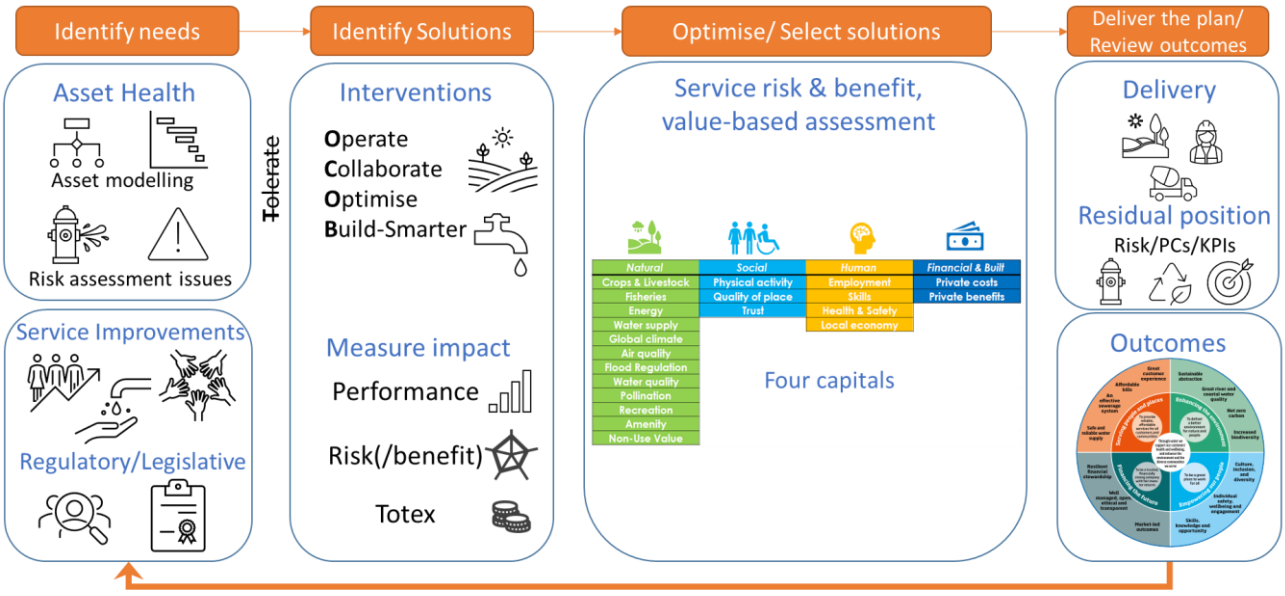
*Figure 3 - New corporate risk system*




## 1.2.2. Investment management

Our new asset and investment management strategy is being implemented utilising the EDA (Enterprise Decision Analytics) decision support tool to enable optimal, data-driven decisions that balance complex factors for an optimal asset investment plan (Figure 4).

*Figure 4 - Asset and investment management overview*




This enables a consistent approach across the business for how we plan, manage and make-decisions on our investments, using service and value-based decision making. It uses a forward-looking approach to project the change in risk, to inform when the risk should be mitigated, and uses a hierarchy of interventions to identify appropriate solutions. The risk reduction and benefits added of each solution is quantified and assigned value using the Service Measure Framework (SMF). The SMF monetises risk and benefits using four capitals, Natural, Social, Human and Financial/Built. When an optimisation is run in EDA, solutions are evaluated to determine the best-value

options and associated optimal timing for implementation, that also effectively contribute to the programme-level risk reduction and performance targets required, within given financial constraints.

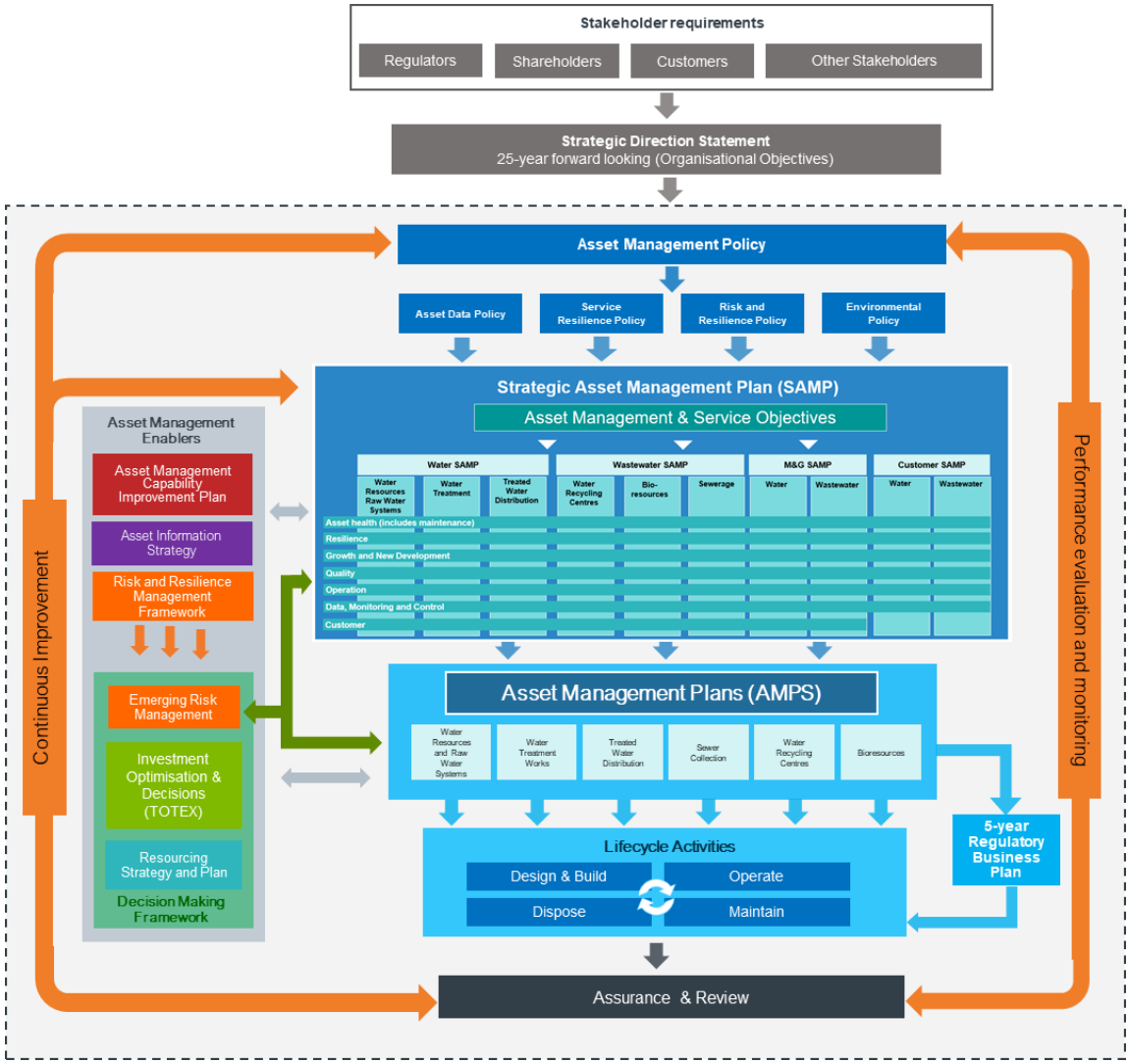
### 1.2.3. Asset management

Our asset management framework (Figure 5) is used to direct, coordinate, and control our asset management activities.

In a Water Company, our assets are used to deliver service to our customers, so our asset management activities include all activities that allow us to:

- establish and deliver the objectives set out in our long-term strategic direction statement (including performance commitments).
- realise value from our assets for customers, communities, stakeholders, shareholders, and the environment.

*Figure 5 - Asset Management Framework*




Our asset management framework includes policies, strategies, plans, information management, decision-making processes and capital and operational delivery. It provides a number of important functions:

- it provides a clear line of sight so that everybody who works for or on behalf of Wessex Water understands how they contribute towards the delivery of our company objectives. The line of sight translates organisational objectives from our strategic direction statement into asset management policy, strategy, and objectives, which cascade down into more detailed asset management plans and delivery activities.
- it ensures that our senior management decisions, strategies, and plans take into account the bottom-up, fact-based realities, i.e., asset capabilities, performance, opportunities and constraints through our risk management and resilience framework and our decision-making governance processes.
- it provides our delivery staff with direct visibility of the purpose of the work they undertake – so they understand why it is needed, not just when and how to do it. This helps with identification and prioritisation of risks as well as encouraging innovation through identifying better ways of achieving objectives.

Our framework allows us to monitor our performance against all objectives through a hierarchy of KPIs and align our decision making and risk management processes to the achievement of objectives at all levels of our organisation.

Our asset management framework applies to the following types of assets:

- Nature based assets e.g., reed bed, sustainable urban drainage.
- Physical assets used for the provision of services to our customers – water resources, treatment, distribution, bioresources and land.
- Equipment, inventory, and properties owned by Wessex Water.
- Data, information and operational technology and digital assets.
- Intangible assets – such as Wessex Water leases, brands, intellectual property rights, licences and software.
- Wessex Water employees and third-party providers.

### 1.2.4. Resilience

‘Resilience is the ability to cope with, and recover from, disruption and anticipate trends and variability in order to maintain services for people and protect the natural environment now and in the future’ (Resilience in the Round, Ofwat, 2017).

Resilience is at the heart of our business plan and is the fundamental driver behind how we deliver our ‘safe and reliable water supply’ strategic outcome. We recognise the responsibility we have in providing essential public services to customers and in managing the natural environment, both now and for future generations. Maintaining and strengthening our resilience is critical to ensuring we can continue to deliver reliable and trustworthy services to our customers. This is particularly true given the landscape of an increasingly frequent experience of more extreme shocks and stresses. To be truly resilient and fit for the future, we recognise we must take a long-term view in our plans and procedures, with an aim to anticipate likely changes and actively respond or adapt as they occur.

In recent years, Covid-19, the war in Ukraine and global economic challenges have highlighted the increasing frailty of our supply chain, including people resources, power, chemicals, materials, technology, information security such that we are having to be more self-reliant and provide increased resilience just to maintain existing service performance (i.e. more generators, increased cyber security, early procurement, additional on-site resilience at key locations).

We face many challenges which will potentially affect our resilience, now and in the future, and we must predict and prepare for these eventualities. We recognise these are sector or wider issues, so we cannot address them all by ourselves, so we will also seek partnerships with others to address specific improvements.

Our Water Resources Management Plan is key to ensuring we maintain a resilient water supply system, particularly due to future predicted environmental and license restrictions, gradual population increase and availability of

sources. Internally, our integrated Grid helps us to maximise use of our sources, while our work as part of West Country Water Resources group is identifying potential new sources.

## 1.3. Servicing new development

We believe we are a fundamental enabler to the delivery of fast, efficient and cost-effective connections to clean and waste water services; to that end we are fully supportive of growing competition in the development space and removal of Developer Services from the price control.

We have an absolute duty to assist developers across the full customer spectrum, irrespective of the scale of their development proposal, or their construction experience.

We are committed to providing excellent service by ensuring customers have all the correct information available to them to make the right decisions for their development, delivering cost reflective solutions that are best for the customer, environment and the community.

See document WSX22 - Developers services strategy and analysis for further details.

### 1.3.1. New Development enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – Developer Services | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | Section 4.1 in document WSX22 | Section 4.1 in document WSX22 sets out the key drivers for capital investment to accommodate housing development driven demand |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | Section 4.1 table 3 in document WSX22 | Section 4.1 in document WSX22 illustrates the likelihood of planned development progressing to implementation by analysis of regional statutory development plans. |
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | N/A | Enhancement capital spend entirely driven by pace of development and unrelated to other base activities |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | Section 4.1 in document WSX22 | Section 4.1 in document WSX22 cites named sewer improvement schemes that are carrying over from 2020-25 due to volume of development in some sewer catchments not matching previous local government development plan forecasts |

| | | | |
|---|---|---|---|
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | Section 1.2 in document WSX22. | Capacity reinforcement investment is mandated through The Water Act and is a statutory core activity |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | Section 4.2 Figures 1 to 3 in document WSX22. | Enhancement investment is directly driven by customer requests to connect to supply and waste services, section 4.2 Figures 1 to 3 in document WSX22 illustrates forecasts property connections which will drive enhancement investment |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | Section 4.2 in document WSX22. | Yes, investment drivers are completely outside of management control, key drivers are customer connection requests, and demands to service development sites |
| **A1.1.2 Best option for customers** | | | |
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | Section 2 in document WSX22. | Section 2 in document WSX22 illustrates the challenges faced to service the development market, enhanced investment requirements vary from strategic development to strategic development, optioneering processes determine the appropriate cost/benefit solution on a case by case basis |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | N/A | A robust cost-benefit analysis will be undertaken on a case by case basis when strategic development progress beyond planning approval stage |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WRMP24 Options Appraisal Technical Appendix section 3 | As an illustration of process for potable water enhancement investment, WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen. |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | N/A | |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | N/A | |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be | N/A | |

| | | | |
|---|---|---|---|
| | reliable and appropriate to the activity and outcomes being proposed? | | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | N/A | |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | N/A | |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | N/A | |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | N/A | |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | N/A | |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | N/A | |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | N/A | |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | |

# 2. Water Resources Management Plan

## 2.1. Overview

We published our draft Water Resources Management Plan (WRMP) in October 2022. Following public consultation, and feedback received from Defra, we have now submitted our revised draft Water Resources Management Plan and Statement of Response. Defra will then determine whether we can publish our plan as a final plan later in 2023.

Our previous Water Resources Management Plan in 2019 forecast a surplus in supplies over demand up to 2045. As identified in the plan, we are currently delivering a 15% leakage reduction compared to a base year of 2017/18, as well as additional household metering and water efficiency activities, which continue to contribute to securing water supplies.

For the development of WRMP24, there have been several step changes in the regulatory planning requirements (see Table 1 below). The combined potential impact of these new requirements means that, with no interventions, Wessex Water forecasts to have an overall planning deficit of over 130 Ml/d by 2079/80 under the dry year critical period scenario, with significant licence reductions in 2035.

*Table 1 - Step changes in regulatory planning requirements for WRMP24*

| Requirement | Description |
|---|---|
| **Drought resilience** | We must improve resilience to even worst historic droughts, by moving from the current 1-in-200 drought events to 1-in-500 drought resilience by 2039, or 2050 at the latest. |
| **Licence reductions** | We must reduce abstraction where necessary from environmentally sensitive sources, particularly in our Chalk catchments by 2035, and not meet new growth in the Hampshire Avon catchment with increased abstraction. |
| **Decision-making** | Regulators require us to move away from least-cost planning to best-value planning. This considers least-cost solutions alongside other outcomes, including carbon emissions, natural capita, and biodiversity net gain. |
| **Distribution Input** | We should plan as a minimum to meet the industry's commitments to reduce the use of public water supply in England per head of population by 20% by 2038, a target set by Defra under the Environment Act 2021. |
| **Leakage** | We should contribute to meet the industry's commitments to reduce leakage by 50% by 2050 |
| **Household demand** | We should contribute to a national ambition on average per capita consumption of 110 litres/person/day by 2050 |

This significant deficit is mainly driven by the new requirement to plan for more extreme droughts, coupled with the need to significantly reduce what we currently abstract to protect the environment, particularly in chalk and salmon rivers. Our contributions towards reducing demand by 2050, mainly through smart metering and water efficiency combined with further leakage reduction will help towards reducing our forecast deficit but new supplies of water will also be required.

Our preferred plan provides best value to our customers and ensures continued protection and enhancement of the environment. Although our forecasts do not predict a step change in the supply demand balance deficit until 2035 under our central planning scenario, in order to ensure supply resilience in 2035 and beyond it is necessary to begin implementing enhanced demand reduction strategies and supply scheme investigations starting in 2025. This will improve our supply resilience in droughts, reducing the risk of supply interruptions or restrictions imposed on customers, and will help to ensure river flows and the wider environment are protected, most notably in the Hampshire Avon catchment.

We are committing to continue to protect chalk streams, as part of the Environment Agency's Environmental Destination programme, by substantially reducing further our abstraction licences by 2035.

To achieve these abstraction reductions to protect the environment, and continue to provide a drought resilient service to customers, we will:

- install smart meters in 95% of household and non-household properties by 2035, focusing initial roll-out on the Hampshire Avon area where abstraction licence reductions are planned from 2035.
- expand our household and non-household water efficiency programmes
- continue to reduce leakage levels from 2025 to meet the regulatory target of 50% reduction by 2050.
- take forward several supply side schemes through design and development to be ready for potential delivery to meet licence reductions in 2035, depending on the outcome of future need and the needs of other users in the Hampshire Avon catchment.
- continue to investigate new regional strategic resource options, such as effluent re-use and/or a new reservoir in the Mendips, with South West Water as our main partner on the West Country Resources Group.

## 2.2. Catchment management

Our extensive catchment management activities are accounted for in the water resources price control however the majority of the benefit is in the avoidance of additional treatment which would fall within the water network plus price control.

Risks and opportunities are prioritised by our Catchment Drinking Water Safety Planning (DWSP) team and Hydrogeology team. The catchment management delivery team includes agricultural advisers who engage with farmers and landowners, providing advice and training and where appropriate financial support, as well as the Environment Agency, to ensure at least compliance with agricultural regulations and beyond if possible.

See WSX12- Water Resources strategy and investment for further details.

## 2.3. Strategic resource options

We are working as part of West Country Water Resources Group, along with South West Water, and the EA, to support a coordinated approach to water resources planning in the South West of England that transcends water company boundaries. The group assesses the potential to balance water supply with demand through a common regional understanding, while dealing with a range of challenges in the West Country. The group aims to do this by building a common regional understanding of:

- the current and future availability of water resources in the West Country region
- the needs of all water users, including those who take water directly from the source rather than being supplied by a water company
- the factors that are likely to affect water supply and demand in the future, such as economic growth, forecast population, and the uncertainties of climate change

- options for improving the balance of water supply and demand in the West Country region, including cross-sector solutions made possible by engaging with other water users, considering environmental issues and impacts
- options for future water transfers both between water companies in the West Country and to other regions

We are assessing the feasibility of a number of strategic resource options (SROs) for potential delivery in the medium-long term. Options being considered include:

- re-purposing of a quarry for use as a raw water storage reservoir, using water abstracted from the Bristol Avon. Treatment options, as well as raw and potable transfer options are being considered
- construction of a new raw water reservoir which would utilise available water in current abstraction licenses. Additional treatment capability and transfer pipelines are included in the scope of this scheme
- repurposing final effluent, with increased treatment to polish the already highly treated water, for discharge into a wetland and on into the river, for downstream abstraction and treatment.

Preparatory work is already underway to enable submission at future price reviews. Ofwat has recently confirmed their commitment to continue and enhance regional water resource planning.

The Bristol reservoir SRO is likely to be first to be implemented with the aim of increasing resilience in the area and transferring part of the flow to support South West Water.

All of the cost of the appraisal of these SROs in the AMP8 period is being allocated to the water resources price control. Delivery of the schemes post 2030 will include significant expenditure within the water network plus price control.

## 2.4. Smart metering

Smart metering and the subsequent two sections on leakage and water efficiency are the key components of our holistic demand management strategy. The drivers and option development for these activities come from our revised draft WRMP24 (see summary in document WSX12 Section 2 and full plan in document WSX61), the preferred solutions are described here as they are funded through the Water Network Plus price control. For more information on our preferred demand management strategy please see document WSX15 Annex 2.

As noted previously in our revised draft Water Resources Management Plan (WRMP) we proposed 75% of properties (HH & NHH) would be smart metered by 2030. However, in response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods we have significantly reduced our smart metering programme to 40% smart meter penetration by 2030. However, we remain committed to completing our smart meter roll-out to 95% of properties in our region by 2035.

Smart metering strategy summary

*Table 2 - Summary table of key benefits of smart metering*

| Demand reduction strategy target | Value from smart metering |
|---|---|
| Engage with customers to reduce average consumption to 110 l/h/d by 2050 | High resolution consumption data will enable demand savings to be made against two elements of household and non-household demand:<br>• Rapid detection of properties with continuous flows that may be indicative of internal plumbing leaks. Customers can then be notified of the likelihood of a leak, which may have gone unnoticed, and offered support to fix with an associated water efficiency programme (involving advice and/or leak fix service).<br>• Many customers currently have a low understanding of how much water they use in part because their consumption data is currently only available on a 6-monthly basis, or monthly for some NHHs. The availability of higher frequency usage information presented to customers in engaging and appropriate ways can support behavioural change to drive reductions in consumption. |
| Reduce non-household consumption by 9% by 2037/38 | |
| Halve leakage by 2050 | • Rapid identification of customer side leaks, reducing run times<br>• Greater understanding of our supply network, highlighting higher leakage zones to focus active leakage control activities |

Our smart metering programme is at the heart of our demand management strategy. The high-resolution usage data provided by smart meters will allow us to better target both leakage reduction and water efficiency activities. The key drivers for investment in our smart metering programme are our forecast supply demand balance deficit from 2035, and the regulatory demand reduction targets in Table 2 above which all contribute to the delivery of our statutory target to reduce distribution input per capita by 20% by 2037/38.

We plan to install 257,000 smart meters between 2025-2030 covering 40% of properties in our region, including households and non-households. Initial roll-out in AMP8 will focus in the Hampshire Avon catchment and connected areas where significant abstraction licence reductions are proposed from 2035. Associated demand savings in these areas will provide the greatest environmental benefits and reduce the requirement for future supply side schemes. In AMP9 we'll install a further 380,000 smart meters across our region increasing coverage to 95% of properties and completing our smart metering programme.

Completion by 2035 will enable us to realise the benefits in time to inform future rounds of WRMP planning, and investment decisions on supply side schemes, in line with our adaptive planning process. Timely completion will also be key in meeting our statutory DI reduction target in 2037/38 and ensuring we keep pace with the data revolution already well underway across the industry.

We have chosen advanced metering infrastructure (AMI) over advanced meter reading (AMR) smart technology as AMI provides a markedly higher granularity of usage data enabling us to achieve greater demand reduction benefits. To achieve our target meter penetration, a combination of different communication technologies (licenced radio and low powered wide area network) may be required due to the topography of our region and dispersion of customer properties.

Our approach to smart meter rollout will achieve maximum impact as quickly as possible. Initial rollout will be focused in urban/ semi-urban areas where meter installations will be efficient and communication infrastructure simpler. We will aim to complete installation street by street, DMA by DMA as far as possible to realise install efficiencies, greater accuracy in our flow balance calculations and associated leakage benefits. In AMP9 we will

expand our roll-out to more rural areas across our region, capitalising on advances in technology (e.g., NBIoT) to install smart meters in locations that would have previously been prohibitively expensive.

As smart meter data becomes available it will quickly bring efficiencies to current demand reduction strategies and allow us to develop new tools for engaging with customers on water efficiency. As technologies develop, smart metering could become the backbone of a smart network strategy that facilitates continual progress towards optimal operation of the whole supply system from source to tap.

Tables summarising associated costs and demand reduction benefits for both household and non-household smart metering programmes are shown below.

*Table 3 - Summary of household smart meter installation numbers, costs and benefits*

| | AMP8 | | | | | AMP9 | AMP10+ |
|---|---|---|---|---|---|---|---|
| | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-2035 | 2035-2050 |
| Smart Meter Installs – total (000s) | 48.22 | 48.18 | 48.25 | 47.88 | 47.50 | 356.40 | 52.67 |
| Smart Meter Installs - none to AMI (000s) | 11.01 | 10.67 | 10.38 | 10.12 | 9.91 | 68.27 | 0* |
| Smart Meter Installs - basic to AMI & new properties (000s) | 37.21 | 37.51 | 37.87 | 37.75 | 37.59 | 288.12 | 52.67 |
| Smart Meter Installation Costs[1] (£000s) | £14,569 | £14,346 | £14,164 | £13,206 | £12,840 | £101,106 | £36,118 |
| Smart Meter Operating Costs (£000s) | £713 | £1,313 | £1,915 | £2,511 | £3,103 | £28,363 | £116,737 |
| Cumulative Demand Reductions[2] (Ml/d) | 0.69 | 1.59 | 2.66 | 3.87 | 5.20 | 14.86 | 20.24 |

*Smart metering at saturation, and so subsequent meters installed are for meter replacement only under this category. Costs for these replacements are included in the cost lines.
[1] Includes meter installation, IT startup costs for the first three years of AMP8 and meter replacement costs.
[2] Includes metering linked consumption reduction and customer supply pipe leakage savings.

*Table 4 - Summary of non-household smart meter installation numbers, costs, and benefits*

| | AMP8 | | | | | AMP9 | AMP10+ |
|---|---|---|---|---|---|---|---|
| | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-2035 | 2035-2050 |
| Smart Meter Installs – total (000s) | 3.36 | 3.35 | 3.34 | 3.33 | 3.32 | 26.56 | 0.00 |
| Smart Meter Installs - none to AMI (000s) | 0.19 | 0.18 | 0.17 | 0.16 | 0.16 | 1.16 | 0* |
| Smart Meter Installs - basic to AMI (000s) | 3.17 | 3.17 | 3.17 | 3.17 | 3.17 | 25.40 | 0* |
| Smart Meter Installation Costs[1] (£000s) | £1,015 | £1,012 | £1,008 | £1,004 | £1,001 | £15,829 | £63,438 |
| Smart Meter Operating Costs (£000s) | £42 | £84 | £125 | £167 | £208 | £2,034 | £8,089 |
| Cumulative Demand Reductions[2] (Ml/d) | 0.30 | 0.62 | 0.93 | 1.25 | 1.58 | 4.14 | 4.25 |

* Smart metering at saturation, and so subsequent meters installed are for meter replacement only under this category. Costs for these replacements are included in the cost lines.
[1] Includes meter installation and meter replacement costs.
[2] Includes metering linked consumption reduction, and customer supply pipe leakage savings.

Benefits of smart metering

The benefits of smart metering centre around the valuable customer usage data smart meters provide and how this data can be transformed into demand savings through identifying and resolving internal and supply pipe leakage and offering tailored support to customers on water efficiency.

Currently, we typically obtain two meter reads a year from our basic meters, each providing a total volume used over six months. Where reads are significantly higher than a baseline for that property, this would be flagged, and the property may be subsequently visited by a Customer Inspector to ascertain whether the increase is due to internal plumbing losses or supply pipe leakage. From this type of data, we cannot detect smaller levels of wastage as small changes are likely to be attributed to additional people living in the household. It also provides no indication of how long the wastage has been ongoing within the six-month period.

Advanced metering infrastructure (AMI) smart metering provides detailed usage data at a property level, with hourly reads uploaded at least once daily. Associated supply pipe leakage or internal plumbing losses can be detected within days rather than waiting until the next six-monthly meter read or a customer phoning in when they've detected a visible leak, significantly reducing leak run times.

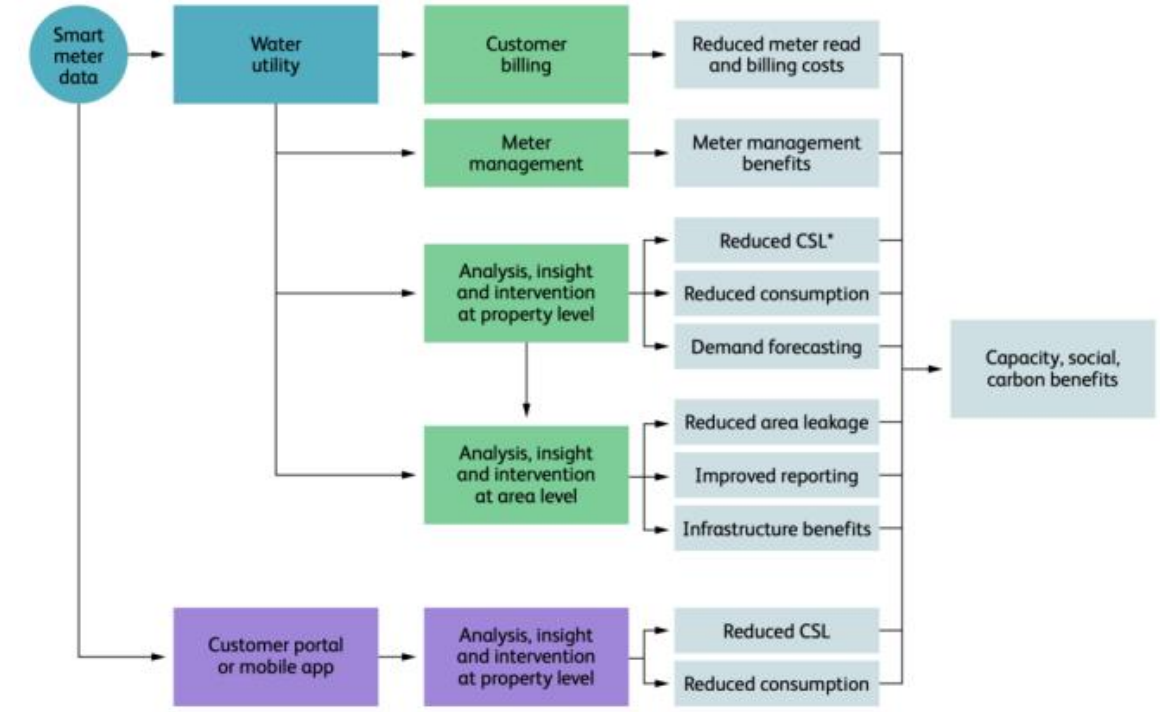
Customers will have access to their smart meter data through an app or customer portal, empowering them to understand their usage and make changes to reduce waste and manage their bills. We will use high resolution usage data from smart meters to target water efficiency engagement with customers, including a significant expansion of our Home Check programme.

The granularity of usage data from smart meters provides opportunities for efficiencies in existing demand reduction strategies as well as enabling new approaches, all to improve our level of service to customers and help protect the environment.

In addition to demand reduction, smart metering will bring further benefits such as providing the data required to better understand and predict customer usage to inform future business planning. It will also provide scope to introduce tariff innovation in the future to incentivise further consumption reduction. A summary of smart metering benefits is shown in Figure 6 below.

Further, more detailed information on our smart metering proposals can be found in our updated WRMP demand management strategy document in WSX15 annex 2.

*Figure 6. Schematic showing summary of smart meter benefits from Artesia report for Wessex Water.*




* Note: CSL = customer side leakage.

### 2.4.1. Smart metering enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – Smart Metering | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX14 section 2.4 strategy summary and WSX15 annex 2 section 1 | WSX14 section 2.4 strategy summary and WSX15 annex 2 section 1 of our revised Demand Management Strategy set out the key drivers for our smart metering programme. |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX14 section 2.4 strategy summary and WSX15 annex 2 section 1 | WSX14 section 2.4 strategy summary and WSX15 annex 2 section 1 of our revised Demand Management Strategy set out the key drivers for our smart metering programme and highlight the need for delivery over the next 2 AMPs to realise demand reduction benefits ahead of abstraction licence reductions from 2035 and to meet our statutory DI reduction target by 2037/38. |

| | | | |
|---|---|---|---|
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | N/A | Smart metering is 100% enhancement, however current proactive and reactive meter replacements are covered under base. Proactive meter replacement will cease during smart meter roll-out and reactive will continue as normal |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | N/A | No, smart metering is a new programme starting in AMP8 |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX03 sections 3.2 and 3.3 | Yes, smart metering is included as part of demand management strategy 7 in the core pathway of the water resources and water treatment and supply adaptive plans. |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | WSX15 annex 2 section 3 | WSX15 annex 2 section 3 outlines how our demand management strategy as a whole aligns with key customer insight. |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | WSX14 section 2.4 strategy summary and<br>WSX15 annex 2 section 1 and | Yes, the key drivers – regulatory targets and abstraction license reductions are outside of management control |
| **A1.1.2 Best option for customers** | | | |
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix section 4.1.3 and 4.1.2 | WRMP options appraisal process had an appropriate number and range of feasible options, based on Ofwat draft WRMP representation. WRMP24 Options Appraisal Technical Appendix provides additional information |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix | WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WSX12 section 2.7.7 | Section presents comparison of least cost and preferred plan for the main WRMP planning scenario. |

| | | | |
|---|---|---|---|
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX14 section 2.4 WSX15 annex 2 section 2 | Tables in WSX14 section 2.4 (summary of HH & NHH smart meter installation numbers, costs and benefits) provide the total demand reduction benefits attributable to smart metering. WSX15 annex 2 section 2 shows how savings attributed to the demand management strategy as a whole align with our statutory DI reduction target. |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX12 section 2.7.2 and 2.7.3 | Risk and optimism bias included in costs, and supply and demand options modularised |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | N/A | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | WSX12 section 2.9 | See also WSX04 |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 outlines how smart metering costs were derived |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 outlines how smart metering costs were derived |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | N/A | No |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | N/A | |

| | | | |
|---|---|---|---|
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | WSX26 section 2.4 | Yes, PCDW12 covers metering and smart metering |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | WSX26 section 2.4 | |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | |

## 2.5. Leakage reduction

As noted previously in our revised Water Resources Management Plan, we proposed a 7.7Ml/d reduction leakage split between 5Ml/d of distribution losses and 2.7Ml/d in customer losses.

However, in response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods we have significantly reduced our proposed leakage reduction and smart metering programmes from that just proposed in our revised WRMP. Our forecast leakage reduction in AMP8 has reduced from to 3.5Ml/d as shown below.

*Table 5 – Business plan revised leakage reduction*

| Cumulative reduction | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
|---|---|---|---|---|---|
| Distribution losses (Ml/d) | 0.37 | 0.75 | 1.14 | 1.53 | 1.92 |
| Customer losses (Ml//d) | 0.09 | 0.29 | 0.60 | 1.03 | 1.58 |
| Total leakage (Ml/d) | 0.46 | 1.04 | 1.75 | 2.56 | 3.50 |

The reduction in distribution losses will be delivered by an integrated strategy involving increased activity in a number of areas including active leakage, pressure management, control and data and systems improvements together with new initiatives on trunk mains. The below summarises the leakage activities where enhancement funding will be used to reduce leakage to target levels.

**Active Leakage Control (ALC, including acoustic logging)**

Active Leakage Control (ALC) is the term used to describe the central leakage management policy of monitoring our network for leakage, and then deploying resources to detect the source of the leakage, then repair crews to fix the leakage. We currently find and fix around 15,000 leaks each year and around 50% of these leaks are invisible.

We monitor leakage on our 12,000 km water mains network by segregating it into discrete District Metered Areas (DMAs), into which we can measure flow rates. Within DMAs, we create further discrete network areas, known as Control Zones, which enable us to home in on leakage increases more effectively.

Our leak detection is carried out by a core team of Leakage Inspectors, who are highly skilled and aided by the latest technology and equipment to help locate leakage quickly and accurately. Most leak detection technology is based on acoustic principles to identify leaks through characterising sound. We have thousands of acoustic leakage devices deployed across our network that monitor for the occurrence of leaks and provide early alerts.

Our AMP 8 plans in this area include:

- Creating new Control Zones, to break our current DMAs down further to identify specific areas of higher leakage more efficiently.
- Increasing the size of our Leakage Inspector detection and repair teams to minimise leakage increases and respond more quickly to leakage breakout.
- Increase the number of acoustic loggers installed significantly increasing the proportion of our network covered by this technology

**Pressure management (including calm networks)**

Forms of pressure control are widely applied at Wessex Water as an effective leakage management approach. Benefits go further than immediate reduction of leakage rates – effective pressure management also helps reduce burst rates, and creates a “calmer” operating network, which prolongs asset life and reduces water quality risks such as black, brown, orange (BBO).

Pressure management

We have a very mature pressure management operation, with around 2,000 pressure reducing valve (PRV) assets in service, controlling the pressure delivered to around three-quarters of WW properties. These PRV assets are monitored and maintained by an established, skilled team of technicians. The valves are often fitted with the latest technology full modulation control devices. These devices regulate pressure as flow varies, allowing us to operate a stable network, providing consistent levels of service to customers whilst minimising leakage rates.

Our AMP 8 plans in this area include:

- Increasing the number of full flow modulation control devices we have in operation to further optimise pressure delivery.
- Expanding the range of control technology to include creating up to 100 closed loop systems. Closed loop systems regulate pressure delivery to a set point, such as the highest property in an area, to ensure good service standards are operated throughout. This method of control will also be installed where the water supply is boosted by pumps. Closed loop systems allow careful management of local network pressure, optimising control to supply minimum pressure to a critical point without over pressurising other sections of the network, reducing leakage risk.
- We will increase the team of skilled Technicians installing and maintaining equipment.

Calm networks

Calm network activities involve identifying pressure transients through monitors and software and then taking action to reduce or eliminate the cause of these transients. Pressure transients are temporary waves or pressure that cause stress on pipework and fittings which can lead to leaks or bursts. On pumping mains, quick stopping and starting of pumps can cause pressure transients, a solution to this may be installing variable speed drives to initiate a slow start or installing a surge vessel. Similar issues can be caused if valves in the network are opened or closed too quickly. To this end all Wessex Water Distribution and Leakage field staff have recently attended Calm network training to ensure they operate network assets in such a way as to minimise the risk of pressure transients.

Calm networks is a field where the use of new technology will be key to ensuring we have accurate information on the extent of pressure transients across our network. Identifying pressure transients in itself won't prevent leakage, a joined-up approach is required with other operational departments to ensure solutions are identified and implemented.

Our AMP 8 plans in this area include:

- Creating a dedicated team to focus on calm network improvements, with the aim of further preventing bursts and potential interruptions to supply for customers.
- Installing high resolution monitors to identify pressure transients that may occur in our networks and cause leaks and bursts.
- Designing and implementing solutions to minimise pressure surges.

**Trunk mains**

Trunk mains refers to the pipe networks generally upstream of the DMA areas where water is delivered to most customers. Trunk mains are usually strategically important in conveying large volumes of water over large distances, such as between water treatment centres and service reservoirs, and transfer mains that make up our integrated water supply Grid system. Trunk mains are generally large diameter and operate at higher pressures through less populated areas of the region.

Due to operating parameters, trunk mains don't have the consistent minimum night flows seen in other areas of the network and maintaining accurate flow metering is also more difficult. This makes leak detection on trunk mains uniquely challenging, especially coupled with having less places to install acoustic detection technology (less hydrants, air valves etc.).

Our AMP 8 plans in this area include:

- Expanding the Trunk Main Leakage team, increasing Engineers working on these networks to improve leak detection outcomes in a challenging environment.
- Invest in additional monitoring and measurement, which will involve significant engineering works to deliver. For example, metering improvements to enhance data accuracy and better identify leakage.

**Smart metering and CSP leakage**

The reduction in customer losses will be delivered through our proposed smart metering strategy.

Customer supply pipe (CSP) leakage currently accounts for approximately 20% of the total leakage in our region. Customers own and are responsible for their own supply pipes, however, we currently operate a generous free leak repair policy which includes supply pipe replacement where required for pipes up to twelve meters in length, unless cost of this is excessive due to reinstatement of decorative paving etc. This policy allows us to realise leakage benefits associated with CSP leak repairs by ensuring leaks are resolved promptly once identified.

CSP leaks are currently either identified by customers who contact us to report them or by our leakage inspectors identifying them through ALC activities. Smart metering will initiate a huge shift in how we identify CSP leaks as there will be detailed flow data for every metered property allowing rapid identification of continuous flows, a proportion of which will be associated with CSP leakage.

We plan to install 257,000 AMI smart meters on household and non-household properties by 2030 (increasing to 640,000 by 2035). These meters will provide hourly flow data for each property with data uploaded daily to our company platforms and customer portal. Data analysis software will automatically identify continuous night flows and categorise these in order of volume. We will inform customers of potential leaks and continue to support them to resolve leaks both in their property and on their supply pipe, significantly reducing run times compared to traditional supply pipe leakage detection methods.

Further, more detailed information on our leakage strategy can be found in our updated WRMP demand management strategy document in WSX15 annexe 2.

### 2.5.1. Leakage reduction enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – Leakage Reduction | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX14 section 2.5 strategy summary and WSX15 annex 2 | WSX14 section 2.5 strategy summary and WSX15 annex 2 our Demand Management Strategy set out the key drivers for leakage reduction programme. |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX14 section 2.5 strategy summary and WSX15 annex 2 | As above, highlights the need for demand reduction benefits ahead of abstraction licence reductions from 2035 and to meet our statutory DI reduction target by 2037/38. |
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | N/A | Our plan is based on maintaining leakage being funded from base, and reducing leakage funded by enhancement |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | N/A | No |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX03 sections 3.2 and 3.3 | Yes, leakage reduction is included as part of demand management strategy in the core pathway of the water resources and water treatment and supply adaptive plans. |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | WSX15 annex 2 section 3 | WSX15 annex 2 section 3 outlines how our demand management strategy as a whole aligns with key customer insight. |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | WSX14 section 2.5 strategy summary and WSX15 annex 2 | Yes, the key drivers – regulatory targets and abstraction license reductions are outside of management control |
| **A1.1.2 Best option for customers** | | | |

| | | | |
|---|---|---|---|
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix section 4.1.3 and 4.1.2 | WRMP options appraisal process had an appropriate number and range of feasible options, based on Ofwat draft WRMP representation. WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix | WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WSX12 section 2.7.7 | Section presents comparison of least cost and preferred plan for the main WRMP planning scenario. |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX14 section 2.5 and WSX15 annex 2 section 2 and section 6 | Leakage is a mandatory performance commitment. WSX15 annex 2 section 2 shows how savings attributed to the demand management strategy as a whole align with our statutory DI reduction target. WSX15 annex 2 section 6 shows how our forecast leakage reduction profile aligns with targets |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX12 section 2.7.2 and 2.7.3 | Uncertainties relating to costs and benefit delivery can not be fully mitigated, but we are proposing a flexible multi solutions approach based on previous successful delivery to mitigate these risks. Risk and optimism bias included in costs, and supply and demand options modularised |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | N/A | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information | WSX12 section 2.9 | See also WSX04 |

| | | | |
|---|---|---|---|
| | (including alternatives and its contribution to addressing the need) to have informed views? | | |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 outlines how smart metering costs were derived |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | We have utilised the expertise of external consultant in the development of the costs and benefits of all viable leakage reduction options |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | N/A | |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | WSX26 section 2.4 | Yes, PCDW10 covers leakage improvements |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | WSX26 section 2.4 | Yes |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | |

## 2.6. Water Efficiency

Household water efficiency

The availability of high-resolution consumption data arising from the smart metering roll out will facilitate ever better targeting of water efficiency services, and in particular our Home Check programme for household customers. Our existing Home Check programme which involves an in-home visit from a technician to fit water saving devices, check for plumbing leaks and offer tailored behavioural advice on water saving, targets the highest water using households using 6-monthly meter read information to maximise the savings per visit.

From 2025-2030 our preferred programme will include 12,000 standard Home Check visits and 4,800 plumbing leak fix visits a year. This is a significant increase in activity level from the current period (2020-25) which is seeing us deliver around 4,500 standard visits and 750 plumbing leak fix visits a year. Our experience of delivering in-home support to customers in programmes like these since 2016 will make the expansion of this Home Check programme feasible when paired with the smart metering programme to provide data and insight to target and drive the focus areas.

To help us meet the statutory demand reduction target by 2037/38 we expect to step up the Home Check activity level from 2030 to over 17,000 standard visits and over 8,500 plumbing leak fixes a year. This will represent a further significant increase in scale, and is undoubtedly ambitious, but will follow a further five years of delivery, monitoring, innovation and collaboration with customers though our water efficiency and smart metering programmes.

An example of the innovation we are currently applying to our Home Check service is our community ‘Rainsavers’ project in Chippenham. This trial involving over 200 households has seen us expand the Home Check offering to include the installation of free water butts and ‘soaker hoses’ to include garden water savings into the programme. A soaker hose is a porous pipe that, in this context, allows a water but to rapidly drain the water being collected during a rainstorm directly into borders and vegetable patches. Importantly though, the soaker hose is diverting rainfall away from combined sewers and therefore represents a holistic approach that benefits not only demand management but also our drainage and wastewater strategies. The findings from this project, undertaken in 2023, are still being assessed but customer feedback is indicating that it has expanded the community’s awareness of the issues of water use and rainfall drainage and that there is an appetite for engagement of this nature.

Learning from innovative approaches like ‘Rainsavers’ will help to shape and optimise the delivery of our future water efficiency engagement programmes and overall adaptive plan.

Government water labelling

Our WRMP24 planning has assumed that government will introduce mandatory water efficiency labelling for appliances from 2025/26. This will give consumers the information they need to make informed decisions when purchasing new water using products for their home. It will also help developers and water companies to improve water efficiency in buildings. It will likely involve a tiered labelling approach that allows products to be rated at levels of water consumption, similar to the energy efficiency label.

As per the September 2022 Defra consultation on labelling we have assumed that labelling will be introduced without associated changes to building standards or regulations. The impact of this scenario will be to reduce per capita consumption by 1.5 litres per person per day by 2035 and by 13 litres by 2050. For the Wessex Water supply region this amounts to savings of 2.2 Ml/d by 2035 and nearly 20 Ml/d by 2050.

To ensure customers understand and engage with the new water labelling information our preferred plan includes an allowance for engagement campaigns and activities to help realise the demand savings plus engagement with building developers. While changes to building standards are not being included in this government measure at this time, we are keen to support future work in this area through partnerships, research and lobbying.

Non-household (business) demand

Our smart metering roll out will include non-household properties and we commit to working with MOSL, retailers and business users to ensure the data captured by smart meters is appropriately available within the market to improve billing accuracy and stimulate demand reductions through the identification of continuous flows which may be indicative of wastage, plumbing losses and external leaks.

In 2022 we relaunched a non-household water efficiency programme following a hiatus of several years since market separation. Our current programme has focussed support to schools and has been delivered through collaboration with both retailers and the Department for Education. The programme focusses on identifying and resolving leaks and wastage arising from toilets, urinals and taps. In 2022-23 we visited 91 schools; this activity was one of the most cost-effective elements of our water efficiency strategy.

Our preferred plan for non-household demand management for 2025-30 will include over 160 visits a year to non-households to fix leaks and reduce water wastage. We anticipate continuing to work with schools and other not-for profit or community focussed organisations. This programme will be supported by the smart metering roll out that will provide high resolution usage data to identify continuous flows – which can be investigated for leaks/wastage – and therefore enhance targeting.

Our assumed model of delivery for the non-household water efficiency programme of visits is wholesaler-led, although collaboration with retailers is integral to the engagement with individual business users. We are actively engaged with the Retailer-Wholesaler Group's Water Efficiency Sub-Group which we see as a vehicle to support innovation for collaboration between wholesalers and retailers to enhance water efficiency in the non-household market.

The combination of a smart metering for non-households and the targeted water efficiency programme will ensure we meet the targets to reduce business demand by 9% by 2037/38 and 15% by 2050.

Further, more detailed information on our water efficiency strategy can be found in our updated WRMP demand management strategy document in WSX15 annexe 2.

### 2.6.1. Water efficiency enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – Water Efficiency | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX14 section 2.5 strategy summary and WSX15 annex 2 | WSX14 section 2.4 strategy summary and WSX15 annex 2 section 1 of our revised Demand Management Strategy set out the key drivers for our smart metering programme. |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX14 section 2.4 strategy summary and WSX15 annex 2 | WSX14 section 2.4 strategy summary and WSX15 annex 2 of our revised Demand Management Strategy set out the key drivers for the portfolio of options included in our strategy to ensure we realise the benefits ahead of abstraction |

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| | | | licence reductions from 2035 and to meet our statutory DI reduction target by 2037/38. |
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | No | Our water efficiency Home Check visits and non-household activities are sperate to our wider water efficiency engagement. |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | N/A | No |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX03 sections 3.2 and 3.3 | Yes, smart metering is included as part of demand management strategy 7 in the core pathway of the water resources and water treatment and supply adaptive plans. |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | WSX15 annex 2 section 3<br><br>WSX04 sections 2 and 3.5.<br>N/A | WSX15 annex 2 section 3 outlines how our demand management strategy as a whole aligns with key customer insight.<br><br>WSX04 includes further detail on the customer research undertaken and outputs are summarised for the sustainable abstraction outcome. |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | WSX14 section 2.5 strategy summary and<br>WSX15 annex 2<br>N/A | Yes, the key drivers – regulatory targets and abstraction license reductions are outside of management control. |
| **A1.1.2 Best option for customers** | | | |
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix section 4.1.3 and 4.1.2 | WRMP options appraisal process had an appropriate number and range of feasible options, based on Ofwat draft WRMP representation. WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX12 section 2.7 WRMP24 Options Appraisal Technical Appendix | WRMP24 Options Appraisal Technical Appendix outlines how options were developed and chosen |

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| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WSX12 section 2.7.7 | Section presents comparison of least cost and preferred plan for the main WRMP planning scenario. |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX15 annex 2 section 2 | WSX15 annex 2 section 2 shows how savings attributed to the demand management strategy as a whole align with our statutory DI reduction target |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX12 section 2.7.2 and 2.7.3 | Risk and optimism bias included in costs, and supply and demand options modularised |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | N/A | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | WSX12 section 2.9 | See also WSX04 |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 outlines how smart metering costs were derived |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | WRMP24 Options Appraisal Technical Appendix section 4.2.3 | WRMP24 Options Appraisal Technical Appendix section 4.2.3 outlines how smart metering costs were derived |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | N/A | No |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | N/A |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for | N/A | N/A |

| | | | |
|---|---|---|---|
| | evidenced special factors without an enhancement model adjustment? | | |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | N/A |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | N/A | N/A |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | N/A | N/A |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | N/A |

# 3. Water quality submission to the DWI

## 3.1. Overview

We submitted our PR24 drinking water quality submission to the Drinking Water Inspectorate in March 2023 which is reproduced in WSX15 - Water networks plus strategy and investment Annex 1 including our lead strategy and appendices for lead and nitrate removal at the site WxW_SS131. A summary of our improvement programmes is shown in the table below.

*Table 6 – Summary our drinking water quality improvement programme*

| Drinking water quality driver | Brief description | Number of schemes | Regulatory support |
|---|---|---|---|
| Nitrates | Installation of Nitrate treatment at the site WxW_SS131. | 1 | DWI letter of support received see WSX15 |
| Nitrates | Enhanced catchment management at high-risk nitrate catchments where previous catchment work has failed to reverse the nitrate trend | 10 | Supported in Environment Agency's WINEP |
| Lead | Delivery of our public health focussed proactive lead replacement programme | 1 | DWI support requested |
| Disinfection improvements | Programme of works to improve disinfection | Rolling programme | DWI commendation requested |
| Customer contacts (Appearance, Taste & Odour) | Programme of works including trunk main replacement | Rolling programme | DWI letter of support received see WSX15, existing Reg 28 notice to be updated |

The improvements in Nitrates and Lead above will be funded through enhancement, whereas the rolling programme disinfection improvements and customer contacts about water quality (Appearance, Taste & Odour) in AMP8 and beyond will be delivered through maintenance.

All of the above are covered by the Water networks plus price control except for the enhanced catchment management which is detailed in WSX12 - Water resources strategy and investment.

The above table is a summary of our new initiatives over and above all of our existing activities, for example, continuation of our existing catchment management activities for nitrates, pesticides and PFAS etc, see WSX15 - Water networks plus strategy and investment Annex 1 for our PR24 drinking water quality submission to the Drinking Water Inspectorate for further details.

### 3.1.1. Nitrate treatment enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – site WxW_SS89 (Addressing raw water quality deterioration - grey solutions CW3.97-99) | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX15 annex 1 | Following our PR24 water quality submission the DWI have issued a Final Decision Letter of Support for the proposed scheme as detailed in WSX15 Annex 1. Increasing nitrate trend requires action to safeguard supply from this significant baseload source. |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX15 annex 1 | Yes, as above, DWI have issued a Final Decision Letter of Support |
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | WSX15 annex 1 and WSX14 Section 6.3.2 | No, the nitrate treatment plant is required due to raw water deterioration |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | WSX15 annex 1 | Yes, previous and current catchment management and blending schemes have enabled this treatment scheme to be deferred to AMP8 but the continually rising nitrate levels mean treatment can no longer be deferred |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX03 Section 3.3.5 | Yes, see Adaptive Path P2 – Enhanced nitrate removal |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | WSX02 Section 2.4 | Yes, Customers perceive the provision of clean, safe drinking water as a core element of Wessex Water's service |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | WSX15 annex 1 | Yes, as above Previous catchment management and blending schemes have enabled this treatment scheme to be deferred to AMP8 but the continually rising nitrate levels mean treatment can no longer be deferred |

| A1.1.2 Best option for customers | | | |
|---|---|---|---|
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX15 annex 1 | Yes, previous and current catchment management and blending schemes have enabled this treatment scheme to be deferred to AMP8 but the continually rising nitrate levels mean treatment can no longer be deferred |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX15 annex 1 | Yes, treatment is now the only option for this site, and we have engaged with the supply chain to identify the most cost effective treatment technology for this site |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WSX15 annex 1 | Yes, the treatment technology selected was based on minimising the waste stream generated as this has potentially the greatest whole life carbon impact |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX15 annex 1 | The impact is in maintaining the deployable output from this significant baseload source |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX15 annex 1 | Yes, the technology treats a proportion of the flow to a low nitrate level which is then blended with the remining flow to achieve compliance enabling treatment utilisation to minimised to only that necessary to achieve compliance and robust operation of the plant |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | N/A | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | N/A | |

| | | | |
|---|---|---|---|
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WSX14 Section 6.3.2 | Yes, the treatment technology selected was based on minimising the waste stream generated as this has potentially the greatest whole life carbon impact |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | Yes | We have used the cost consultant ChandlerKBS to benchmark our costs. The ChandlerKBS benchmark was 3.7% below the number used in the plan. Based on the AACE classification, the overall ChandlerKBS accuracy range overlaps with the Wessex Water range which indicates a high probability of the outturn costs falling in this range. Therefore, the estimates can be deemed to be robustly efficient for Business Planning. |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | Yes | We have used the cost consultant ChandlerKBS to benchmark our costs. |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | N/A | |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | WSX26 Section 2 | Yes, PCDW14 covers the nitrate treatment plant at the site WxW_SS131. |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | WSX26 section 2 | Yes |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | |

### 3.1.2. Lead pipe replacement enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement – Lead pipe replacement | See section | Comment |
|---|---|---|---|
| **A1.1.1 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (i.e., there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | Following our PR24 water quality submission the DWI have indicated a Final Decision Letter of Support for the proposed scheme as detailed in WSX14 Section 7.6.3 will be sent shortly |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | As above. |
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | N/A | Our proposed water quality driven reactive and proactive lead pipe replacement programme is a continuation of existing practice and does not overlap with activities delivered through base |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | N/A | No |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX03 section 3.3 | Yes, the continuation of our lead pipe replacement programme forms part of our core pathway and we have Adaptive Path P3 – Acceleration of lead pipe replacement/ relining |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | WSX02 Section 2.4 | Yes, Customers perceive the provision of clean, safe drinking water as a core element of Wessex Water's service |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (e.g. spend to save) been accounted for? | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | Yes, driven by DWI aspiration for companies to progress towards a lead free network |
| **A1.1.2 Best option for customers** | | | |
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | Yes, we considered spending less and more than the current five year period but selected to remain at the same level |

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|---|---|---|---|
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | The proposed option has been selected balancing the DWI aspiration for a lead free network with the need to keep bills affordable |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | N/A | |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX14 sections 3 and 7.6.3 and WSX15 annex 1 | CRI is a mandatory performance commitment and this programme contributes to our forecast performance |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX14 section 7.6.3 | As this is a continuation of an existing programme the uncertainties relating to costs and benefit delivery are well understood |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | N/A | |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | N/A | |
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | N/A | |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WSX14 section 7.6.3 | This is a continuation of an existing programme and actual costs have been used to develop forecast costs |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | WSX14 section 7.6.3 | Business plan costs have been developed based on the actual cost of schemes delivered under this programme using our internal delivery team. We have a dedicated internal delivery team focussed on our business as usual lead pipe replacement programme. The internal delivery team has a mature and proven track record for |

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| | | | delivering efficiently and innovatively and constantly challenges itself to use new construction methods to deliver safely, to time, cost and quality requirements. Cost efficiency is supported by our supply chain frameworks and supplier/hub arrangements with over 70% of the overall project cost being competitively tendered. |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | N/A | No. |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | N/A | |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | N/A | |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | N/A | |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | WSX26 section 2.4 | Yes, PCDW15 covers lead pipe replacement |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | WSX26 section 2.4 | Yes |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | N/A | |

## 3.2. Security - Cyber

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## 3.3. Analytical laboratory enhancement for PFAS

Our analytical laboratory near Bath is adequately sized to meet the current business sampling needs for wastewater and water supply. With changes in legislation led by our regulators we will see a significant increase in the sampling requirements across the business.

To meet this enhanced sampling requirement and subject to suitable planning requirements we will need to expand our analytical laboratories capacity; including the overall footprint of the building.

### PFAS analysis

Per and Polyfluoroalkyl Substances (PFAS) are not currently a regulated parameter in the United Kingdom but have been the subject of numerous information letters issued by the DWI. The regulations do address these types of chemicals under Regulation 4 (wholesomeness) and the “catch all” aspect of the regulation.

In October of 2021 DWI information letter 05/2021 set out the requirements for companies to submit sample results and summary risk assessment information for 47 PFAS. This letter outlined requirements to regularly submit PFAS sample results through the routine monthly raw water data submissions and makes changes to the tier system reported in PFAS/PFOA Guidance in January 2021.

This was followed by information letter 03/2022 which set out the requirement for companies to have a risk assessment methodology for PFAS compounds and defined a tiered approach with a precautionary guideline value for concentrations of PFAS in water. Information letter 02/2023 clarified the DWI’s expectations regarding water companies AMP8 (2025-2030) strategies for investigating PFAS risk and the trigger levels and actions that will be implemented to mitigate PFAS risk from source to tap. This allowed us to calculate the impact of PFAS sampling at Wessex Water.

As a result of the changing requirements we are expecting to carry out up to 2500 PFAS sample analyses per year, giving around 117,500 parameter results. Analytical capacity and resilience is currently low in the UK with a limited number of service providers and we have experienced delays in sample processing including a complete breakdown restricting all PFAS sampling. To operate in a resilient way we have to consider approaches to future PFAS sampling requirements. It has also been indicated that the number of parameters measured is likely to rise from 47 increasing the analytical load.

### 3.3.1. Laboratory enhancement expenditure assessment criteria

We provide the following table to evidence our compliance with the Final Methodology Appendix 9 – Setting expenditure allowances Section A1.1 Enhancement assessment criteria.

| | Requirement | See section | Comment |
|---|---|---|---|
| **A4.1.2 Need for enhancement investment** | | | |
| A | Is there evidence that the proposed enhancement investment is required (ie there is a quantified problem requiring a step change in service levels)? This includes alignment agreed strategic planning framework or environmental programme where relevant. | WSX15 – A3 1.5 | Legislative changes in sampling requirements |
| B | Is the scale and timing of the investment fully justified, and for statutory deliverables is this validated by appropriate sources (for example in an agreed strategic planning framework)? | WSX15 – A3 1.5 | Legislative changes in sampling requirements |

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|---|---|---|---|
| C | Does the proposed enhancement investment or any part of it overlap with activities to be delivered through base, and where applicable does the company identify the scale of any implicit allowance from base cost models? | WSX15 – A3 1.5 | No. Legislative changes in sampling requirements |
| D | Does the need and/or proposed enhancement investment overlap or duplicate with activities or service levels already funded at previous price reviews (either base or enhancement)? | WSX15 – A3 1.5 | No. Legislative changes in sampling requirements |
| E | Is the need clearly identified in the context of a robust long-term delivery strategy within a defined core adaptive pathway? | WSX15 – A3 1.5 | Legislative changes in sampling requirements |
| F | Where appropriate, is there evidence that customers support the need for investment (including both the scale and timing)? | n/a | n/a |
| G | Is the investment driven by factors outside of management control? Is it clear that steps been taken to control costs and have potential cost savings (eg spend to save) been accounted for? | WSX15 – A3 1.5 | Yes. Legislative changes in sampling requirements |
| **A1.1.2 Best option for customers** | | | |
| A | Has the company considered an appropriate number of options over a range of intervention types (both traditional and non-traditional) to meet the identified need? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| B | Has a robust cost–benefit appraisal been undertaken to select the proposed option? Is there evidence that the proposed solution represents best value for customers, communities and the environment over the long term? Is third-party technical assurance of the analysis provided? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| C | In the best value analysis, has the company fully considered the carbon impact (operational and embedded), natural capital and other benefits that the options can deliver? Has it relied on robustly calculated and trackable benefits when proposing a best value option over a least cost one? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| D | Has the impact (incremental improvement) of the proposed option on the identified need been quantified, including the impact on performance commitments where applicable? | WSX15 – A3 1.5 | Yes |
| E | Have the uncertainties relating to costs and benefit delivery been explored and mitigated? Have flexible, lower risk and modular solutions been assessed – including where forecast option utilisation will be low? | WSX15 – A3 1.5 | Yes. Proposing a larger expansion but only seeking funding to meet the legislative changes. |
| F | Has the scale of forecast third party funding to be secured (where appropriate) been shown to be reliable and appropriate to the activity and outcomes being proposed? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| G | Has the company appropriately considered the scheme to be delivered as Direct Procurement for Customers (DPC) where applicable? | n/a | n/a |

| | | | |
|---|---|---|---|
| H | Where appropriate, have customer views informed the selection of the proposed solution, and have customers been provided sufficient information (including alternatives and its contribution to addressing the need) to have informed views? | n/a | n/a |
| **A1.1.3 Cost efficiency** | | | |
| A | Is it clear how the company has arrived at its option costs? Is there supporting evidence on the calculations and key assumptions used and why these are appropriate? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| B | Is there evidence that the cost estimates are efficient (for example using similar scheme outturn data, industry and/or external cost benchmarking)? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| C | Does the company provide third party assurance for the robustness of the cost estimates? | WSX15 – A3 1.5 | Yes. The assessment of the work required and expansion proposals have been developed by AECOM and Saunders Boston Architects |
| ***Need for enhancement model adjustment*** | | | |
| D | Is there compelling evidence that the additional costs identified are not included in our enhancement model approach? | n/a | n/a |
| E | Is there compelling evidence that the allowances would, in the round, be insufficient to account for evidenced special factors without an enhancement model adjustment? | n/a | n/a |
| F | Is there compelling econometric or engineering evidence that the factor(s) identified would be a material driver of costs? | n/a | n/a |
| **A1.1.4 Customer protection** | | | |
| A | Are customers protected (via a price control deliverable or performance commitment) if the investment is cancelled, delayed or reduced in scope? | n/a | Not material |
| B | Does the protection cover all the benefits proposed to be delivered and funded (eg primary and wider benefits)? | n/a | Not material |
| C | Does the company provide an explanation for how third-party funding or delivery arrangements will work for relevant investments, including how customers are protected against third-party funding risks? | n/a | Not material |

# 4. PCs and PCDs

## 4.1. Overview

We do not have any bespoke PCs for water supply. The following sections detail the PCs and PCDs most relevant to this water network plus price control. See WSX15 Annex A4 for details of some of the recent and future innovations we are adopting to maintain and improve our performance and asset management.

## 4.2. PCs

### 4.2.1. Compliance risk index (CRI)

The Compliance Risk Index is a performance measure designed to illustrate the risk arising from failures to meet drinking water standards for the parameters specified within the regulations throughout the supply system from source to tap. The Index assigns a value to the significance of the failing parameter, the proportion of consumers potentially affected and an assessment of the company's response. Since the introduction of the Index in 2016 Wessex Water have largely been one of the top performing companies and we aspire to continue to maintain and build upon our industry leading performance.

Our strategy to maintain our industry leading performance is based on the continual improvement and development of our existing approach to risk management through Drinking Water Safety Plans (DWSP) and investment management and asset management strategies.

We are not proposing any enhancement expenditure for this PC in AMP8 or AMP9 as we are already delivering industry leading performance, and the maintenance of this position will be through the prioritisation of our capital maintenance funding based on the above approach and strategies.

Our PR19 performance commitment level (PCL) is zero with an underperformance deadband of 2.0. We recognise the DWI view that the target should be zero as we should not plan for any failures, however we suggest a target of 1.5 is a suitable baseline for PR24, slightly tighter than our PR19 underperformance deadband.

### 4.2.2. Customer contacts about water quality (WQC)

Consumer contacts about the appearance, taste and odour of drinking water are reported annually by calendar year to the Drinking Water Inspectorate (DWI) and published each year in the Chief Inspector's report and on the discover water website. This data is used for this common PC and we are committed to further reducing the disruption and other negative social impacts for customers from this issue.

There are three main elements to our strategy to reduce customer contacts about water quality. These are asset management (mains replacement), operational performance (mains conditioning and flushing), and customer relationship management. This approach has delivered a significant reduction in the number of consumer contacts over the last decade, with the three year average of 2.3 contacts per 1000 population in 2013/14 reducing to 1.3 in 2022/23, but there is scope for further improvement to improve our performance in this area.

Black, Brown and Orange contacts form the largest sub-category of the Appearance metric and *we* are one of a several companies that were issued with a DWI Regulation 28(4) Notice in 2021 for the specific purpose of reducing our discolouration (black, brown and orange) customer contacts, both regionally and in specific water quality zones. The Notice requires a reduction in discolouration contacts (compared to 2020 figures) in AMP8.

Therefore we are proposing a significant uplift in capital maintenance base expenditure in AMP8 and beyond to enable the replacement of a number of trunk mains in specific water quality zones to achieve the requirements of our DWI Regulation discolouration 28 Notice. We are also planning to target taste and odour contacts for which we are above the national average.

**Impact of change in PC definition**

As per the PR24 Performance commitment definition - Customer contacts about water quality the PC definition has changed from that used at PR19. The PR19 PC is based on DWI Information Letter DWI IL01/2006, whereas the PR24 PC is based on DWI IL04-2022_Revised_Annual_Consumer_Contacts.

Under the old definition each contact counted as one, even if the customer reported more than one issue, the one contact was recorded against the primary issue. Under the new definition if the customer complaints about multiple issues, both the appearance and the taste for example, these are logged at two contact one for each issue.

We have been shadow reporting against this new definition since January 2023 and used the data up to the end of June 2023 to estimate the impact of this change which is a 22% increase in Taste & Odour contacts and a 12% increase in appearance (discolouration). See our commentary to the Outcomes tables for further details, which includes the following tables.

*Table 7 – Historical performance and targets*

| Table heading | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|---|---|---|---|---|---|---|---|---|---|
| PC target | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Performance from base expenditure **Reported PR19 definition** | 2.26 | 2.31 | 2.24 | 2.25 | 1.79 | 1.59 | 1.47 | 1.47 | 1.53 |
| Performance from base expenditure **Rebaselined PR24 definition** | 2.60 | 2.67 | 2.57 | 2.59 | 2.07 | 1.83 | 1.70 | 1.69 | 1.75 |
| Overall performance | 2.60 | 2.67 | 2.57 | 2.59 | 2.07 | 1.83 | 1.70 | 1.69 | 1.75 |

*Table 8 – Current performance – PR24 methodology*

| Table heading | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|---|---|---|---|---|---|
| PR19 target | n/a | n/a | n/a | n/a | n/a |
| Performance from base expenditure | 1.64 | 1.35 | 1.31 | 1.29 | 1.27 |
| Performance from enhanced expenditure | 0 | 0 | 0 | 0 | 0 |
| Overall actual performance | 1.64 | 1.35 | 1.31 | | |
| Forecast overall performance | | | | 1.29 | 1.27 |

Current performance using the new definition is shown in Table 8.

We have continued to drive down the number of contacts in recent years through a combination of activities including :

- Undertaking root cause analysis to better understand underlying reasons and find appropriate solutions
- Optimising Water Treatment Works performance to minimise aggressivity/corrosivity of water into supply and undertaking Water conditioning using sodium silicate for a small number of high risk areas
- Undertaking works at Service Reservoirs to minimise the risk of discoloured water entering the network
- Using PODDS (Prediction Of Discolouration in Distribution Systems) to design mains conditioning schemes
- Implementing a Calm network strategy including staff training, changing standpipe hire arrangements, Fire and rescue service engagement and transient (surge) pressure monitoring and management
- Improving our Supply Risk Assessment and Method Statement (SRAMS) process to minimise network disturbance
- Optimising our routine water mains flushing programme
- Enhancing our proactive communication with customers over both possible discolouration linked to planned works, and more recently to reactive issues
- Continuation of our business as usual Mains replacement/rehabilitation programme including service pipe replacement where appropriate

Our proposed baseline is to maintain a downward trend per year as shown below.

*Table 9 Proposed baseline*

| | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
|---|---|---|---|---|---|
| Proposed baseline | 1.25 | 1.23 | 1.21 | 1.19 | 1.17 |

As noted previously, in order to meet the requirements of our DWI Regulation 28(4) Notice for reducing our discolouration (black, brown and orange) customer contacts we are proposing a significant uplift in capital maintenance base expenditure in AMP8 and beyond, in particular in targeting the replacement of a number of trunk mains in specific water quality zones.

Our long-term aspiration is to achieve a performance commitment level of 0.68 in 2050.

### 4.2.3. Water supply interruptions (WSI)

The purpose of this common performance commitment is to incentivise companies to minimise the number and duration of supply interruptions. This is an existing PR19 mandatory PC with a common reporting methodology, and there has been no material changes to the definition for PR24

We have consistently reduced supply interruptions down to deliver Industry leading Water and Sewerage Company (WASC) performance.

We have set ourselves the stretching aspirational target of Zero interruptions of longer than three hours by the year 2050. As detailed in our Long Term Delivery Strategy we are planning to retain our current level of performance in 2025-2030 and 2030 -2035, and to gradually reduce to zero thereafter once new technology and innovation makes this affordable. Hence no enhancement expenditure is proposed in this five year period for WSI.

The sustained lower level of supply interruptions in the last three years is a result of continual improvement in our processes and procedures and investment in new ways of working and new equipment. Improvements have included:

- Reducing planned interruptions to effectively zero through the business as usual use of line stopping and other under pressure techniques to undertake almost all planned works without an interruption. On mains renewal schemes this can limit the techniques employed and it is perhaps worth a wider debate in the industry over costs and inconvenience and what serves our customers best. On most mains renewal schemes where necessary we utilise temporary overland pipework to keep customer supply interruptions to less than 3 hours, this does come with a significant cost impact.
- Network response coordinators (NRC): this is the most important initiative put in place for unplanned interruptions and most of the following other initiatives will be less effective if not supported by the NRC's. We now have six people supporting a 24/7 365 dedicated supply interruptions controller in our control room with full access to all company systems to support the people in the field. This enables us to best use of the "golden first hour" of any event.
- Network infusion: where rezoning of the distribution system cannot get all customers back in supply, network infusion can achieve this. Early call out of resources is key to the success of this initiative but will mean that they are often stood down without being used. We now have a pool of tankers with appropriate ancillary equipment ready to go at short notice to provide the best chance of maintain supplies to customers who otherwise would remain out of supply if no rezone option is available.
- Real time data: We are still installing even more additional pressure monitoring in key locations across our network so that we can become aware of a service failure almost immediately and this gives us the facility to react faster to restore supplies.
- Increased equipment: we have purchased additional equipment to reduce interruptions. This includes line stopping kits, standpipes that allow infusion through a loose jumper hydrant and pressure loggers for inspectors to deploy during an incident.
- Awareness and cultural change: staff are aware of the changing focus from "repair the failure as quickly as possible", to "how do we get customers back in supply as quickly as possible and then deal with the permanent repair".

We plan to continue to utilise these strategies to maintain current performance over AMP8 and AMP9, and thereafter make use of advances in detection technology to make a further step change reduction on our path to zero supply interruptions greater than 3 hours by 2050.

Considering our current industry leading performance and that we are not asking for any enhancement funding for supply interruptions at PR24 we propose a PR24 PCL equal to the end of AMP7 PCL of 5 minutes.

### 4.2.4. Leakage (LEA)

In response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods we have scaled back our proposed leakage reduction and smart metering programmes from that just proposed in our revised WRMP. Our forecast leakage reduction in AMP8 has reduced from 7.6Ml/d to 3.5Ml/d, and our smart metering target from 75% of properties (HH & NHH) smart metered by 2030 to 40%. Our forecast leakage reduction in AMP8 is shown below.

*Table 10 – Revised Leakage reduction*

| Cumulative reduction | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
|---|---|---|---|---|---|
| Distribution losses (Ml/d) | 0.40 | 0.80 | 1.20 | 1.59 | 1.99 |
| Customer losses (Ml//d) | 0.06 | 0.24 | 0.55 | 0.97 | 1.51 |
| Total leakage (Ml/d) | 0.46 | 1.04 | 1.75 | 2.56 | 3.50 |

The PC is defined as the percentage reduction of three year average leakage in Ml/d from the 2019-20 baseline, which is fixed at 73.3Ml.d, however our leakage performance in 23/24 and 24/25 is not fixed. For the avoidance of doubt we provide the following underlying data for our PCL.

*Table 11 – Historical reported in year and three-year average Leakage figures and percentage reduction from the 2019-20 three-year average baseline, highlighted in red.*

| | Units | AMP6 | | | AMP7 | | |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Baseline Leakage (in year) | Ml/d | 76.5 | 75.6 | 67.90 | 65.10 | 63.30 | 71.20 |
| Three-year average Leakage - baseline | Ml/d | | | 73.33 | 69.53 | 65.43 | 66.53 |
| % Reduction from 2019-20 baseline - baseline | % | | | | 5.2% | 10.8% | 9.3% |

*Table 12 – Revised forecast leakage reduction*

| | Units | *AMP6* | AMP7 | | AMP8 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *2019-20* | 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
| Total Leakage (in year) | Ml/d | 67.90 | 63.48 | 63.79 | 63.33 | 62.75 | 62.04 | 61.23 | 60.29 |
| Three-year average Leakage | Ml/d | 73.33 | 65.99 | 66.16 | 63.53 | 63.29 | 62.71 | 62.01 | 61.19 |
| % Reduction from 2019-20 baseline - final plan | % | | 10.0% | 9.8% | 13.4% | 13.7% | 14.5% | 15.4% | 16.6% |

The reduction in distribution losses will be delivered by an integrated strategy involving increased activity in a number of areas including pressure management, active leakage control and data and systems improvements together with new initiatives on trunk mains and a new programme of leakage driven asset renewal as detailed in our PR24 CW19 Demand management - Leakage expenditure and activities data table and commentary.

The reduction in customer losses will be delivered through our proposed smart metering strategy, where the total number of customer supply pipe leaks repaired each year will not materially change but the ‘leak run times’ of the bigger customer side leaks will be reduced significantly. Smart meter data will also allow prioritisation of supply pipe leak repairs based on measured flows, so in the same number of fixes a greater overall saving can be achieved.

### 4.2.5. Per capita consumption (PCC) and Business demand (NHH)

These performance commitments are designed to incentivise companies to help customers and business reduce their consumption to benefit our long term water resources supply/demand balance and reduce need for water abstraction.

Our strategy to achieve our proposed AMP8 targets is a combination of our smart metering and water efficiency strategy as detailed in the Demand Management Strategy in WSX15.

The PCC PR24 performance commitment is a measure of the percentage reduction of three-year average PCC in litres per person per day (l/person/d) from the 2019-20 three-year average baseline. Three-year average values are calculated from annual average values for the reporting year and two preceding years expressed in l/person/d.

The reported in year and three-year average figures from 2017-18 to 2022-23 are displayed in Table 13. The 2019-20 three-year average baseline figure is 137.83 l/person/d. So far in AMP7, the three-year average PCC has been increasing from the baseline which is attributed to the impacts on household water use in 2020-21 and 2021-22 from the Covid-19 pandemic. The 2022-23 in year PCC saw a reduction from the previous year and has returned to a level comparable to those seen in AMP6. Although working patterns have changed since before the pandemic, with more people now working from home for at least part of the week, the overall number of home-workers has declined since the height of the pandemic in 2020/21. In addition, the cost-of-living crisis and particularly increasing energy bills since September 2022 has resulted in customers making behavioural changes to reduce their use of water and especially hot water.

*Table 13 – Historic reported PCC and reduction from the 2019-20 three-year average baseline, highlighted in red.*

| | Units | AMP6 | | | AMP7 | | |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Baseline PCC (in year) | l/h/d | 135.9 | 139.3 | 138.3 | 151.8 | 144.9 | 138.8 |
| Three-year average PCC – baseline | l/h/d | | | 137.8 | 143.1 | 145.0 | 145.2 |
| % Reduction from 2019-20 baseline - baseline | % | | | | -3.9% | -5.2% | -5.3% |

The forecasted figures from 2023-24 onwards, Table 14, are derived from the WRMP24 final planning Table 3c – DYAA Final Plan and have been adjusted for the NYAA scenario. The forecasted final plan percentage reduction in the three-year average PCC at the end of AMP8 is 2.3%, 134.7 l/person/d.

The worst-case scenario (P10) is the average of the DYAA and NYAA high PCC scenarios minus the difference between the baseline and final plan three-year average. This results in a three-year average PCC of 142.9 l/person/d at the end of AMP8. The best-case scenario (P90) is the NYAA low scenario PCC minus the difference between the baseline and final plan three-year average. This results in a three-year average PCC of 124.2 l/person/d at the end of AMP8.

*Table 14 – Forecast PCC figures from the baseline and final WRMP24 plan.*

| | Units | *AMP6* | AMP7 | | AMP8 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *2019-20* | 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
| Final Plan PCC (in year) | l/h/d | *138.3* | 140.8 | 140.8 | 140.0 | 138.2 | 136.6 | 135.0 | 133.5 |
| Three-year average PCC - final plan | l/h/d | *137.8* | 141.5 | 140.1 | 140.5 | 139.6 | 138.2 | 136.6 | 135.0 |
| % Reduction from 2019-20 baseline - final plan | % | | -2.7% | -1.7% | -1.9% | -1.3% | -0.3% | 0.9% | 2.0% |

The PR24 Business demand performance commitment is a measure of the percentage reduction of three-year average business demand in Ml/d from the 2019-20 baseline. Although we currently report this data as part of the Annual Performance Report, this is a new performance commitment for AMP8.

The reported in year and three-year average figures from 2017-18 to 2022-23 are displayed in Table 15. The 2019-20 three-year average baseline figure is 81.57 Ml/d. So far in AMP7, the three-year average has declined but in year values in 2021-22 and 2022-23 have increased since 2020-21. This can be attributed to a significant reduction in 2020-21 as a result of the Covid-19 pandemic, and the steady increase over the last two years reflects the return of workers and customers to businesses.

*Table 15 – Historical reported in year and three-year average Business demand figures and percentage reduction from the 2019-20 three-year average baseline, highlighted in red.*

| | Units | AMP6 | | | AMP7 | | |
|---|---|---|---|---|---|---|---|
| | | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Baseline Business demand (in year) | Ml/d | 81.86 | 83.8 | 79.06 | 70.61 | 74.63 | 78.00 |
| Three-year average Business demand - baseline | Ml/d | | | 81.57 | 77.82 | 74.77 | 74.41 |
| % Reduction from 2019-20 baseline - baseline | % | | | | 4.6% | 8.3% | 8.8% |

The forecasted figures from 2023-24 onwards, Table 16, are derived from the WRMP24 final planning Table 3c – DYAA Final Plan and adjusted for the NYAA scenario. The forecasted final plan percentage reduction in the three-year average Business demand at the end of AMP8 is 11.0%, 72.64 Ml/d.

The worst-case scenario (P10) is the sum of the average of the DYAA and NYAA high non-household consumption scenarios and a 1Ml/d conservative estimate for large new users in the region, minus the difference between the baseline and final plan three-year average. This results in a three-year average Business demand value of 83.5 Ml/d at the end of AMP8. The best-case scenario (P90) is NYAA low scenario non-household consumption minus the difference between the baseline and final plan three-year average. This results in a three-year average Business demand value of 69.8 Ml/d at the end of AMP8.

*Table 16 – Baseline 2019-20 and forecasted in-year and three-year average Business demand figures from the baseline and final WRMP24 plan, the percentage reduction from the 2019-20 three-year average baseline for both baseline and final plan and the best- and worst-case*

| | Units | *AMP6* | AMP7 | | AMP8 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *2019-20* | 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 |
| Final Plan Business demand (in year) | Ml/d | 79.06 | 78.98 | 78.77 | 77.91 | 76.47 | 75.02 | 73.76 | 72.53 |
| Three-year average | Ml/d | 81.57 | 77.20 | 78.58 | 78.55 | 77.72 | 76.46 | 75.08 | 73.77 |
| % Reduction from 2019-20 baseline | % | | 5.4% | 3.7% | 3.7% | 4.7% | 6.3% | 8.0% | 9.6% |

Our long-term ambition for Business Demand is a 15% reduction from 2019-20 baseline by the year 2050.

### 4.2.6. Mains repairs (MRP)

The purpose of this common performance commitment is to incentivise companies to maintain and improve the asset health of the below ground water mains network and demonstrate their commitment to its long term asset stewardship for the benefit of current and future generations. Our current performance is shown below.

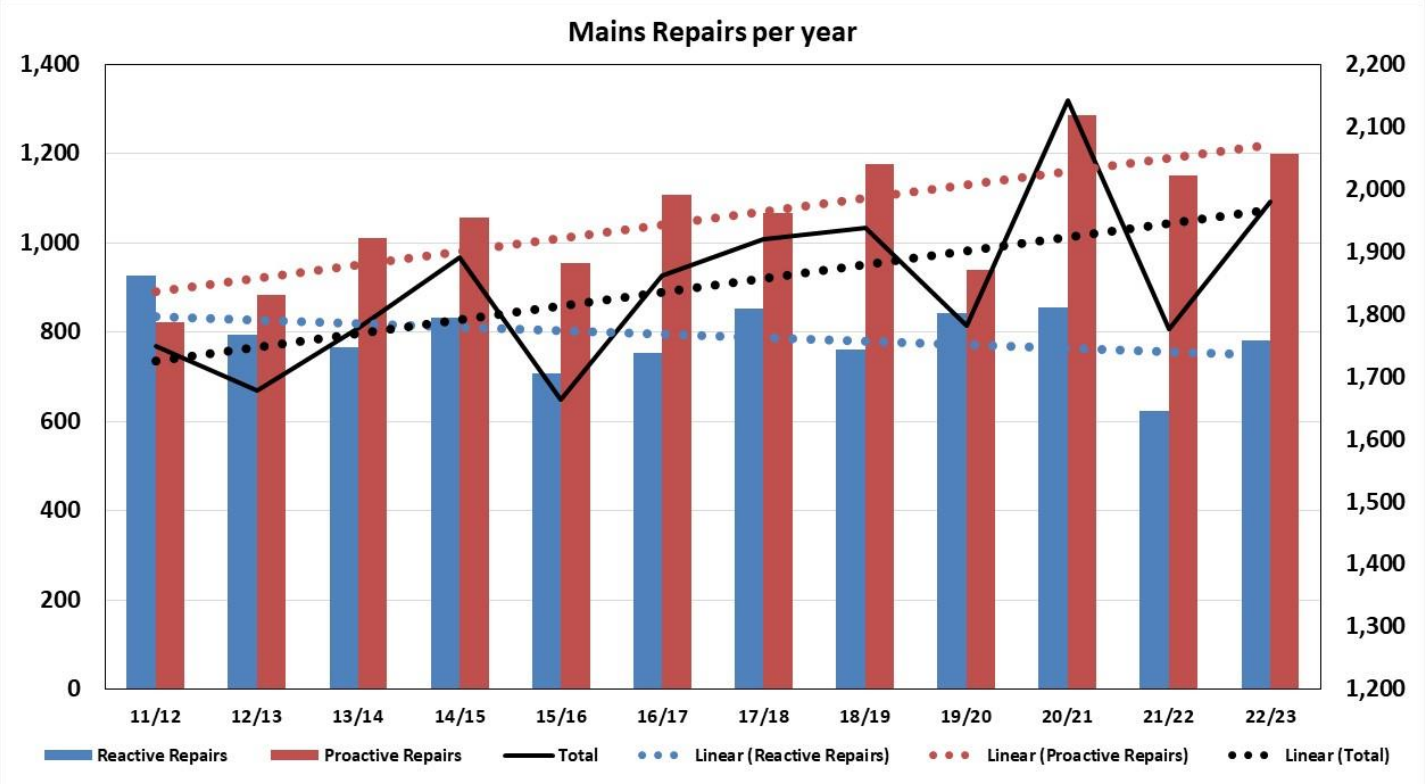
Table *17* – PR19 target and performance

| Table heading | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|---|---|---|---|---|---|
| PR19 target | 161.4 | 159.1 | 156.9 | 154.6 | 152.4 |
| Actual/forecast performance | 177.7 | 147.1 | 163.5 | 164.0 | 164.7 |

We did not agree with the PR19 target enforced on us; in particular that it did not reflect the increase in proactive (detected) repairs needed to meet our leakage reduction target as detailed in our PR19 business plan Appendix 14 - The link between leakage and bursts.

As shown below our historic data shows that as we have reduced leakage over the last ten year the number of reactive repairs has reduced and the number of proactive repairs has increased as have the total number of repairs. Leakage has been driven down lower and lower through a number of policies and strategies; of which increased Active Leakage Control (ALC) has been central, ie employing more and more leakage inspectors to go out and detect more and more leaks.

*Figure 7* - Proactive and Reactive mains repairs over time




We have driven down the three year average leakage from 79.3Ml/d in 2011/12 to 66.5Ml/d in 2022/23.

Hence this increase in repairs is mainly as a direct result of least cost short term actions to meet leakage reduction targets and not solely indicative of an underlying deterioration of asset health.

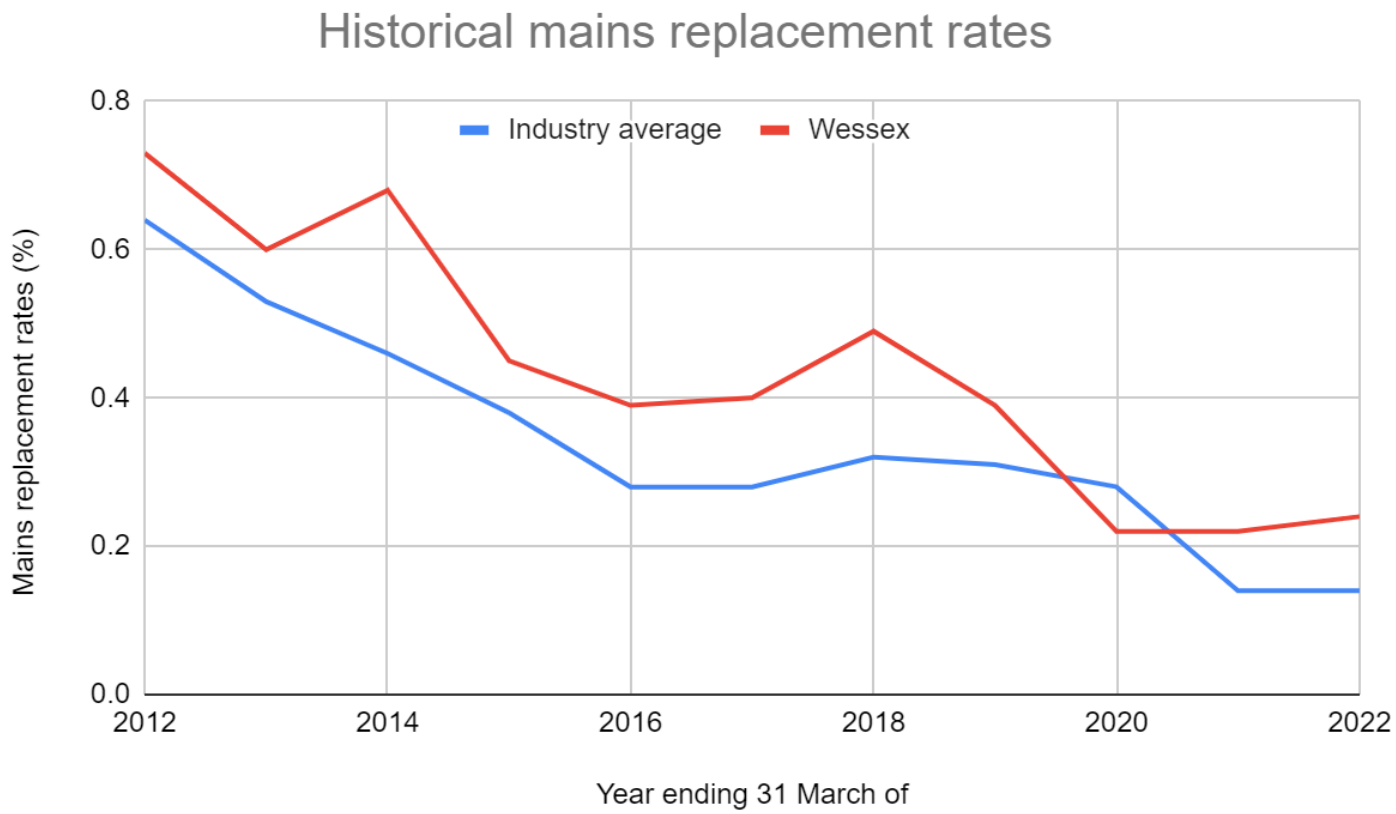
As shown in the Table below taken from our PR24 Table CW20 Water main asset condition data commentary we have seen a material deterioration in asset condition that cannot alone be explained by the above leakage reduction explanatory factor.

*Table 18 – Comparison between PR24 and PR09*

| | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---|---|---|---|---|---|
| PR24 Potable mains total (%) | 53.5% | 24.1% | 18.7% | 3.4% | 0.3% |
| PR09 Potable mains total (%) | 57.0% | 31.6% | 10.0% | 1.3% | 0.1% |

As Ofwat has noted in Appendix 9 of the PR24 final methodology, the rate at which potable water mains have been replaced has fallen in recent years compared to levels seen earlier across the industry. The chart below shows industry average mains replacement rates since 2011/12 and compares this to Wessex Water's own replacement rates over that period.

*Figure 8 – Historical mains replacement rates across the industry*




We believe that the current low mains replacement rates are neither sustainable nor in the long-term interests of customers. This view is supported by industry-wide studies that considered this matter. A study undertaken for UKWIR in 2017 found that if the industry-wide mains replacement activity were to continue at the levels seen in 2016/17, there would be significant negative outcomes for customers and the environment by 2050.

We acknowledge that it may be possible to continue with the current low replacement rates in the near term, and focus on delivering outcomes that Ofwat has prioritised through its performance commitment framework (e.g. leakage and supply interruptions) through less capital intensive measures. However, we do not think that this is the long-term efficient approach for our customers.

Continuing with the current mains replacement activity with a view to increasing it in future AMPs would likely require much steeper increases in replacement rates to avoid the negative outcomes identified in the UKWIR report by 2050. This could lead to higher unit costs and deliverability issues as companies across England and Wales seek to do the same. It is far from clear that the risks to outcomes identified in the UKWIR report can actually be mitigated through remedial action when problems start to emerge. There are risks of adverse impacts on customer and environmental outcomes in the future, including risks of harm to customer trust in the industry and regulatory framework.

We believe that a more efficient approach, which is in the long-term interests of customers, would be to start to increase mains replacement rates in AMP8 and maintain higher rates going forward.

We are proposing a cost adjustment claim to base maintenance for this issue, see WSX09 - Annexes - Base cost adjustment claims include CAC2 – Mains replacement costs for further details.

We are proposing an increase to 0.4% per annum in AMP8, with a possible increase to 0.6% per annum in AMP9 with the long term sustainable level likely to be between 0.8% and 1.0%.

Based on the above strategy, and meeting long term expectations to further reduce leakage, we anticipate mains repairs stabilising over the long term at just under 180 repairs per 1000km of mains per year as detailed in our long term delivery strategy (LTDS). Our proposed PCL is shown below and is based on an increase in repairs needed to meet our leakage reduction target given that our proposed increase in proactive mains replacement will not have a material impact within the next five year period.

*Table 19 – Proposed performance commitment level*

| Repairs/1000km/yr | 2029-30 | 2034-35 | 2039-40 | 2044-45 | 2049-50 |
|---|---|---|---|---|---|
| Performance from base expenditure | 168.8 | 170.4 | 170.8 | 171.1 | 171.4 |

### 4.2.7. Unplanned outage (UNO)

The purpose of the unplanned outage performance commitment is to incentivise the company to appropriately maintain and improve the asset health of our above ground supply production assets.

Unplanned outage is an existing AMP7 PC, however there will be one major change in PR24.

The PR19 methodology for unplanned outage excluded outages as a result of raw water quality. We think this was appropriate as the purpose of the measure was to quantify the asset health of our supply production assets. The PR24 definition removes the exclusion for raw water quality outages. We have said that raw water quality events should continue as an exclusion for the PR24 performance commitment definition. If raw water quality is not excluded, we would expect the performance commitment level to be based on back calculated data that includes the impact of raw water quality events.

The purpose of ODI's is to align the interests of companies and their investors with the interests of customers and the environment by directly linking performance with expected financial returns. In addition, the interests of companies, customers and the environment should be achieved in the context of best value for all parties. In the case of unplanned outage, there is minimal to no environmental impact and customers interests predominantly

relate to supply interruptions. To ensure all parties interests are met, we have reviewed the best value options and chosen to invest in our network to ensure customers are not impacted by unplanned outages at water treatment centres. As such, we expect the ODI for this performance commitment to be zero. This supports the approach we have been proposing for the past two years to focus on outcomes and the customer and environmental service impacts of our activities as any impact to customers is captured elsewhere and we do not expect to be penalised for applying best value principles.

Hence we are not proposing any specific investment in AMP8 explicitly directed towards this PC, and plan to maintain our current position through the prioritisation of our capital maintenance funding based on the above approach and strategies.

## 4.3. PCDs

Price Control Deliverables (PCDs) have been introduced by Ofwat as part of the PR24 process as an additional mechanism to performance commitments (PCs) to protect customers from non-delivery of large programmes of work. Should a company fail to deliver all or part of a programme, or delivery within an AMP is delayed, customers should be recompensed for, as a minimum, the financial value of the works (with consideration also given to additional benefits that may have also been realised had the programme been delivered).

We have proposed five PCDs associated with our Water networks plus strategy, specifically in relation to the following:

- Leakage reduction
- Smart metering rollout
- Lead pipe replacement;
- Addressing raw water quality deterioration; and
- Cyber security

Further details of these PCDs, including the proposed payment rates that would apply in the event of under-delivery or non-delivery in these areas, are set out in WSX26 (Section 2).

# 5. Raw water transport & storage

## 5.1. Raw water transport

We do not have many assets that fall within these price control sub-category, and are not proposing any enhancement expenditure in this area. Our investment strategy over the next five years can be described as business as usual reactive and proactive like for like replacement as and when required.

As shown in PR24 Table CW4 we only have two raw water transport stations with a total capacity of 55kW and are not forecasting any change over the five year period. We are forecasting a very small increase in raw water transport mains over the five year derived from the trend reported in the APR over the last three years, which is mainly as a result of pipework diversions for treatment improvement projects.

We only have one raw water transport export, from Wessex Water to Bristol Water, and we do not forecast any material changes for the foreseeable future.

## 5.2. Raw water storage

We do not have any assets in this price review sub-category.

## 5.3. Strategic Resource Options

The Strategic Resource Options (SROs) may result in new raw water transport & storage assets being created, although these will not be delivered until AMP9 at the earliest, and, in the case of the Bristol reservoir SRO, are unlikely to be vested as Wessex Water assets as they will not be within our supply area.

A noted previously all of the cost of the appraisal of these SROs in the AMP8 period is being allocated to the water resources price control.

# 6. Water treatment

## 6.1. Overview

At present we have 64 Water Treatment Works in service. Our five surface works provide around 25% of our total supply with the rest from our groundwater sources. We currently do not have any artificial recharge (AR), aquifer storage and recovery (ASR), saline abstractions or water reuse schemes.

The only enhancement expenditure planned in this price control sub-category is the proposed nitrate treatment plant at the site WxW_SS131 as detailed in WSX15 - Water networks plus strategy and investment Annex 1.

We will continue to implement our drinking water safety plan approach to prioritise and proactively maintain our water treatment works using the latest technology and innovation where appropriate to maintain excellent quality drinking water into the future. Our design standards are evolving to meet the latest regulatory expectations for disinfection.

See WSX15 Annex A4 for details of some of the recent and future innovations we are adopting to maintain and improve our performance and asset management, in particular AI for algal growth monitoring for the management of our surface water treatment works.

### 6.1.1. Disinfection policy and raw water categorisation

We have now introduced a significant change in the way we categorise raw water to determine the disinfection requirements: in line with the WHO methodology, sources will now be categorised based on *E. coli* detections. Our design standards for disinfection have also been updated, meaning that and even our lowest risk sites will require some contact time, when we have previously accepted marginal chlorination as a method of disinfection.

The scope of the work required to become fully compliant with the new approach is substantial and will not be achieved within a single AMP cycle, so we are planning to run the two disinfection policies and raw water categorisation methods in parallel as we transition to the new disinfection policy. It is important to note that water treatment centres that would not immediately be compliant with the new approach are not ‘failing’ and do not pose a public health risk. Any sites where a change in raw water quality is identified will have the risk recorded in the DWSP and be prioritised for investment based on risk. The phased move to the alternative approach simplifies of our current approach and moves away from the acceptance of marginal chlorination as a method of disinfection.

## 6.2. Surface water works

### 6.2.1. Asset Inventory

Our five surface water works are described in the following table.

*Table 20 – Surface water works descriptions*

✂

### 6.2.2. Current performance & issues

All of our surface water treatment works are performing well, providing good quality water as demonstrated by our consistently low CRI score, but all require continual investment to ensure their reliability and maintain this performance. ✂. The remaining issues detailed below can be described as business as usual continual investment to maintain and improve our surface water assets and will be prioritised through our investment management process described previously.

*Table 21 – Surface water works issues*

✂

### 6.2.3. ✂

### 6.2.4. Raw water quality and efficacy of treatment

Raw water quality is less of a risk to our surface water treatment sites as we have multistage treatment in place and our proactive catchment management approach mitigates the risks of raw water deterioration.

Our catchment management strategy brings together:

- Operational scientists and hydrogeologists who continually review raw water data and trends to identify any changes and respond accordingly,
- Catchment scientists monitoring our drinking water source protection areas and wider catchments to assess risks to raw water quality, and to direct our agricultural advisers and pesticide specialist who work with farmers and landowners, providing advice and training and where appropriate financial support,
- Collaboration with the Environment Agency in the management of our catchments

See WSX12 - Water resources strategy and investment for further details on the detail of our catchment management strategy and activities.

We know that we can control pesticides through active catchment engagement, as demonstrated with Metaldehyde, which was banned in 2020, and was very stable in water and also very difficult to remove through standard treatment. It was detected at significant levels in some of our reservoirs. The solution was to educate the catchment farmers and offer them a subsidy to switch from metaldehyde to an alternative slug pellet. This action helped us to remove metaldehyde from our vulnerable catchments long before it was banned.

Our pesticide specialist will continue to work closely with farmers, academics and agri-chemical companies to understand pesticide usage trends to better predict when problems may occur on a catchment by catchment basis. This work has avoided the need for any additional treatment to remove pesticides in recent years and we anticipate that this will continue going forwards.

Under PR24 we are going to develop our ability to predict potential pesticide issues across our region. This will be an evolution of work already ongoing whereby our pesticide specialist will engage with stakeholders including catchment farmers, agri-chemical distributors and other partners in agriculture to identify developing trends in land use and cropping.

Nitrate is currently not a major risk at any our surface water sites.

Perfluoroalkyl and Polyfluoroalkyl (PFAS) substances are an emerging raw water quality risk due to their persistent, toxic and bioaccumulative properties. IL 05/2021 and IL 03/2022 set out the requirements for water companies in terms of monitoring and risk assessment. In response, we have developed and implemented a risk-based monitoring strategy for 48 PFAS and are undertaking detailed catchment risk assessments in relation to potential sources of PFAS. We have produced and submitted an AMP8 PFAS strategy to the DWI.

Sites WxW_SS6 and WxW_SS51 have Ultraviolet (UV) in place for cryptosporidium, and although our current risk assessment indicates it is not required at our other 3 surface water sites our long term vision is to move UV for primary disinfection at all our sites over the long term as it also reduces the cryptosporidium risk.

## 6.3. Groundwater works

### 6.3.1. Asset Inventory

We have 59 groundwater treatment sites, most of which are supplied from on site boreholes, although are supplied from satellite raw water sites and we still have 8 treatment sites fed at least in part from spring sources.

We have a large number of water treatment sites for a company of our size, ie with less than 650,000 connected properties. This is a legacy issue arising from the hydrogeology of our area which allowed a large number of small local sources being developed over time. Our largest groundwater site capacity is 28Ml/d, as shown below we have a large number of smaller sites, with half our sites being under 6Ml/d capacity.

*Table 22 – Groundwater treatment sites capacity breakdown*

| Max Production Capacity (Ml/d) | < 1 Ml | 1 to < 3 | 3 to < 10 | 10 to < 20 | > 20 |
|---|---|---|---|---|---|
| Groundwater treatment sites (Nr) | 6 | 15 | 19 | 15 | 4 |
| % | 10% | 25.5% | 32% | 25.5% | 7% |

Many of our groundwater sites abstract water from pristine highly protected chalk aquifers and therefore have not required more than marginal chlorination to provide compliant water. As shown below almost half of all sites have Simple Disinfection (SD) only. Most of the W1 sites have filtration for iron and/or turbidity. The W2 sites have contact tanks. The W4 sites have UV or membranes for crypto protection or nitrate treatment. The W5 sites have two or more of the aforementioned treatment stages.

*Table 23 – Groundwater treatment sites complexity breakdown*

| | SD | W1 | W2 | W3 | W4 | W5 | W6 |
|---|---|---|---|---|---|---|---|
| Sites | 26 | 10 | 5 | 0 | 15 | 3 | 0 |

### 6.3.2. Current performance & issues

Whilst we provide customers with a reliable high quality water supply we do manage a number of risks and issues.

Raw water quality deterioration is a considerable risk to our operational resilience, from both a quality and quantity perspective. Raw water quality is likely to change as a result of climate change and more frequent extreme weather events, however the extent of the challenge posed remains uncertain. The specific parameters that might be affected are difficult to predict but agro-chemicals (pesticides and nutrients), nitrates and turbidity are the most likely.

As noted previously our catchment management strategy brings together:

- Operational scientists and hydrogeologists who continually review raw water data and trends to identify any changes and respond accordingly,
- Catchment scientists monitoring our drinking water source protection areas and wider catchments to assess risks to raw water quality, and to direct our agricultural advisers and pesticide specialist who work with farmers and landowners, providing advice and training and where appropriate financial support,
- Collaboration with the Environment Agency in the management of our catchments

See WSX12 - Water resources strategy and investment for further details on the detail of our catchment management strategy and activities.

Pesticides are an issue in groundwater sources, and our strategy is based on proactive catchment management to hopefully avoid the need for installing additional treatment. We have no plans to install new permanent pesticide treatment in AMP8, however previous experience has shown that deployment of temporary treatment can be a viable option for the short to medium term if required.

Nitrate concentrations in groundwater from historical and recent agricultural activity continue to present a significant water quality risk.

Catchment management forms a fundamental part of our source to tap approach to managing nitrate in water supplies. Much progress has been made in managing the nitrate risks in many sources. Where catchment management alone has not resulted in significant enough reduction in nitrate concentrations, we have instigated source substitution and/or blending solutions, with treatment solutions only considered as a last resort.

Detailed nitrate trend modelling across Wessex Water's sources, previously undertaken in 2013, was reviewed in 2020/21. Some issues were identified that meant that some sources were not modelled as accurately as others. As a result, the model was updated to ensure that all the models were as robust as possible. The revised 2020/21 modelling suggested that at some sources where the trend was previously shown to be stabilising were actually still rising, or only just peaking. As a result of these findings, we are committing to reviewing and undertaking nitrate modelling for all sources on a biannual basis, to better inform the future risk profile and predict the potential future interventions that may be required to mitigate the risk.

The latest modelling data has led us to propose the installation of ion exchange treatment at one strategic site, ✂, as all other avenues have been exhausted and the revised modelling data suggests concentrations may not have peaked and will subsequently not start reducing for a significant period.

Enhanced catchment management is being proposed at eleven high risk sources ✂ for 2025-2030 to attempt to influence the nitrate trends. Whilst this might not be enough to remove the need for treatment, the aim of it is to minimise the level of treatment required.

Our LTDS core pathway assumes no further nitrate treatment is required, however we have an alternative pathway with significant further nitrate treatment being required.

Perfluoroalkyl and Polyfluoroalkyl (PFAS) substances are an emerging raw water quality risk due to their persistent, toxic and bioaccumulative properties. IL 05/2021 and IL 03/2022 set out the requirements for water companies in terms of monitoring and risk assessment. In response, we have developed and implemented a risk-based monitoring strategy for 48 PFAS and are undertaking detailed catchment risk assessments in relation to potential sources of PFAS. We have produced and submitted an AMP8 PFAS strategy to the DWI.

At the time of writing, with the sample results and risk assessments available, we have identified 32 sites which fall into tier 2, medium risk. We have no sites in tier 3 however we have had a high risk, tier 3, result from one of our sources. We are engaging with DWI, UKHSA and Local Authorities with regards to these sites and have enhanced monitoring in place.

Blending is a viable option for PFAS in certain circumstances and GAC is a viable treatment option. Although we conclude that long term investment in treatment practices is not currently required to mitigate the risk of PFAS, we will continue to review our options for control measures should a site meet the tier 3 requirements so that control measures may be implemented as quickly as possible if necessary.

**Cryptosporidium**

In recent years we have installed Ultraviolet (UV) treatment at five sites ✂ to provide cryptosporidium protection.

The change to our disinfection policy to allow UV irradiation for primary disinfection has promoted a step change in our approach, and since the policy change, where appropriate our disinfection related schemes have utilised this method of disinfection, giving the dual benefit of Cryptosporidium treatment and disinfection, while reducing chemical dosing.

As part of our Cryptosporidium risk reduction strategy, we have purchased several containerised pairs of UV reactors, which are held in a central store and could be installed at short notice should an elevated risk occur in a raw source where protection is not currently in place. The variation in sizes of the units means they can be installed in configurations appropriate for various flow rates and outputs and are therefore potentially suitable for our critical Water Treatment Centres which would otherwise be difficult to remove from supply.

We will continue to review risk and treatment requirements on a site-by-site basis through our DWSP process, the output of which goes through our monthly drinking water compliance and risk meeting and is reported up to our Board to provide visibility and involvement in the setting and decisions about managing the risk of Cryptosporidium.

Our long term vision is to move UV for primary disinfection at all our sites.

## 6.4. Water conditioning

We currently use silicate dosing to manage discolouration in the short to medium term in one area fed from site WxW_SS89. Sodium silicate is tasteless and odourless in water and has no detrimental environmental effects. The initial effect of sodium silicate dosing is to sequester any iron in the water. This means that the iron remains in solution and is undetectable by visual inspection. Sodium silicate is known to work by forming a thin film over the corroded metal surface. Once the protective film is established on the inside of the pipe further corrosion is inhibited. Film depth is understood not to develop beyond the initial layer, even with higher dose rates. Case studies report that films break down rapidly when dosing ceases. The use of sodium silicate provides simultaneous increase in pH and scale formation.

We are considering one further silicate dosing installation to manage discolouration in the short to medium term as a trial to assess its effectiveness.

We also need to assess the effectiveness of undertaking further water conditioning at sites WxW_SS89 and WxW_SS62 to minimise the aggressivity of the water being supplied.

## 6.5. Strategy and investment

We are not proposing building any completely new water treatment sites in AMP8, or in AMP9, and it is likely that any new water treatment works arising from SRO's will be owned and operated by Bristol Water.

Our AMP8 strategy for our surface works is 100% maintenance funded, and is a combination of reactive and proactive maintenance to maintain current production capacity and to improve our resilience in particular relating to Instrumental, Control and Automation (ICA), with a special programme of work at site WxW_SS89 to address resilience issues in the short to medium term. We are not planning any large 'lumpy' investments at our surface works in AMP8, although we will be undertaking preparations for a possible rebuild of site WxW_SS62 in AMP9.

Hence we are not forecasting any changes to the Table C4 Water treatment type (complexity) or size data over the AMP8 period.

Our AMP8 strategy for our groundwater sites involves one enhancement project for nitrates, plus a rolling programme of reactive and proactive maintenance and a special programme of works to make improvements to disinfection as detailed in the following sections.

### 6.5.1. Enhancement

The only enhancement expenditure planned in this price control sub-category is the proposed nitrate treatment plant at site WxW_SS131 as detailed in WSX15 - Water networks plus strategy and investment Annex 1 and for which we have DWI support letter.

We are proposing a major programme of disinfection improvements but this is funded from maintenance.

### 6.5.2. Maintenance

We have a large number of sites, with a large number of assets of different ages and complexity. Our maintenance investment strategy over the next five years will be a combination of reactive and proactive replacement and upgrading based on the risk and asset management systems detailed previously.

As noted previously we have changed the way we categorise raw water to determine the disinfection requirements and updated our design standards accordingly. The scope of the work required to become fully compliant with the new approach is substantial and will not be achieved within a single AMP cycle. We are planning a significant programme of disinfection improvements in AMP8, this will be funded from maintenance.

# 7. Treated water distribution

## 7.1. Overview

Our treated water distribution network provides the supply to 1.3 million people across Somerset, Dorset and Wiltshire, and provides excellent customer service and performance as measured by:

- Industry leading compliance with the drinking water quality standards as measured by the CRI
- Industry leading resilience, we have not had to impose any restrictions (temporary use bans – hosepipe bans) on water use since 1976, and managed events like the 'beast from the east' and prolonged dry spells and peaks in demand without incident
- we have reduced leakage (three year average) from 79.3Ml/d in 2011/12 to 66.5Ml/d in 2022/23
- we have reduce customer contacts about the appearance, taste and odour of drinking water from the three year average of 2.3 contacts per 1000 population in 2013/14 reducing to 1.3 in 2022/23
- We have reduced supply interruptions to less than 5 minutes delivering industry leading performance

The following sections detail our asset inventory, performance and strategy for the principal asset groups that make up this price control subcategory.

See WSX15 Annex A4 for details of some of the recent and future innovations we are adopting to maintain and improve our performance and asset management: in particular alarm intelligence and analytics; flow, pressure and turbidity monitoring and digital twins.

## 7.2. Trunk mains

### 7.2.1. Asset Inventory

Trunk mains can be defined in a number of ways, by diameter, by function (moving water from one location to another, not feeding customers) and for leakage as all mains not within DMAs,

Wessex is a small predominantly rural area with no major conurbations, and therefore using the >320mm diameter size banding used in regulatory reporting we have a total of 970km of trunk mains at 31 March 2023, of which 570km are in the >320mm and ≤ 450mm size band, and 316km in the >450mm and ≤610mm size band and only 84km > 610mm. Our largest trunk main is 800mm. The material breakdown is shown below with the predominance of Ductile Iron relating to the age of our trunk mains shown in the following table.

*Table 24 – Trunk main material breakdown*

| Ductile Iron | Cast Iron | PE | Asbestos Cement | Steel | GRP | Concrete | PVC |
|---|---|---|---|---|---|---|---|
| 60% | 17% | 9% | 7% | 3% | 2% | 1% | 1% |

*Table 25 – Trunk main age breakdown*

| Up to 1920 | 1921 - 1940 | 1941 - 1960 | 1961 - 1980 | 1981 - 2000 | 2001 - 2020 |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 2% | 3% | 10% | 23% | 37% | 25% |

### 7.2.2. The Grid and Optimiser

In the previous decade we implemented our 'Integrated Grid' project as illustrated below which has provided a significant improvement to the resilience of our supply by facilitating the optimisation of source utilisation for security of supply and blending and substitution of sources avoiding the need for expensive treatment for some water quality issues such as nitrates which can only occur in winter.

*Figure 9 – Our Integrated Grid project*


Most of our Grid network is now remotely controlled through a 'closed loop' pump optimisation system, the Optimiser, which manages the network semi-autonomously by interpreting a series of inputs and constraints to ensure consistency and quality of supply whilst minimising costs and maximising energy savings. The Optimiser automatically recalculates the best way to operate the network to mitigate any outage events and improves the resilient operation of our water supply system whilst maintaining compliance.

Optimiser control has numerous benefits that not only enable a more proactive approach to operating the network, but also increases the speed that problems are resolved, thereby reducing supply risk to a minimum and improving

resilience in the round. This also helps minimise call outs and site visits out of hours with subsequent cost and efficiency savings.

### 7.2.3. Asset performance/strategy

The structural condition of our trunk mains is good, as evidenced by the Table CW20 condition grading shown below.

*Table 26 – Table CW20 asset condition for trunk mains*

| | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 | Total |
|---|---|---|---|---|---|---|
| PR24 Potable mains > 320mm (km) | 920.6 | 31.8 | 13.8 | 3.2 | 0.7 | 970.2 |

The main issue we have with trunk mains is water quality, and in particular the Black, Brown and Orange contacts which are the largest single component of the Appearance Taste & Odour customer contacts about water quality common PC and for which we have been issued with a DWI Regulation 28(4) Notice in 2021 to make improvements.

The Notice requires a reduction in BBO discolouration contacts in the AMP8 period in a number of specific zones as well regionally.

Therefore we are proposing a significant uplift in capital maintenance base expenditure in AMP8 and beyond to target the replacement of a number of trunk mains in specific water quality zones to achieve the requirements of our DWI Regulation 28 Notice.

Our current DWI Regulation 28(4) Notice for discoloration includes 8 water quality zones, and we are completing detailed system reviews in each of these. As part of our dynamic risk assessment we have identified a further zones where action may be needed and liaising with the DWI on whether these should be added to our notice.

## 7.3. Distribution mains

### 7.3.1. Asset Inventory

Distribution mains are the biggest asset group by value within this price control. Our total length of distribution mains at 31 March 2023 was 11,146km, of which 80% were ≤ 165mm in diameter.

The material breakdown is shown below with the predominance of Ductile Iron relating to the age of our trunk mains shown in the following table.

*Table 27 – Distribution main material breakdown*

| Cast Iron | PE | PVC | Asbestos Cement | Ductile Iron | Other |
|---|---|---|---|---|---|
| 36% | 26% | 18% | 11% | 8% | 1% |

*Table 28 – Distribution main age breakdown*

| -1920 | 1921 - 1940 | 1941 - 1960 | 1961 - 1980 | 1981 - 2000 | 2001 - 2020 | 2021 |
|---|---|---|---|---|---|---|
| 7% | 13% | 19% | 22% | 22% | 16% | 1% |

### 7.3.2. Asset Performance/strategy

The performance of our distribution network is good:

- Industry leading compliance with the drinking water quality standards as measured by the CRI
- Industry leading resilience, we have not had to impose any restrictions (temporary use bans – hosepipe bans) on water use since 1976, and managed events like the 'beast from the east' and prolonged dry spells and peaks in demand without incident
- we have reduced leakage (three year average) from 79.3Ml/d in 2011/12 to 66.5Ml/d in 2022/23
- we have reduce customer contacts about the appearance, taste and odour of drinking water from the three year average of 2.3 contacts per 1000 population in 2013/14 reducing to 1.3 in 2022/23
- We have reduced supply interruptions to less than 5 minutes delivering industry leading performance

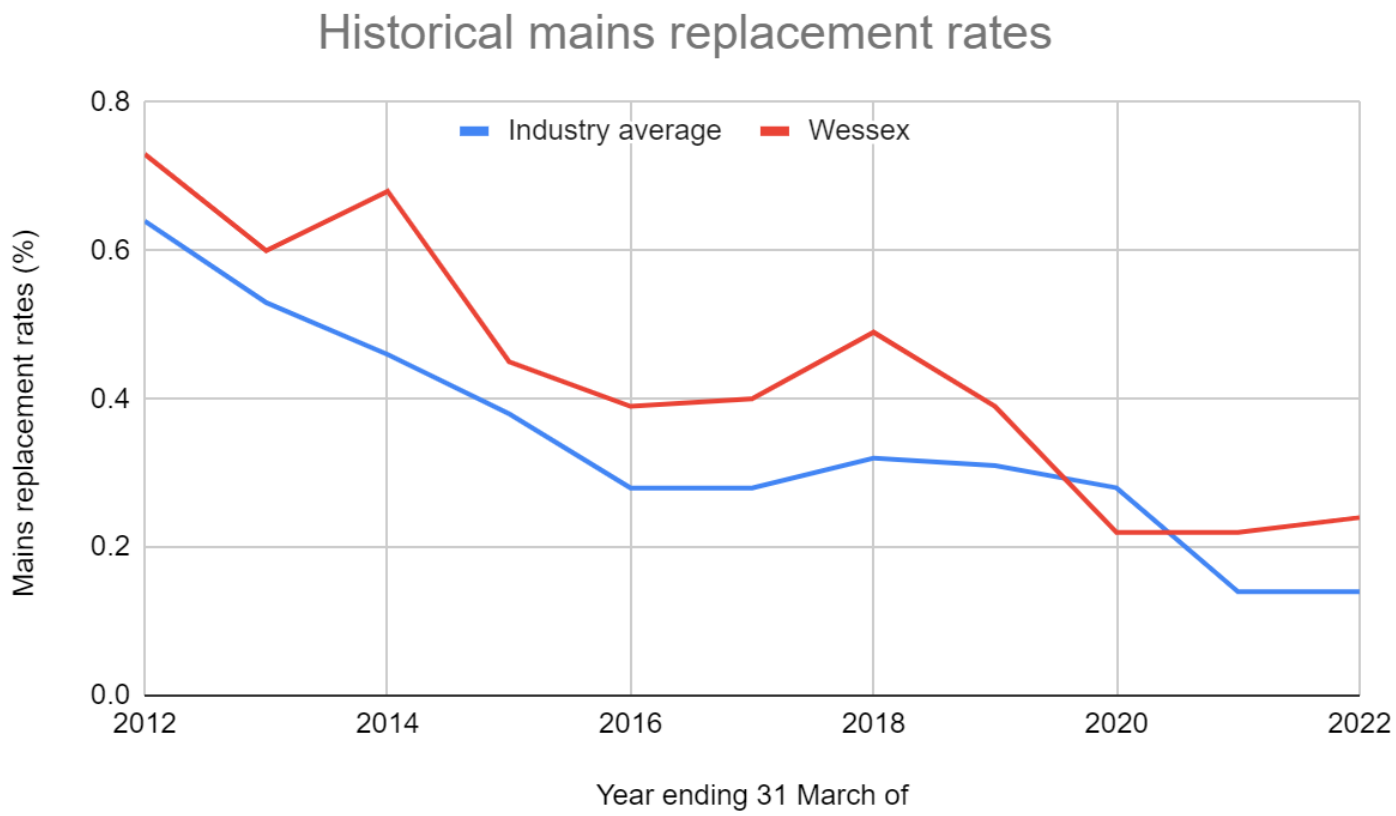
However this has been achieved through an increase in reactive activities and expenditure and a reduction in proactive mains replacement and as shown in below our mains condition has deteriorated.

*Table 29 – Mains condition grading comparison between PR24 and PR09*

| | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---|---|---|---|---|---|
| PR24 Potable mains total (%) | 53.5% | 24.1% | 18.7% | 3.4% | 0.3% |
| PR09 Potable mains total (%) | 57.0% | 31.6% | 10.0% | 1.3% | 0.1% |

As Ofwat has noted in Appendix 9 of the PR24 final methodology, the rate at which potable water mains have been replaced has fallen in recent years compared to levels seen earlier across the industry. The chart below shows industry average mains replacement rates since 2011/12 and compares this to Wessex Water's own replacement rates over that period.

*Figure 10 – Historical mains replacement rates across the industry*




We believe that the current low mains replacement rates are neither sustainable nor in the long-term interests of customers. This view is supported by industry-wide studies that considered this matter. A study undertaken for UKWIR in 2017 found that if the industry-wide mains replacement activity were to continue at the levels seen in 2016/17, there would be significant negative outcomes for customers and the environment by 2050.

We acknowledge that it may be possible to continue with the current low replacement rates in the near term, and focus on delivering outcomes that Ofwat has prioritised through its performance commitment framework (e.g. leakage and supply interruptions) through less capital intensive measures. However, we do not think that this is the long-term efficient approach for our customers.

Continuing with the current mains replacement activity with a view to increasing it in future AMPs would likely require much steeper increases in replacement rates to avoid the negative outcomes identified in the UKWIR report by 2050. This could lead to higher unit costs and deliverability issues as companies across England and Wales seek to do the same. It is far from clear that the risks to outcomes identified in the UKWIR report can actually be mitigated through remedial action when problems start to emerge. There are risks of adverse impacts on customer and environmental outcomes in the future, including risks of harm to customer trust in the industry and regulatory framework.

We believe that a more efficient approach, which is in the long-term interests of customers, would be to start to increase mains replacement rates in AMP8 and maintain higher rates going forward.

We are proposing a cost adjustment claim to base maintenance for this issue, see WSX09 - Annexes - Base cost adjustment claims include CAC2 – Mains replacement costs for further details.

We are proposing an increase to 0.4% per annum in AMP8, with a possible increase to 0.6% per annum in AMP9 with the long term sustainable level likely to be between 0.8% and 1.0%.

Based on the above strategy, and meeting long term expectations to further reduce leakage, we anticipate mains repairs stabilising over the long term at just under 180 repairs per 1000km of mains per year as detailed in our long term delivery strategy (LTDS). Our proposed PCL is shown below and is based on an increase in repairs needed to meet our leakage reduction target given that our proposed increase in proactive mains replacement will not have a material impact within the next five year period.

*Table 30 – Proposed performance commitment level*

| Repairs/1000km/yr | 2029-30 | 2034-35 | 2039-40 | 2044-45 | 2049-50 |
|---|---|---|---|---|---|
| Performance from base expenditure | 168.8 | 170.4 | 170.8 | 171.1 | 171.4 |

**Mains replacement and rehabilitation programme**

Our long-term plan for water distribution is to maintain stable asset health. We have just over 12,000km of water mains in our network and plan to increase our proactive mains replacement programme to 0.4%p.a. in AMP8 and anticipate further increases may be required in AMP9 and beyond. Prioritisation of mains replacement is based on and integrated approach looking at mains repairs and bursts, supply interruptions, leakage, and customer contacts about water quality, and water quality compliance risks.

Our water quality mains replacement programme is primarily targeted at reducing Brown Black and Orange customer contacts, which are the biggest single component of appearance contacts. Brown, black and orange contacts generally relate to the poor internal condition of unlined metallic water mains suffering from internal corrosion. Many contacts occur following network disturbance, such as a burst. Prioritising water quality mains replacement on brown, black and orange customer contacts also reduces the risk of compliance failures in the network, particularly with regard to iron and manganese.

Water quality driven mains replacement schemes are primarily identified using flushing data, discolouration customer contact data and asset age/condition assessments. Every customer contact is investigated through a desk top study as a minimum. One output from this investigation process can be to put forward a mains replacement scheme for the forthcoming year.

For our business as usual mains replacement activity, we are using an all in average unit rate of £350/m which has been developed based on the actual cost of schemes delivered under this programme over the last three years using our internal delivery team. We have a dedicated internal delivery team focussed on our business as usual mains replacement programme for all mains up to 320mm diameter. The internal delivery team has a mature and proven track record for delivering efficiently and innovatively and constantly challenges itself to use new construction methods to deliver safely to time, cost and quality requirements. Cost efficiency is supported by our supply chain frameworks and supplier/hub arrangements with over 70% of the overall project cost being competitively tendered.

To help prove the above, we have used the cost consultant ChandlerKBS to benchmark our mains replacement construction costs. They did this by applying their water sector costs models to a defined scope of work for a selection of recently completed schemes and this showed our internal delivery team was c23% more efficient.

**Mains flushing**

Wessex Water operates a routine water mains flushing programme as a means of mitigating the risk of water supply discolouration. The mains flushing programme runs from April to March each year and focuses on DMA level pipework.

The primary data source used to set the flushing programme is the customer contacts for discolouration over the previous four years, viewed at a DMA level via our dynamic risk assessment process.

Consideration is also given to DMA size, events causing increased contacts, previous flushing activities, network sample indicators and local knowledge of the areas. Currently we flush around 1200km of mains per year.

This process has been aligned to our DWSP methodology. The dynamic risk assessment with be a key feed into the flushing programme. Planned flushing activities are added to the DWSP system as actions.

## 7.4. Service reservoirs

### 7.4.1. Asset Inventory

The table below shows our asset inventory and forecast changes over the AMP8 period as reported in Table CW5.

*Table 31 – Service Reservoir and Water Tower asset inventory and forecast*

| | 22/23 | 23/24 | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 | 29/30 |
|---|---|---|---|---|---|---|---|---|
| Service Reservoirs (Nr) | 300 | 299 | 299 | 298 | 298 | 297 | 297 | 296 |
| Service Reservoirs total volume (Ml) | 628.8 | 628.7 | 628.7 | 628.6 | 628.6 | 628.5 | 628.5 | 628.4 |
| Water Towers (Nr) | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Water Tower total volume (Ml) | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |

At the end of March 2023 we had 300 service reservoir still in service, this is a very large number for a company of our size, ie with less than 650,000 connected properties. This is a legacy issue arising from the hydrogeology of our area which allowed a large number of small local sources being developed each requiring one or more service reservoirs. Whist many of these local sources have subsequently been abandoned the service reservoirs and pipe network configuration are largely unchanged. As shown below we have a very large proportion of very small reservoirs.

*Table 32 – Service Reservoir Capacity breakdown*

| | <0.5 Ml | 0.5 to <1 Ml | 1 to <5 Ml | 5 to <10 Ml | > 10 Ml |
|---|---|---|---|---|---|
| Service Reservoirs (Nr) | 101 | 42 | 119 | 31 | 7 |
| % | 34% | 14% | 40% | 10% | 2% |

Whilst the majority of our service reservoir are of modern reinforced concrete construction we still have a significant minority of legacy structures using brick and mass concrete etc.

At privatisation we had around 25 Water Towers in use, but many have been abandoned over the years and we only have 11 left in service. Our remaining water towers are a diverse group ranging from 1928 to 1996, from 0.14Ml to 3.0Ml, although all the remaining structures are of reinforced concrete construction apart from the three smallest which are steel.

### 7.4.2. Asset strategy

We have a proactive internal and external inspection regime, with all structures fully surveyed at least once every six years. Issues arising from these surveys are fed back into our maintenance prioritisation system. We have a rolling programme of service reservoir and water tower refurbishment works to ensure these importation asset group is kept in good condition.

Based on analysis of historic activity and current planning we anticipate the number of service reservoir will reduce by 1 site 0.1Ml in 23/24, no change in 24/25, and then in the AMP8 period it is assumed that 3 sites will be abandoned each with a capacity of 0.1Ml as summarised above and in Table CW5.

We do not anticipate abandoning any Water Towers in the AMP8 period based on recent inspections of our remaining in use asset stick, but should any unforeseen issue arise then we would always consider the abandonment option in any refurbishment appraisal. We think it unlikely that any new Water Towers will be built in the Wessex region.

The environmental destination for sustainable abstraction is likely to lead to significant changes to our treated water distribution system which may include additional service reservoirs but this will not occur until AMP9 at the earliest

## 7.5. Pumping stations

### 7.5.1. Asset Inventory

The table below shows our asset inventory and forecast changes over the AMP8 period as reported in Table CW5.

*Table 33 – Pumping Station asset inventory and forecast*

| | 22/23 | 23/24 | 24/25 | 25/26 | 26/27 | 27/28 | 28/29 | 29/30 |
|---|---|---|---|---|---|---|---|---|
| Total installed power (kW) | 28,724 | 28,749 | 28,774 | 28,799 | 28,824 | 28,849 | 28,874 | 28,899 |
| Pumping stations that pump into and within the treated water distribution system | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 |
| Number of potable water pumping stations delivering treated groundwater into the treated water distribution system | 54 | 54 | 54 | 54 | 54 | 54 | 54 | 54 |
| Number of potable water pumping stations delivering surface water into the treated water distribution system | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Number of potable water pumping stations that re-pump water already within the treated water distribution system | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| Number of potable water pumping stations that pump water imported from a 3rd party supply into the treated water distribution system | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

We undertook an Average Pumping Head (APH) data quality improvement project for APR23 ahead of PR24 which led to a number of changes to our pumping station asset inventory. Hence we are confident that our data for 22/23 represents the best possible starting point for forecasting these lines.

### 7.5.2. Asset strategy

We have a proactive and reactive maintenance strategy for this asset group. Generally most pumping stations have a duty - standby configuration or similar that enables one pump to be out of service whilst maintaining supply and similarly we have a resilient system that enable bigger issues to be manged without any significant impact to customers. Our reactive and proactive inspection, maintenance, repair and replacement programmes enable us to manage this asset group, the most significant issue be the lead times for new bigger pumps and we have established a specific proactive programme to mitigate this risk.

Maintenance of this asset group in AMP8 can best be described as business as usual maintenance, with no major projects planned, and our proactive programme for long lead time bigger pumps continuing.

As detailed in Table CW5 commentary based on activity in recent years we forecast an additional 1 pumping station per year in line 19 (pumping stations that re-pump water already within the treated water distribution system) as a consequence of new development with an average increase in total installed power of 25kW per station.

Based on our known capital programme for the remainder of AMP7 and in AMP8 we can be confident that we do not expect any changes the remaining pumping station data, all remaining activity is anticipated to the BAU like for like replacement.

The environmental destination for sustainable abstraction is likely to lead to significant changes to our treated water distribution system which may include additional pumping station but this will not occur until AMP9 at the earliest

## 7.6. Service pipes

### 7.6.1. Asset Inventory

The service pipe is made up of the Company owner communication pipe from the main in the street to the stop tap or Meter Valve Unit (MVU) close to the boundary of public and private land (footpath); and the customer owned supply pipe to the wall of the property/building.

We have undertaken a major data improvement project on service pipe asset inventory In preparation for PR24. This has resulted in a significant uplift from our previous estimates of lead and galvanised iron communication pipes.

At 31st March 2023 there were just over 600,000 communication pipes with an estimated length of 3,500km and just under 640,000 supply pipes with an estimated length of 4,500km, the difference in totals being due to shared services, ie single communication pipes that supply more than one property.

Hence the total service pipe length of 8,000km is two thirds of our current mains length of just over 12,000km and so these assets are a very significant element of our treated water distribution system.

### 7.6.2. Asset strategy

A lot of activity is occurring on our service pipes, the most common of which is leak repairs. We repair almost 10,000 leak on service pipes each year, including around 4,000 on customers supply pipes. We estimate that around 40% of all leakage is from service pipes and their connection to the main, and/or fittings on the service such

as the meter or stop tap. The customer supply pipe is not our asset, but our leakage policy for service pipe replacement means that for household customers in most cases we treat these assets as if they were our own.

In addition service pipes can be the root cause of customer contacts about the Appearance or Taste & Odour of drinking water and our investment towards this PC includes work on service pipes, both company owned communication pipes and customer supply pipes in some circumstances.

Expenditure on both of the above is maintenance. We are also have significant investment in lead pipe replacement, but this is funded from enhancement as detailed in the following section.

We do undertake some work on the separation of shared services, (one communication pipe supplying several customer supply pipes), mainly due to low pressure complaints and property development but the investment level is not material. This is funded from maintenance

Service pipes are the critical final link from our sources to the customers tap and their maintenance is essential to the delivery of our water services.

All service pipes have been mapped within our GIS environment using a logical connection from properties to the nearest distribution main with the exact location, material and condition of service pipes from the 10,000 repair/replacement jobs undertaken each year being mapped back to GIS to update the logical connection.

We are unable to undertake any specific service pipe deterioration modelling primarily because we don't have robust data on location, age and material. We have been mapping back repair and replacement activity on service pipes for around some years now and we hope to do some deterioration modelling for PR29 when we should have sufficient data to give statistical validity.

The key objective for water infrastructure capital maintenance is to deliver the highest quality drinking water without unexpected interruption. Our performance against this overriding objective is monitored through our performance commitments.

Our approach to the maintenance of service pipes is very much a business as usual approach with proposed maintenance expenditure set at historical levels as we have no evidence of significant asset deterioration in the short to medium term.

There is very little scope for further efficiencies as our existing approach is reactive to failure or new information with targeted intervention.

Government has previously consulted on the future ownership of private water supply pipes, but we do not anticipate any change in this area for the foreseeable future and have not made any additional allowances for this.

### 7.6.3. Lead pipe replacement

Our strategy to manage the public health risks from legacy lead pipework involves a twin track approach of plumbosolvency control to manage the public health risk in the short to medium term and pipe replacement to remove lead from our network over the longer term.

In AMP6 our lead pipe replacement strategy was reactive replacement only, and we spent around £2.5m of enhancement funding in total over the five years.

For AMP7, to make a significant step up towards removing all lead from our network, we adopted a new replacement strategy bolstering our existing reactive policies with a new proactive street by street replacement programme. As part of both replacement programmes, we replace our communication pipe and the customers supply pipe free of charge up to the outside the property (subject to the customer giving their consent), with some

exceptions where cost and/or practicality would be prohibitive. Total enhancement funding in AMP7 is forecast at around £13m.

For AMP8, we intend to continue with our AMP7 strategy, but with some improvements targeted at improving the public health benefit, and further increasing the scale of activity to step up again towards removing all lead from our network over the longer term. Total enhancement funding proposed for AMP8 is just over £27m. We also plan to offer a grant to those customers who under the proactive programme we can't replace their external supply pipe for whatever reason, and anticipate a portion of this may be used for replacing or relining internal lead pipework.

The following data is taken from the underlying calculations used to populate PR24 Table CW6.

*Table 34 – Lead pipe replacement activity*

| | 25/26 | 26/27 | 27/28 | 28/29 | 29/30 |
|---|---|---|---|---|---|
| Number of lead communication pipes | 104,481 | 103,281 | 102,081 | 100,881 | 99,681 |
| Lead communication pipes replaced/relined for water quality | 1,140 | 1,140 | 1,140 | 1,140 | 1,140 |
| Lead communication pipes replaced for other reasons | 60 | 60 | 60 | 60 | 60 |
| Total length of lead communication pipes replaced or relined | 5,912 | 5,912 | 5,912 | 5,912 | 5,912 |
| Number of external lead supply pipes replaced or relined | 600 | 600 | 600 | 600 | 600 |
| Total length of external lead supply pipes replaced or relined | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 |
| Number of internal lead supply pipes replaced or relined | 0 | 0 | 0 | 0 | 0 |
| Total length of internal lead supply pipes replaced or relined | 0 | 0 | 0 | 0 | 0 |

The Kobus Pipe Puller is an innovative trenchless technology. The process requires only two small excavations which minimises disruption. This innovative technology installs the new service pipe at the same time as pulling out the old pipe and does so with minimal excavation and risk to other utilities and very little disruption to the homeowner.

### 7.6.4. Conclusions

Our approach to the maintenance of service pipes is very much business as usual with proposed maintenance expenditure in line with the long-term rising trend as we further reduce leakage and reduce customer contacts about water quality (Appearance, Taste & Odour).

## 7.7. Meters

### 7.7.1. Asset Inventory

In total at the end of March 2023 we had 479,000 meters which can categorised as follows (excluding voids).

*Table 35 – Meter Asset Inventory*

| Type | Function/Location | Number |
|---|---|---|
| Revenue | Household | 433,000 |
| | Non household – small | 37,000 |
| | Non household – large (>25mm) | 4,000 |
| Non-Revenue | At WTWs, SRs, Booster & in the network | 5,000 |
| | Total | 479,000 |

For Water Treatment Works (WTWs) the above generally only includes raw water abstraction meters and treated water distribution input meters, flow meters used within the WTW processes are included in the Water treatment sub-category.

For Water Treatment Works (WTWs) the above generally only includes raw water abstraction meters and treated water distribution input meters, flow meters used within the WTW processes are included in the Water treatment sub-category.

Household meter penetration is forecast to increase from 72% in 2022/23 to 77% in 2029/30, hence we anticipate the total number of meters to increase to around 465,000 by 2029/30.

At present all our revenue meters are basic (manually read), except for a small number of AMR (Automatic Meter Reading) units. Our proposed smart metering programme will result in around 168,500 basic meters being replaced with AMI (Advanced Metering Infrastructure) units over the AMP8 period.

### 7.7.2. Revenue metering strategy

Our previous strategy for revenue meter replacement was a combination of reactive on failure and age related (> 15 year) proactive replacement avoiding excessive cost (limited to only external screw in meters without any complications, but including household and non-household meters). Expenditure in this area was relatively modest at less than £1m/yr

The future is very different to the past, with our proposed AMP8 smart metering strategy resulting in a significant uplift in meter replacement and new meter installation activity as summarised below.

- Installation of 240’000 AMI smart meters to household customer properties including:
  - replacement of 168,500 basic meters with smart meters
  - installation of 52,100 smart meters at previously unmeasured properties
  - installation of 19,400 smart meters at new properties

- Installation of 16,700 AMI smart meters to non-household properties including:
  - replacement of 15,850 basic meters with smart meters
  - installation of 860 smart meters at previously unmeasured properties

Our smart metering roll-out programme will extend over AMP8 and AMP9 and be funded through enhancement expenditure. This will result in a reduction in meter maintenance costs.

### 7.7.3. Non Revenue metering strategy

Our 5,000 non revenue meters are made up of a mix of sizes, types and functions, and our business as usual management of this asset group comprises both reactive and proactive maintenance.

Our proposed leakage reduction strategy does include for some additional meter installations but this is not significant.

### 7.7.4. Conclusions

The maintenance of this asset group is essential to accurately measuring the water delivered to customers and managing leakage and supply interruptions within our network and we have robust management systems in place to ensure this happens.

Our proposed smart metering programme is essential to meeting PCC and leakage reduction targets. This will result in very large enhancement expenditure in AMP8 and beyond.

# 8. Summary

## 8.1. Overview

We are proposing a significant increase in both enhancement and maintenance expenditure in AMP8 over the current AMP7 period as summarised in the table below and detailed in the previous sections. See WSX15 Annex A4 for details of some of the recent and future innovations we are adopting to maintain and improve our performance and asset management.

*Table 36 – High level expenditure summary*

| Water network+ price control | AMP7 £m | AMP8 £m | AMP9 £m |
|---|---|---|---|
| Enhancement | 45 | 173 | 185 |
| Maintenance | 276 | 375 | 409 |
| **Total** | **320** | **548** | **594** |

## 8.2. Enhancement

Our enhancement expenditure in AMP8 is summarised in the table below.

*Table 37 – Enhancement programmes*

| Enhancement programmes | AMP7 £m | AMP8 £m | AMP9 £m |
|---|---|---|---|
| Lead pipe replacement | 13 | 27 | 27 |
| Nitrate treatment/blending | 10 | 20 | £0 |
| Metering | 14 | 78 | 100 |
| Leakage reduction | 0 | 20 | 50 |
| Security – Cyber | 7.5 | 27 | 8 |
| Laboratory enhancement for PFAS | 0 | 1.3 | 0 |
| **Total** | **45** | **173** | **185** |

Our leak pipe replacement programme is a continuation and evolution of our existing policy of reactive and proactive replacement with the scale and scope increased to make another step towards our long term vision to have a lead free network. The DWI have indicated that they supported this position although we have not yet received their final decision letter. We are current forecasting remaining at this level of investment in AMP9, but our LTDS does include an alternative pathway where expenditure is doubled again in AMP9 to reach a glide path to achieve lead free by 2060.

We have deployed all of the options available to us to manage the nitrate issue over the last few decades including; extensive catchment management, source substitution in winter, blending and treatment. Whilst we focussed efforts

on green solutions with significant success, the current nitrate trend at the major baseload source at site WxW_SS131 is such that we have no option but to install treatment, and the DWI have supported this position with their final decision letter as detailed in WSX15 Annex 1. Our LTDS core pathway assumes no further nitrate treatment is required, however we have an alternative pathway with significant further nitrate treatment being required.

In response to the July 2023 EA Information Letter 17/2023 to consider phasing activities from PR24 into future price review periods we have scaled back our proposed leakage reduction and smart metering programmes from that just proposed in our revised WRMP. Our forecast leakage reduction in AMP8 has reduced from 7.6Ml/d to 3.5Ml/d, and our smart metering target from 75% of properties (HH & NHH) smart metered by 2030 to 40%. We plan to return to the glide path for the 50% leakage reduction and 110l/h/d PCC by 2050 in AMP9. We have retained our smart meting target to reach 95% saturation by 2035 which requires significant funding in AMP9.

## 8.3. Maintenance

The key elements of our maintenance expenditure in AMP8 is summarised in the table below.

*Table 38 – Maintenance programmes*

| £m @ 2022-23 | AMP7 £m | AMP8 £m | AMP9 £m |
|---|---|---|---|
| Raw Water Transport & Storage | 0.3 | 0.3 | 0.3 |
| Water Treatment Works | 96 | 140 | 144 |
| Trunk Mains | 22 | 44 | 41 |
| Service Reservoirs | 21 | 18 | 24 |
| Booster pumping stations | 3 | 4 | 4 |
| Distribution Mains | 98 | 138 | 158 |
| Service Pipes | 27 | 28 | 35 |
| Water Meters | 8 | 4 | 4 |
| **Total** | **276** | **375** | **409** |

This significant uplift in investment is essential if we are to do the right thing for customers and the environment, within the current policy and regulatory framework. We have carefully prioritised and only included what we need to do to meet legislative and regulatory expectations and deliver the outcomes our customers and communities support.