August 2026

Leakage Reporting Methodology – Consultation

Ofwat

About this document

This document is a consultation seeking views on a new approach to reporting leakage.

Our consultation includes a summary of the concerns with the current reporting methodology, a consideration of options and preferred options where they have been identified. It also considers a timeline for implementation of the changes.

We have no plans to change the current methodology for reporting used in this price review period.

Similarly, we have no plans to change leakage targets for this price review period or long-term ambitions, nor do we expect that any change to reporting methodology should impact on water resource planning.

There are several technical reports[1] that Ofwat has commissioned over the last year which have influenced this consultation. Consultees may want to read those technical documents when responding to this consultation.

[1] Five reports are published here Leakage Reporting Methodology - Ofwat

Executive summary

This consultation seeks views on how leakage should be reported by water companies in England and Wales from some point in the future. It is not a consultation on changing leakage reduction targets, nor the level of ambition expected from companies, or the outcome delivery incentive rates associated with performance against those targets. The focus of this consultation is the methodology used to calculate and report leakage so that reported figures make best use of increasing amounts of data from smart meters and hence are more accurate, consistent, and transparent.

Leakage remains a high priority for customers[2], the environment and long-term water resilience. However, reported leakage cannot be directly measured. It is estimated using a water balance that compares distribution input with water delivered to customers and other accounted-for uses. This is compared against a bottom-up analysis of flows in district metered areas and reconciliation of any water balance gap between the two methodologies through a process of Maximum Likelihood Estimation.

Whilst this approach has been in place for many years and uses real data where available, it also relies on extrapolation from sample data, estimates and assumptions. In particular, one of the largest components of the water balance is an assessment of unmeasured household consumption which is derived from an extrapolation of sample data. The growing availability of smart meter data means that it is now timely to revise the methodology for reporting leakage.

This consultation also looks at the approaches to leakage reporting that are used other countries and territories. As part of the development of this consultation, we have employed consultants to carry out a review of leakage reporting methodologies [3] for a select number of countries around the world.

This consultation also considers how the accuracy of many of the components of the water balance could be improved.

This includes distribution input, measured and unmeasured consumption, upstream and distribution leakage, customer supply pipe leakage, minor components, uncertainty and reconciliation, metering standards, reporting frequency and the scope of application to new appointments and variations. For each of these components we consider options ranging from retaining current arrangements to adopting more standardised and data-led approaches. Ofwat is seeking views on the practicality, cost, timing and benefits of these

[2] Wave 2 customer research by CCW and Ofwat which shows leakage has a 79% - 6th highest importance score amongst respondents. Priorities-Tracking-Research-Quarter-2-Report-Wave-2.pdf
[3] International Leakage Analysis and Comparison - Final Report

methodology changes as well as considering how quickly changes could be introduced and at what cost/benefit. We recognise that some improvements could be implemented relatively quickly, while others may need to be phased, particularly as smart metering coverage increases.

Responding to this consultation

The closing date for this consultation is **Friday**, **9 October 2026**. Please email us at leakage2050@ofwat.gov.uk with your response or if you wish to discuss any aspect of this consultation. You can also post your response to:

Leakage 2050 Consultation response
Ofwat
Centre City Tower
7 Hill Street
Birmingham B5 4UA

We intend to publish responses to this consultation online, on the relevant consultation platform. Subject to the following, by providing a response to this consultation you are deemed to consent to its publication. If you think that any information in your response should not be disclosed (for example, because you consider it to be commercially sensitive), you should identify specific information and explain in each case why it should not be disclosed and provide a redacted version of your response. An automatic or generalised confidentiality disclaimer will not, of itself, be regarded as sufficient. We will consider your request when deciding what information to publish. At a minimum, we would expect to publish the name of all organisations that provide a written response, even where there are legitimate reasons why the contents of those written responses remain confidential. In relation to personal data, you have the right to object to our publication of the personal information that you disclose to us in submitting your response (for example, your name or contact details). If you do not want us to publish specific personal information that would enable you to be identified, our privacy policy explains the basis on which you can object to its processing and provides further information on how we process personal data.

In addition to our ability to disclose information pursuant to the Water Industry Act 1991, information provided in response to this consultation, including personal data, may be published or disclosed in accordance with legislation on access to information – primarily the Freedom of Information Act 2000 (FoIA), the Environmental Information Regulations 2004 (EIR) and applicable data protection laws.

Please be aware that, under the FoIA and the EIR, there are statutory Codes of Practice which deal, among other things, with obligations of confidence. If we receive a request for disclosure of information which you have asked us not to disclose, we will take full account of your explanation, but we cannot give an assurance that we can maintain confidentiality in all circumstances.

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1. Introduction

Reducing leakage remains one of the top priorities for customers[4] and the environment. The National Infrastructure Commission[5] (now National Infrastructure and Service Transformation Authority NISTA) warned that there without further action there will be insufficient water to meet England and Wales needs by 2050.

In England we are using water faster than nature can replace it, and in Wales the changing climate is putting pressure on supplies. Without action, England faces a projected shortfall of five billion litres of water a day by 2055. New supply schemes will help, but managing demand (including leakage) is one of the most impactful things we can do over the next five to ten years.

The water companies have committed to reducing leakage by 50% by 2050[6].

Through our 2024 Price Review (PR24), over £700 million has been allowed for companies to further reduce leakage in the network. This is supported by additional allowances of over £1.7 billion for delivery of 10.4 million smart meters to support companies to reduce leakage and reduce household consumption [7]..

The amount of water lost to leakage cannot be directly measured. Leakage as reported has to be 'estimated', by adding up all the water put into the supply network and subtracting all the water that has been delivered. One of the main challenges with this process is the relatively high proportion of properties that remain unmetered; therefore, the water delivered to these properties has to be estimated. The resulting leakage figure is then cross checked against flows at night when customer use is at a minimum. Overall, the current approach relies on assumptions, estimates, statistical modelling and measurement to arrive at a final leakage estimate.

England and Wales have been at the forefront of Leakage Reporting since the 1980s and the current methodology for estimating leakage is largely based on the 1994 publication Managing Leakage.

1.1 Proposed change

This consultation does not consider changing the targets agreed with companies to reduce leakage, nor the payment rate for under or outperforming against those targets. The

[4] Priorities-Tracking-Research-Quarter-2-Report-Wave-2.pdf
[5] NIC-Preparing-for-a-Drier-Future-26-April-2018
[6] Water-UK-A-leakage-Routemap-to-2050.pdf
[7] Leakage - Ofwat

companies have delivered the lowest level of leakage since privatisation but there is still more to do.[8] We have made sure that the targets we set companies are stretching. For the 2025-30 period we have set targets based on a further reduction of 457.3 Ml/d (a 17% cut between 2024-25 to 2025-30). [9]At the last price review PR24, Ofwat funded companies to install 10.4million smart meters over the period 2025-2030 (The five-year period referred to as AMP8 – the eighth 'Asset Management Plan' (AMP) period since privatisation in 1989) The investment being made in smart meters provides an opportunity to improve the current approach. In this consultation Ofwat is considering improvement to the methodology for reporting leakage. We are consulting on how to change from the current 'estimation' to an approach that makes use of more robust data, more of a calculation than an estimation. The investment being made in smart meters provides an opportunity to improve the current approach.

We are consulting on the best way to move to use smart meter data and move away from interpolations derived from statistical samples. Companies are at different states of installation programmes for smart meters. This means that some companies can adopt to the new methods proposed more quickly than others.

1.2 Why now

Over the next 15 years the majority of customers will be fitted with smart water meters. Some companies will be in a position where 80% or more of their properties have a smart meter. For those companies it will be possible to improve their leakage reporting in the 2030-2035 asset management period ("AMP"), for others they will be able to make incremental improvements as their smart meter roll-out progresses. Therefore, a change in reporting methodology is needed now, to allow companies time to prepare for the next AMP.

1.3 What is the timeline?

We are consulting now to consider whether these changes could be made from the start of the next AMP. Ofwat is considering what investment needs would be required against the benefits delivered by changes. If the decision is that to deliver a marked improvement in the accuracy of reported leakage will require significant investment, (and there is a clear benefit in doing so) then we may choose not to implement from the start of PR29. We are also considering whether to phase the change from current to new reporting methodology.

[8] Summary of Leakage - Ofwat website
[9] www.ofwat.gov.uk/households/supply-and-standards/leakage/

1.4 Structure of this consultation

Within each section of this document we;

- list the current approaches to calculating leakage and then,
- discuss options we have considered.
- make suggestions for how we propose to change the reporting and then.
- ask a small number of targeted questions to get stakeholders views.

2. What is leakage and why do we want companies to report it?

2.1 Do we need to report leakage?

In June 2025 the Independent Water Commission published their review of the water sector[10]. Amongst the recommendations in this review is a change to how the water companies are regulated. This is still work in progress and we cannot prejudge what the government will decide.

Ofwat considers the metrics and targets that incentivise companies to deliver the right outcomes for customers and the environment.

We remain of the opinion that companies should be expected to report accurately how much water is delivered to customers, and how much is leaked or otherwise unaccounted for.

2.2 Summary of current position

Companies are currently required to report their best estimate of leakage, using the current guidance set out by Ofwat which is stated in the PR24 Leakage Performance Commitment Definition,

Annual average leakage is defined as the sum of distribution system leakage, including service reservoir losses and trunk main leakage plus customer supply pipe leakage. It is reported as the annual arithmetic mean (referred to as 'average') daily leakage expressed in mega-litres per day (Ml/d). It is reported as a post-Maximum Likelihood Estimation (MLE) figure. The MLE process is discussed further in section 10 below.

Each company is required to report against this definition and:

- report a post-MLE average leakage value expressed as Ml/d to one decimal place.
- disclose in its Annual Performance Report (APR) where its methodology does not comply with published methods and
- disclose in its APR any other factors which have an impact on the methodology for reporting leakage.

[10] Independent Water Commission Final Report

There is currently different guidance for New Appointments and Variations (NAVs) and consider them in this consultation in section 13 below.

This definition is structured in the way that leakage is normally calculated and comprises:

- a calculation of daily leakage from continuous monitoring and regular analysis of zonal / tile or district meter area (DMA) nightlines (commonly referred to as “bottom up”)
- an annual assessment of the distribution input and the total amount of consumption and other water use as described in this document (commonly referred to as “top down”); and
- the water balance reconciliation using the MLE methodology.

2.3 Potential concerns regarding current approach

Ofwat has required companies to report leakage since shortly after privatisation in 1989. In 2018 Ofwat commissioned a study into how companies report leakage and this led to a published convergent methodology in 2018[11]. Consumption patterns changed significantly as a result of changes to working patterns during and after the Covid pandemic. By 2025-26 not all companies are compliant with the convergent methodology, albeit Ofwat accepts that in each year they report and, in most instances, that the noncompliance is 'not material' (i.e. it doesn't have a significant (material) impact on the reported figure). This is backed by independent assurance that companies publish on their websites to accompany their Annual Performance Reviews.

Even after setting out the convergent methodology in 2018, there are significant differences between the approaches taken by each of the companies in their water balance. Of most concern is the range of 8% to 25% in the confidence intervals associated with bottom-up leakage estimation. This is of concern as the methodology for reporting bottom-up leakage should be similar for all companies, and it would be reasonable to expect them to report with more similar confidence intervals.

Whilst the overall water balance approach by each company is similar, the different companies apply slightly different approaches which makes like for like comparisons more difficult.

Another concern is that some of the components in the water balance need to be estimated or have missing data which must be interpreted from available data. A significant component of the water balance is unmeasured household consumption

[11] Reporting guidance - leakage - Ofwat – note that this document is superseded by the PR24 leakage performance commitment.

(PCC)– which is derived from sample surveys. The level of unmeasured household consumption has a significant impact on reported leakage.

We require companies to report a three-year rolling average leakage in order to smooth out reporting and ODI impacts for unusual performance (typically weather shocks)

Due to subtleties in the methodologies used by Ofwat and the environmental regulators (Environment Agency (EA) and Natural Resources Wales (NRW)), it is likely that that there will be small differences in leakage as reported to Ofwat and to EA/NRW. For example, the application of the MLE adjustment to a whole company or to a specific water resource zone will give slightly different results. This difference does nothing to improve customer and stakeholder confidence in the companies or regulators.

The current methodology requires companies to report all leakage on both their assets and customer supply pipes. With the smart meter roll out it will be possible for companies to better understand how much leakage is on customer supply pipes. This in turn will allow companies to revise and improve their approach to customer supply pipe leakage.

2.4 Options considered[12]

Do nothing (leave as is)	Acknowledge that the process for calculating leakage in England and Wales is appropriate. Acknowledge that any changes might be problematic costly and might not lead to a more accurate reporting of leakage.
Adopt International Water Association (IWA) approach	Many countries use the IWA water balance (Or similar top-down method) approach to report leakage. This is simpler than the England and Wales approach and would provide clear international comparators. However, most customers are metered in the countries and territories that use IWA. We do not currently have that level of maturity in our customer metering.
Tighten Existing Guidance	Understand the drivers for the differences that exist between companies interpreting the convergent methodology published in

[12] A common note for all Options considered in this document. These are a summary of the wide range of arguments and do not represent Ofwat's views.

	2018 (now incorporated into the PR24 Leakage Performance Commitment). Further develop best practice
Develop new performance measures	Start again from first principles and develop a new approach.

2.5 The case for DMAs and bottom-up reporting

Compared to many overseas countries and territories, England and Wales are unusual in that not every customer is served by a flow meter. To provide the best possible estimate of leakage and operational targeting England and Wales uses both top-down and bottom-up reporting methods with any discrepancy between the two methods reconciled using a Maximum Likelihood Estimation (MLE) calculation. This approach was developed and adopted in England and Wales to deliver an accurate and robust leakage calculation that did not require high levels of customer metering.

All companies in England and Wales have setup discrete areas of the network called district metered areas (DMAs). They typically contain around 1,000 properties, but in some cases are much smaller and in other cases much larger. They allow water companies to monitor and assess flows, as well as hydraulically control each DMA. DMAs are designed to be small enough so that companies can detect changes in flow which might be leaks. Most companies in England and Wales use these as the building blocks of their bottom-up calculation, although some do use larger zones typically containing many DMAs.

The bottom-up method is based on the principle that leakage is calculated at night when customer use is at a minimum (the period we call the minimum night flow or 'MNF'), and therefore demand is a smaller proportion of the total flow than during the day. The current focus on MNF and customer night use mean that all measurements occur during the minimum flow period, which is when flowmeters typically perform poorest as they tend to under-register at low flows.

As levels of metering, and particularly smart metering, continue to increase, the benefits of the bottom-up methodology may diminish. In fact, when a high level of metering is achieved in 2035 and beyond, it is possible that the bottom-up method will have a greater uncertainty than the top-down method.

However, DMAs also offer enormous benefits to water companies in managing the network in terms of pressure, supply interruptions, water quality and leakage detection. Quantification

of leakage at DMA level through the MNF method is fundamental to how most water companies manage and reduce leakage on their networks. They offer a high resolution, daily quantification of leakage and demand that it would be difficult to match by a top-down method with high levels of metering.

The bottom-up method also provides a valuable and important cross check against the top-down method, giving confidence in the reported leakage figure. Given that many water companies continue to have water balance gaps resulting in their methodology not being compliant with our guidance, we believe it will be many years before there is sufficient confidence to use one method exclusively.

2.6 Preferred Option

Whether leakage remains as a performance commitment or is incorporated into a wider environmental or demand commitment, we believe that an accurate understanding of leakage will always be required.

We do not believe that now is the right time for England and Wales to move towards a top-down only leakage reporting approach. This is because since the 1990's the sector has spent significant time and effort in establishing DMAs and at this time there is not sufficient data for metered customers to enable a move to a purely top-down approach. We also believe that the cross check of the two methodologies (top-down and bottom-up) provides further confidence in the reported leakage figure.

We therefore propose keeping top-down bottom-up reporting but as discussed in section 7 below we are open to changes to the bottom-up approach (which could be a 24-hour mass balance rather than the current analysis of the minimum night flow period)

2.7 How quickly could this be implemented?

This is to be determined after consideration of the responses to this consultation. It is recognised that small changes or improvements could be quickly implemented, but we want to balance this against making the right changes that are fit for a generation. More significant changes may require investment (for example additional metering in the distribution system).

2.8 Consultation

Questions to stakeholders

Question 2.1 Do you agree with our proposal to keep a top-down bottom-up approach?

3. Distribution input

3.1.1 Summary of current position

Distribution input (DI) is fundamental to leakage reporting. It is the single largest component in the water balance. DI is a measure of the volume of potable water input to the distribution network from all treatment works, boreholes and bulk supply (transfer to and from neighbouring water company) locations. DI is reported as an annual average Ml/d.

The company is expected to report DI by using the following criteria:

- The company shall meter DI to the system with at least daily readings at all defined locations;
- The meters that the company uses shall be an appropriate size for the flow to be measured and located at appropriate inputs to the network confirmed by record plans.
- The company shall exclude any treatment works that take off water flows downstream of a meter from the DI calculations;
- The company shall carry out data validity checks at least monthly;
- The company shall infill any missing data using interpolated data. It will use data immediately preceding and following the period of missing data to infill data. This can be extrapolated from pump hours or use of upstream or downstream meters;
- The company shall check and validate data transfer systems from meter output to a central database on a risk-based approach. The frequency of checks will be between one and two years, and meters can be verified or calibrated in situ as set out later in this definition.

Section 12f of the RAG compliance in our guidance states.

> *"Flow checks are carried out on DI meters consistent with the principles of the document 'EA Abstraction Good Metering Guide' and in particular the frequency of flow checking defined in Table 6.2 of the Environment Agency guide".*

3.1.2 Potential concerns regarding current approach

Ofwat, the companies and other stakeholders rightly need confidence in the accuracy and consistency with which DI is measured.

There are however notable variations in the approaches that companies use for meter accuracy, verification and calibration (this is partly connected to meter accuracy and covered in Section 11 of this document). These variations are caused by differences in meter selection, installation, maintenance, verification and calibration. Further differences are noted in the ways that companies process data from their meters. Whilst the differences can largely be explained and are subject to varying degrees of external assurance, they lead to concerns about the overall accuracy and confidence that regulators and other stakeholders should place on reported data.

The range, accuracy and confidence in DI is a fundamental part of the water balance. Current Ofwat reporting guidance says that 'fully measured components such as DI should be within a 2-4% confidence interval. We know that's some companies currently report +/-2%, whereas others report slightly worse than +/- 5% confidence interval.

Current studies into meter uncertainty suggest that +/-2% would be exceptional performance and that +/-5% might be more realistic. Given that across all companies' leakage is reported at an average of 19% of DI, accepting an uncertainty as high as +/-5% on DI could have a significant impact on both the accuracy and the level of reported leakage. Ofwat is of the opinion that further work is required to specific and maintain levels of meter accuracy. This is dealt with in Section 11 of this document.

We have further concerns about the impact of a +/- 5% uncertainty on the accuracy of the water balance. This provides a perverse incentive when the Maximum Likelihood Estimation is applied to the water balance. In many cases a higher uncertainty on DI meters results in more of any Water Balance Gap being applied to DI (and hence less to leakage). In such a case the company would receive financial and reputational benefit when leakage performance and Outcome Delivery Incentive payments are calculated, i.e.: the company receives the benefits of reducing leakage when it has not actually reduced the amount of water lost to leaks.

There is no current definition of meter accuracy, maintenance, calibration/verification, checks and balances or even location for DI metering, although, as set out earlier, Section 12 of the Leakage PC definition states that DI meters should have flow checks on them.

Current guidance refers to metering in accordance with Environment Agency Abstraction Metering Good Practice Manual. We are aware from our colleagues in the EA that any future revision of this manual will not lead to a more accurate metering standard. We cover options considered to replace this and our preferred option in Section 11 of this document.

3.1.3 Options considered

Do Nothing	The current situation is as well managed as companies need, and budgets will allow.
Add metering to asset management standards	Ask the companies to review their own metering stock and to ensure fitness for purpose
Encourage Appointees to develop a metering standard	Do not dictate what the standard should be but encourage companies to work towards a consistent standard
Develop a metering standard	Create a metering standard to which all companies should achieve or exceed. Consider regulatory levers to reward out performance and to disincentivise noncompliance

3.1.4 Preferred option

From our discussions with other regulators and stakeholders we do not believe that any revision to the EA Abstraction Meter good practice manual will provide sufficient granularity of guidance for our purposes.

Our preferred approach is therefore to develop an industry wide metering standard for all meters in the distribution system. This guidance would cover the selection of appropriate technology, installation, maintenance, validation of accuracy and set out corrective actions and timescales for action where there are concerns about accuracy or meter accuracy is found to be unacceptable.

As part of this guidance we would set tighter limits for the uncertainties acceptable in both the Water Balance and MLE reconciliation.

We propose to consider ways of incentivising compliance with the standard (and disincentivising any non-compliance.) We are also considering how to incentivise accuracy of reporting alongside the need for companies to continue to meet regulatory targets.

3.1.5 How quickly could this be implemented?

Ofwat expects that the standard can be developed in 2026 and 2027 and hence timely for any investment needs to be included in the PR29 Business plan submissions. Companies who find that their metering is already closely aligned with the new standard may be able to implement from 2030. Those companies with less maturity in their metering may need to account for investment needs in their business plans in order to improve their metering over the next price review period (2030-2035).

3.1.6 Consultation questions

Q3.1. Can you identify any particular concerns with this proposed approach?

Q3.2 Do you believe and if so, how should meter accuracy be incentivised?

4. Measured consumption (Household and Non-Household)

This component covers the reporting of households and non-households where a meter is fitted. We recognise that there will be a small number of occasions where properties fitted with a meter may be billed based on assessed usage.

4.1.1 Summary of current position

The requirements for reporting measured consumption are set out within the definitions of the per-capita-consumption (PCC)[13] and business demand[14] performance commitments.

Currently the approach is aligned with the process and systems used for billing customers.

4.1.2 Potential concerns regarding current approach

The alignment with billing processes creates a range of challenges. The most substantial concern is billing cycles, with customers often billed every six months, leading to readings not aligned with the reporting year, regardless of the frequency of meter reads. Therefore, the volume recorded requires necessary accrual estimates, which add uncertainty to the volume billed within the reporting year.

The alignment with billing cycles additionally creates challenges with customers who are billed via different tariffs, such as assessed or estimated bills.

Reporting measured consumption based on billed consumption results in demand from void properties being reporting in minor components, within water taken illegally or legally unbilled.

Smart meters on customer supplies provide a much better opportunity to record consumption without the need for accruals and without the need to make assessments for consumption when it is not known if a property is void or not.

They also provide a way of better understanding continuous flow. The current method is unable to make best use of the availability and frequency of this data.

[13] PR24 PCC Performance Commitment Definition
[14] PR24 Business Demand Performance Commitment Definition

Metered data includes consumption, plumbing losses and (where the meter is externally fitted) Customer Supply Pipe Leakage (CSPL). This means that estimates and adjustments have to be made to allocate these components correctly.

Measured data is subject to meter under registration and therefore requires adjustment to convert meter readings to an estimate of actual water delivered.

Non-household billing is derived from data in the Central Market Operating System (CMOS) for all companies in England. This requires engagement with retailers who in turn are required to submit meter reads to the system at regular intervals. We understand that some meters are not read with sufficient frequency which results in greater uncertainty.

The current guidance does not adequately incentivise the use of more frequent or granular data where it is available.

4.1.3 Options considered

Do Nothing	The current situation is well managed, appropriate and proportional with the billing led approach.
Base the measured consumption on water delivered to the property.	Directly use smart meter reads to quantify the volume of water delivered from 1st April – 31st March in each financial year. The same approach is proposed for households and non-households, including bulk meters where they are read daily.
Water delivered for households and CMOS for non-households	Align consumption in the retail market and water balance, retain the billing approach exclusively for non-households.

4.1.4 Preferred option

Ofwat's position remains that the best data available should always be used in leakage calculations. All properties fitted with a meter should be included within measured consumption regardless of billing status or occupation (for example, this includes properties where a meter is fitted, but the bill is paid based on an assessed charge or rateable value and includes periods where the property is void).

Consumption should be calculated using the meter reads that best align with the relevant financial year. The paragraphs below set out the process for properties (household and non-households) fitted with smart meters, AMR meters and manually read meters:

- Properties with a smart meter (that provide a minimum of a daily read) should use readings from midnight on the first day of each reporting year to midnight on the last day of each reporting year. Where data is unavailable this should be infilled with adjacent reads, nearest to the start and end of the reporting year. The uncertainty due to the impact of the meter reads not coinciding with the reporting year should be included within the reported measured consumption for this cohort.
- Properties with an AMR meter should use the nearest readings to the start and end of the financial year. The uncertainty due to the impact of the meter reads not coinciding with the reporting year should be included within the reported measured consumption for this cohort.
- Properties with a manually read meter should continue to be read no less frequently than twice per year. The uncertainty due to the impact of the meter reads not coinciding with the reporting year should be included within the reported measured consumption for this cohort.

Companies will still be required to make adjustments for Meter Under-registration (MUR although as smart meters will be newer the overall level of MUR will be expected to reduce).

Adjustments may be required for customer supply pipe leakage (CSPL), see section 8 of this document.

4.1.5 How quickly could this be implemented?

The change would not result in any new hardware requirements and little specialised software. The accuracy of the method will naturally improve with the increase in numbers of smart meters installed.

However, this would be a meaningful and impactful change in process for many companies which may require 1-2 years for implementation. Figures could be back calculated if necessary.

4.1.6 Consultation questions

Q4.1. Do you agree that removing the requirement to directly use billing data and measure the water delivered to properties would improve the accuracy and consistency of the water balance?

Q4.2 Can you identify any particular concerns with this proposed approach?

5. Unmeasured consumption

This component covers the reporting of households and non-households where there is no meter fitted.

5.1.1 Summary of current position

Unmeasured consumption primarily represents the consumption of household customers without a meter fitted to the property's supply.

For companies with fewer smart meters installed, it will be a significant component of the water balance. Indeed, for some companies, the household unmeasured consumption is the largest consumption component in the water balance.

Unmeasured consumption will steadily reduce as the number of smart meters installed increases. However, it is recognised that even when smart meter roll out is substantially completed that unmeasured consumption will need to be assessed as for a small number of customers, as it will not be possible to install smart meters at all customers. At this time, unmeasured consumption on non-households should however be a relatively small component of the water balance.

The requirements for reporting unmeasured consumption are set out within the definitions of the PCC[15] and business demand performance commitments[16].

5.1.2 Potential concerns regarding current approach

Companies have set up monitors to calculate unmeasured consumption on households; these can be individual household monitors (IHMs) or small area monitors (SAMs). Selection of a sufficient number of properties to be representative of the overall population of unmeasured consumption can be difficult, especially for those companies with high levels of customer metering.

Similarly, ensuring the sample is representative, not skewed and takes account of both large unmeasured consumption and nil consumption can be hugely problematic. The impact of a few exceptionally large unmeasured users will have a large detrimental impact on the accuracy of reported leakage.

[15] Per capita consumption – PC definition - Ofwat
[16] Business demand – PC definition - Ofwat

Some companies, particularly those in less water stressed areas, are now installing meters at properties occupied by unmeasured customers. Similarly, many companies are installing smart meters with an extended window of up to two years where customers may remain on an unmeasured bill. The current framework does not effectively make best use of this data and leads to a large uncertainty on the consumption of customers that are effectively smart metered.

The current methodologies of using IHMs and SAMs are necessarily reliant on complex estimation and modelling. It has become challenging for some companies to maintain existing monitors due to:

- Higher bills prompting customers within IHMs to request a meter.
- Rising meter penetration leaving a smaller sample of unmeasured customers.
- Increasingly fewer SAM suitable areas having less than 50%-meter penetration due to both optants and proactive metering.
- Potential bias in the residual unmetered properties, for instance they could be difficult to meter because they are flats.

Much of the existing guidance is now dated, makes poor use of modern data sources, is overly reliant on SAMs and IHMs and isn't reflective of good statistical practices.

The current approach also means that it will be very challenging to move the final proportion of customers into measured cohorts.

We recognise that reconciling billing data with property data can be problematic and that a number of 'void' properties need to accounted for. This may introduce further uncertainty to the water balance calculation.

There are additionally a small proportion of unmeasured businesses. Whilst this is a small volume, current requirements are minimal, and there is inconsistency in how this consumption is quantified.

5.1.3 Options considered

Do Nothing	The current approach has been in place for many years and is well understood. Since this component is going to decrease for almost all companies, extensive changes are unnecessary.

Report using individual meters not within an IHM	Allow the use of any individually metered property that is not on a measured bill to be used for quantifying unmeasured consumption, subject to suitable methodologies.
Bulk metering of customers who cannot have a meter fitted.	Use smart bulk meters to measure the consumption of customers who cannot have a meter fitted (for example customers with a shared supply or blocks of flats). This allows property consumption to be measured more directly and significantly reduces the number of unmeasured properties.
Update current approach	Retain a similar approach but updated methodologies to better reflect the current unmeasured estate and use modern data and statistical techniques.
Quantify unmeasured consumption based on PCC	Reflecting that consumption is heavily impacted by occupancy, calculate PCC from available monitors and use PCC to predict unmeasured consumption (instead of PHC).
Improved unmeasured NHH guidance	Greater guidance governing the estimation of unmeasured business demand, with a proportional reflecting the size of the component.

5.1.4 Preferred option

The preferred approach would be to:

- Install smart bulk meters on properties that are on a shared supply (including flats) and then measure the volume delivered to this cohort using the meter reads that best align with the relevant financial year.
- For properties that cannot be metered directly or via a shared supply, the consumption should be quantified using a similar approach to the current method.

Companies will still be required to make adjustments for Meter Under-registration (MUR), see section 11 of this document. Adjustments may be required for customer supply pipe leakage (CSPL), see section 8 of this document.

5.1.5 How quickly could this be implemented?

The changes in classifications and calculation could be initiated very quickly within a year, however the long-term reduction in uncertainty and reducing truly unmeasured consumption may take 5-10 years based on metering positions, particularly where bulk metering is required.

5.1.6 Consultation questions

Q5.1. Do you agree that bulk metering could cost effectively improve the quantification of this component?

Q5.2 Do unmeasured customers with a meter that are outside of a traditional monitor have a role in reporting the consumption of truly unmeasured customers?

Q5.3 Do you agree that inclusion of void periods in the volume consumed by properties would be an improvement to the calculation of consumption?

6. Upstream leakage

6.1.1 Summary of current position

Bottom-up leakage is a significant component of the England and Wales leakage calculation. It consists of distribution leakage which is dealt with in section 7 and trunk main and service reservoir leakage (referred to as upstream – as it is upstream of the DMAs).

The extent of trunk main and service reservoir leakage varies based on the reporting level chosen by the company. Subsequently, for companies with long length of mains 'upstream' of DMAs it is a major component of total leakage. For those who report on larger DMAs or incorporate trunk mains into their 'downstream' reported upstream losses could be small or even nil.

The requirements for reporting this component are set out within the PR24 leakage PC definition PR24 leakage PC definition[17] .

6.1.2 Potential concerns regarding current approach

Other than the S36.4 of the Water Industry Act 1991 defining a "distribution main" as "a water main that is not a trunk main" there is no industry standard definition of a trunk main. Some companies define trunk mains by diameter and some by strategic importance.

It could be argued that the Burst and Background Estimation (BABE)[18] allowance approach in reporting upstream leakage has not incentivised companies to take a more proactive approach. There may be a number of reasons for this. It may be in part due to lower cost of the BABE allowance approach or that metering on the trunk main system is missing or not validated and therefore companies lack confidence in any balances.

At PR24 Ofwat signalled that companies should move away from using BABE in favour of more proactive approaches. Ofwat did not specify that this should be flow balances, preferring to allow companies to consider alternatives, but flow balances appear to be the most logical approach, The requirement to move from using BABE, in particular not to revert to BABE for

[17] Performance commitment definition - Leakage

[18] Bursts and Background Estimation as set out in Managing Leakage 1984. The BABE approach in trunk main leakage is an estimation of the losses from an average leak and an assessment of the number of leaks per km of trunk main.

an area that has previously been reported using flow balances, is now part of the PR24 leakage PC definition[19].

6.1.3 Options considered

Revert back to allowing BABE estimation approach	The current approach has been in place for many years and is well understood. However, Ofwat has already signalled that we expect companies to move away from a BABE approach and use a volumetric approach.
Extrapolate from a representative sample of upstream balances	Allow companies to use an approach to that is used by some companies and expect a high degree of accuracy on a few areas and then extrapolate from these samples to cover all upstream areas. Use modern data and statistical techniques.
Strategic Upstream Balances (SUB)	Expect companies to establish and report using simple upstream balances. Install and verify the accuracy of meters as necessary in order to provide a calculation to reasonable accuracy.
Upstream Flow Monitoring Zones (UFMZ)	Develop the SUB concept further and establish more granular upstream water balances using tiles or UFMZs in accordance with UKWIR best practice. Allow companies that already have UFMZs to report using them

6.1.4 Preferred option

Companies should as a minimum establish strategic upstream balances in accordance with the Atkins Realis [20] report that has supported this leakage methodology review. Companies with UFMZs should report using them.

[19] Performance commitment definition - Leakage
[20] Ofwat-Upstream-Losses-Report-Final-v2.0.pdf

6.1.5 How quickly could this be implemented?

We understand that most companies have metering and monitoring in place which would enable those balances to be set up quickly. However, there would need to be a phased change from existing to new methodology to allow the companies to validate those balances and to ensure metering is of sufficiently high quality and accuracy in order to improve the reported leakage. Meter accuracy is dealt with in Section 11.

6.1.6 Consultation questions

Q6.1	Do you agree with a phased move to strategic upstream balances?
Q6.2	Do you think that we should move directly to the more granular UFMZ or tile approach?

7. Distribution leakage

7.1.1 Summary of current position

Bottom-up leakage is arguably the most important of the leakage calculation and is somewhat unique to the UK from a reporting perspective. It consists of trunk mains leakage, discussed in Section 6, and distribution leakage.

Distribution leakage currently includes an estimate of CSPL. From data provided to Ofwat by the companies, distribution leakage (i.e. not upstream – trunk mains and service reservoirs) is understood to contribute at least 66% leakage reported by the companies.

The requirements for reporting this component are set out within the leakage performance commitment definition[21]

7.1.2 Potential concerns regarding current approach

The current methodology, particularly regarding night use is heavily reliant on modelling, assumptions and estimations, preventing the water balance from becoming a measured calculation.

The methodology is poorly suited to making best use of smart meter data.

Some of the definitions are open to interpretation and there are a wide variety of inconsistent approaches used.

All data used in the calculation is collected at night during low flow periods and therefore subject to meter inaccuracy and Meter Under Registration (MUR).

Some elements of the requirements are outdated with many companies already using more sophisticated approaches.

[21] Performance commitment definition - Leakage

7.1.3 Options considered

Do Nothing	The current situation is well managed and tested. Smart meters can be accommodated within the existing MNF approach.
Adopt a smart meter hybrid methodology for DMAs with low proportions of smart meters (e.g. less than 80%) and a full integrated flow balance for those with greater than 80%	Use a smart meter driven approach to calculating night use in individual DMAs, uplifted based on the percentage of the DMAs that are smart metered, following the framework presented in the Artesia/HRW report[22]. Then, as the proportion of meters in a DMA exceeds 80%, use a fully integrated flow method to calculate leakage.
Use exclusively smart metered allowances to calculate night use in a MNF calculation	Use smart metered methods as above, but with no role for existing night flow monitors.
Use 24-hour DMA/area balances as an alternative to the night flow analysis	Use a 24-hour window, conducting daily DMA/zonal water balances using more accurate metered data, as proposed Sheffield University

7.1.4 Preferred option

Two possible solutions are being considered:

- A hybrid smart meter methodology, initially supported by existing monitors. This is effectively a permanent implementation of the transition bottom-up methodology outlined in the Artesia/HRW report (Section 5.3.4). or;
- A 24-hour mass balance approach as proposed by Sheffield University (and referenced for meter penetration ≥90% in the Artesia/HRW report).

[22] Smart Metering and Leakage FWR7380, HRW and Artesia on behalf of Ofwat, 2026

7.1.5 How quickly could this be implemented?

24-hour balances based fully on smart meters within the same DMA or zone could be implemented between 2030 and 2040 depending on companies and regions.

The hybrid method at night requiring only 30% of an area to be smart metered could be applied more quickly in many areas subject to leakage management systems. However, we recognise that some areas may not meet this threshold until 2030 or 2035.

7.1.6 Consultation questions

Q7.1. Do you agree that the distribution leakage methodology should be improved to make better use of smart meters?

Q7.2 Do you prefer the hybrid approach or the mass balance approach? Which do you believe will result in a higher degree of accuracy?

Q7.3 Do you agree that a gradual transition from existing monitors to smart metering is preferrable to a delayed or inconsistent step change?

7.2 Hour to day (HTD) factor

7.2.1 Summary of current position

Within the MNF method for calculating leakage, there is a requirement to account for different pressures in the network at different times of day. It is normal for network pressures to be higher at night, when demand is lower. This is also the time when leakage is calculated. Pressures may also be managed using pressure management systems, which control the pressures dynamically. The Hour to Day (HTD) Factor calculates an allowance to be applied to leakage to account for these pressure changes.

Current guidance is that a company shall take into account the findings from the UKWIR Report 'Assessment of Key parameters for Leakage Analysis' which addresses average zone pressure, average zone night pressure (AZNP) and hour to day factor (HDF). A company is expected to derive the hour to day conversion using the following criteria:

- The hour-to-day factor shall be derived separately for each DMA or zone using pressure logging within each DMA.
- The factors shall be updated at least annually or where there are any significant changes to pressure regimes.
- As an alternative, hydraulic models can be used provided they have been updated to reflect the latest network reconfiguration and any pressure changes, and provided it is dis-aggregated in sufficient detail at sub-zone level.
- An N1 value of 1.0 to 1.2 in the leakage – pressure power law relationship unless a company is able to demonstrate a higher or lower value would be more appropriate using its own data. A company should set out its approach to deriving its N1 value.

The requirements for reporting this component are set out within the leakage performance commitment definition[1]

7.2.2 Potential concerns regarding current approach

The current approach is required for a MNF method when leakage is calculated in the minimum flow period and then converted to a daily figure. However, if a 24-hour balance were adopted, it may become unnecessary.

For a hybrid MNF method where DMAs with fewer than 80% smart meters installed, HTD factors will still be still required. This is because leakage is still calculated at night, when pressures may be materially different to the daily average.

7.2.3 Options considered

Do Nothing	The current situation is well managed, appropriate and proportional.
Improve Methodology	Make the methodology dynamic, such that HTD factors are updated more frequently than current requirement for annual update.
Move to flow balance for Bottom-Up leakage reporting.	Remove the need for HTD factors

7.2.4 Preferred option

There is no clear preferred option. If data is available for more frequent update to HTD factors, then they should be considered. This would depend on the leakage analysis and reporting software and data governance.

If companies were to move away from a minimum night flow (MNF) and conduct balances over a 24-hour period, then HTD factors will be no longer required.

7.2.5 How quickly could this be implemented?

This would depend on the option implemented.

7.2.6 Consultation questions

Q7.4 Do you agree that the current guidance should stay or should HTD factors be updated more frequently than annually?

Q7.5 Do you agree that HTD factors will become entirely obsolete if 24-hour balances are implemented?

8. Customer supply pipe leakage (CSPL)

8.1.1 Summary of current position

Customer supply pipes (CSP) are typically located between the property boundary and where the supply pipe enters the building, most commonly buried beneath a customer's front garden or driveway. Leakage on these pipes is included within water company reported leakage although the pipe is owned by and is the responsibility of the customer.

It is important to distinguish between Continuous Flow and Supply Pipe leakage. Domestic consumption of water will typically be stop-start and will include periods of no flow – i.e. when no water is being used. Smart meters can help companies to identify 'Continuous flow', which may be legitimate use, for example irrigation systems. However, continuous flow is often indicative of a loss or waste of water. Any losses on the pipe between the distribution main and the customer premises are referred to as 'Customer Supply Pipe Leaks' and any losses within the building, for example leaky loos' are referred to as 'plumbing losses'

Emerging studies suggest that between 20% and 33% of all distribution leakage is on Customer Supply Pipes[23].

We are aware of the considerable divergence in the company approaches to CSPL both in terms of identifying and quantifying CSPL and the flow rates and length of time that the company observes continuous flow before engaging with customers.

The majority of customer meters are installed in external boundary boxes. In these cases, the water lost to CSPL is measured by the meter. In the case of meters located at the property wall or inside the property, all the volume registered by the meter is recorded as consumption and contributes to Per Capita Consumption (PCC).

CSPL is relevant both to the calculation of bottom-up leakage in impacting night use, and the calculation of overall customer consumption. The performance commitment definition for per-capita-consumption sets out that the company shall:

- take account of supply pipe leakage in the estimation of both measured household consumption and unmeasured household consumption;
- use its own estimates of supply pipe leakage which are annually updated; and
- demonstrate how these estimates have been derived.

[23] AR1695-CSPL-and-PL-Reporting-and-Definitions-Final-Report-240426.pdf

It is also stated that the information and assumptions for this component should be consistent across the three demand performance commitments.

More recently some companies are able to quantify CSPL using smart meter data but historically it has been estimated using either:

- Burst and Background Estimation
- Extrapolation of surveys of individual properties.

8.1.2 Potential concerns regarding current approach

External meters currently measure CSPL, plumbing losses (PL) and customer usage. Therefore, even with high resolution data it is not possible to isolate the leakage component, resulting in uncertainty and inconsistency for both the top down and bottom-up water balance.

Given the increasing evidence that this represents a significant proportion of reported leakage, the current methodologies and requirements for estimating and reporting CSPL are not sufficient.

They are overly reliant on modelling, estimates and assumptions. Many of the methods rely on limited sample sizes and/or are not statistically robust.

8.1.3 Options considered

Do Nothing	The current situation is well managed, appropriate and proportional, or changes to definitions would be costly with limited benefits.
Redefine CSPL and/or plumbing losses	Reclassify continuous flows, according to one of the following options: 1) All water delivered (including continuous flow) is defined as consumption (with no adjustments for meter position). 2) All water delivered (including continuous flow) is defined as consumption, with CSPL estimates added for internally metered properties.

	• All continuous flows (including plumbing losses) are defined as leakage; consumption is then water delivered minus continuous flow.
Report continuous flows as a new component.	Definitions of CSPL remain as current, require companies to report measured continuous flows (CF). This would require the development of a consistent definition defining the flow threshold and duration.
Research methods of identifying and differentiating continuous flow as either legitimate use or leakage.	Definitions of CSPL remain as current, and commission research and/or set out requirements on how to split the components of continuous flow for reporting CSPL and plumbing losses.

8.1.4 Preferred option

The definition of consumption, plumbing losses and CSPL should remain unchanged.

CSPL should be reported using high resolution flow data from individually metered properties. A new standard or guidance should be developed which all companies should follow.

Companies should adopt a consistent approach to identify how to interpret smart meter data and to distinguish between consumption, plumbing losses and CSPL.

Total volume of continuous flow should be identified from smart meter data and separately reported.

8.1.5 How quickly could this be implemented?

Relevant standard definitions could be developed quickly, and companies could potentially report consistently during this AMP period. However, we recognise that research into splitting out using CSPL from PLs and other continuous flows will require further research and time.

8.1.6 Consultation questions

Q8.1 Do you agree that a more robust and consistent methodology for calculating CSPL is required?

Q8.2 Would you support the introduction of a standardised definition of continuous flow, exclusively for regulatory reporting?

Q8.3 Do you believe Ofwat should prescribe a methodology for splitting continuous flows into consumption and leakage?

Q8.4 Do you believe that CSPL and/or PL should be reclassified such that leakage and consumption can be better quantified using externally installed meters?

9. Minor components

9.1.1 Summary of current position

Minor components include the following:

- Company own water use
- Distribution system operational use
- Other water taken legally
- Water taken illegally.

The requirements for reporting these components are set out within the leakage performance commitment definition

9.1.2 Potential concerns regarding current approach

The definition and limits of minor components and the ODI targets set on other components of the water balance incentive companies to maximise accounting for water use in minor components.

The key concern with this data is the high degree of uncertainty associated with it. This reflects in the water balance where we understand uncertainties of between +/-20% and +/-50% are used.

We recognise that the costs for additional data collection and lowering uncertainty may not be an efficient use of resources.

It is not clear how consistent the evidence base is for some of the data provided in companies' water balances nor how regularly it is updated.

There are differences reported by water companies, which are not well explained.

9.1.3 Options considered

Do Nothing	Given the size of the components, further data collection and stricter requirements would not be efficient, therefore no change is required.
Stricter Requirements and further data collection	These minor components will still play a role in the calculation regardless of other changes, so it is important that reliable estimates are used. Requirements should become stricter with greater evidence required to support this component. All companies should be required to periodically update their data and should use data specifically collected within their supply system.

9.1.4 Preferred option

Ofwat proposes no changes to the definitions or approaches to any of these lines but proposes that when WRMPs (or the new planning frameworks that are being developed) are produced, the evidence base used by water companies is re-assessed to better establish the volumes of water used in these minor components.

9.1.5 How quickly could this be implemented?

We are not proposing any material changes, other than that companies provide further information as part of the options appraisal in their WRMPs.

9.1.6 Consultation questions

Q9.1. Do you agree with the proposed approach that there should be no changes in guidance for reporting minor components?

10. Uncertainty and MLE reconciliation

10.1.1 Summary of current position

In the Top-Down Bottom-Up methodology leakage is estimated in two ways. There is an inevitable, but hopefully small, difference in the two estimates (referred to as the Water Balance Gap). The principle of the MLE reconciliation is to make small but justified adjustments to each of the components of the water balance to close the water balance gap. These adjustments are in made in proportion to both the size of the component and the uncertainty with which it is measured.

The uncertainty on the water balance components can therefore have a significant impact on the water balance. It is expected that the larger components (such as Distribution Input) are measured with lower degrees of uncertainty than the smaller components (such as water taken legally or illegally whether billed or unbilled)

In the Leakage PC definition Ofwat sets expectations that confidence intervals will fall within specific ranges based on the methods used to derive components, however the methodology used to calculate these is not prescribed.

10.1.2 Potential concerns regarding current approach

Each of the companies assesses the uncertainty associated with each of the components in their water balance. Each of these components and the uncertainties are subject to independent assurance. However, we note that for some components the companies view of uncertainty vary significantly.

Of most concern is the range of 8% to 25% in the confidence intervals associated with bottom-up leakage estimation. Given that the methodology for assessment of bottom-up leakage is well developed and understood, this level of variation is not expected.

Since companies are broadly free to apply their own approaches and methods, there is widespread inconsistency in the approach and values derived. Many companies use standard values that have been in place for many years.

Since many companies continue to have water balance gaps of more than +/-2%, the adjustments made by small changes in uncertainty can have a substantial impact when MLE is applied.

10.1.3 Options considered

Do Nothing	The current approach works well and is proportional, with water balance gaps expected to close naturally over time.
Remove Reconciliation	Do not reconcile the top-down and bottom-up reporting methods, with the top-down method being reported.
Tighten existing requirements	Provide further guidance on the calculation of confidence intervals such that are figures are accurate and consistent.
Improve metering standards	Maintain the existing requirements but introduce new standards for metering to better manage this major source of uncertainty.
MLE alternative	Continue to reconcile the top-down and bottom-up water methods, with an alternative method that improves on the MLE

10.1.4 Preferred option

We would prefer to continue with the existing MLE approach reconciliation, with clearer and tighter requirements for the calculation of confidence intervals.

The uncertainty ranges used within the MLE should be reviewed and more guidance provided, based on statistical assessments of uncertainty in the calculations.

10.1.5 How quickly could this be implemented?

This would be a small desk-based change to the methodology and could implemented within a year.

10.1.6 Consultation Questions

Q10.1 Do you agree with the decision to retain the MLE method and reconciliation approach?

Q10.2 Would you support tighter requirements with regards to confidence intervals and appropriate guidance regarding suitable methods for calculate these?

11. Metering standards and expectations

11.1.1 Summary of current position

All of the components of the water balance are either measured or extrapolated from data gathered by flowmeters. The accuracy of the meter meters is therefore essential to calculating an accurate water balance and deriving a leakage estimate.

The water sector 'standard' for flow metering has for some time been the Environment Agency's Abstraction Metering Good Practice Manual. This document is referred to in the leakage PC definition.

We understand from colleagues in the EA and from the authors of the Good Practice Manual that the document is currently under review and it is unlikely that a revision will be published.

There is no link to the document on the EA website but there is a link to a copy of the document on Ofwat website.

This document sets out expectations for the installation, maintenance, calibration and verification of abstraction meters. The requirements for abstraction meters are similar to those for Distribution Input, trunk main and DMA meters.

In terms of customer meters, which are mostly mechanical meters, there is additionally a requirement to calculate meter under-registration (MUR) where there is believed to be a systematic bias. The leakage PC definition provides some guidance in this area, and most companies have converged on a consistent approach using independent testing facilities to justify the levels of meter under-registration they apply in their water balance.

The overwhelming majority of customer meters sold in the UK will be manufactured and compliant with BS EN ISO4064[24], with related standards for the remainder and historic standards prior to its publication.

[24] BS EN ISO4064: Water meters for cold potable water and hot water, 2025

11.1.2 Potential concerns regarding current approach

Whilst meters sold in the UK are of a good quality and compliant with international standards, many are now old and some have been poorly maintained. The picture in terms of installation, maintenance, monitoring and proactive replacement is mixed.

Across the water sector there are areas of excellent practice in terms of metering, but also areas where improvements should be made.

These differences may result in inconsistency and unidentified errors in the reporting of key water balance components.

11.1.3 Options considered

Do Nothing	The current approach works well and allows companies the freedom to choose their own approach.
Require compliance with metering best practice	Commission best practice guidance for the use of meters in the clean water network, with mandatory adoption for water balance reporting.

11.1.4 Preferred option

Our preferred option is the development of a standard for the managing of the metering assets throughout their whole lifecycle, that companies would be required to adopt. This would be a 'source to tap', 'cradle to grave' meter manual as a replacement for the Abstraction Meter Good Practice Manual. Such a standard should set out expectations for companies to specify, install, maintain, ensure the accuracy of and replace end of life assets. The standard should set out expectations for the accuracy of data from the primary meter and how that accuracy is assured wherever data is used in regulatory reporting.

We note that the development of such a standard would run in parallel to, but would be separate from, the development of a new leakage reporting methodology.

The scope of requirements, potential procurement exercise, and the incentive for adoption are emerging areas and this is likely to follow this consultation on leakage reporting.

11.1.5 How quickly could this be implemented?

Developing best practice could take up to two years, with companies beginning to adapt in the following years.

11.1.6 Consultation questions

Q11.1 Do you agree that further requirements would efficiently encourage consistency and best practice on the use of meters?

Q11.2 Do you agree that the sector requires a replacement for the Abstraction Meter Good Practice Manual?

Q11.3 Do we need to and if so, how should we incentivise companies to improve their meter assets?

12. Reporting frequency

12.1.1 Summary of current position

Companies generally calculate recent leakage levels on a regular basis to their own management and their own Board. This may be in the form of a weekly operational report (for instance to identify DMAs with high leakage), with monthly or quarterly dashboards presented to senior management. It is understood that these operational leakage reports will necessarily contain some assumptions (for example seasonality in night use) which can only be corrected for regulatory reporting once a full year's data is available. It is possible that with more granular data (e.g. smart meter data) that these operational leakage reports will become increasingly more accurate and timely.

In general, water companies are required to report leakage annually to Ofwat in the APR. In some cases (e.g. where companies have failed targets) Ofwat may require companies to provide more frequent updates, and to provide regular updates to customers via their company websites.

12.1.2 Potential concerns regarding current approach

Annual reporting to Ofwat provides an assured figure which is a company's best estimation of leakage in the prior 12 months. It takes into account matters such as accruals in measured water delivered. However, some of the changes outlined in this document may make more frequent estimates of top-down leakage possible.

Many companies will have a better understanding of consumption and leakage on their network on a daily and weekly basis, albeit with caveats for assumed data.

Leakage targets are annual average figures but have an impact on within year levels of service (such as high demands during summer weather).

Leakage is both an operational and regulatory matter. Ofwat would like greater confidence in within-year leakage reporting and wants companies' operational and regulatory calculations to be consistent. This means for instance that robust within year figures can be produced that are consistent with out-turn annual average data.

The proposed methodology improvements would allow water companies to calculate and report leakage more frequently, and more consistently, than current methods allow. This would allow regulators to have a better understanding of how well a company is managing leakage during operational events such as droughts and high demand periods.

12.1.3 Options considered

Do Nothing	The current situation is well managed, appropriate and proportional, with companies deciding their frequency of internal reporting. Higher frequency reporting would lead to challenges where components are updated infrequently.
High Resolution	All companies are required to report rolling 12-month water balances at a set frequency (e.g. Monthly, Quarterly)
Performance Related	Only those companies failing to meet targets or where levels of service are at risk, are required to report leakage at a higher resolution.
Drought/Incident reporting	Whilst annual reporting remains, companies may be required to report at a higher resolution during specific periods determined by the regulator.

12.1.4 Preferred option

All companies must continue to report leakage annually.

The preferred option is that water companies should be responsible for their own internal calculation of leakage, but they should ensure that those internal figures represent the best available data, including data from smart meters.

Ofwat recognises that for companies with recent levels of service issues and/or a finely balanced water supply situation the changes to any methodology should enable those companies to report leakage more frequently. We recognise that companies are required to provide assurance for any regulatory reports and recognise the challenges that more frequent reporting may pose. Equally, we continue to expect regular updates and prior warning of emerging risks (e.g. risk of missing a leakage performance commitment) which may affect stakeholder confidence.

12.1.5 How quickly could this be implemented?

Many companies would struggle to implement this immediately, with customer consumption in particular being more challenging to calculate regularly.

12.1.6 Consultation questions

Q12.1 Do you foresee any concerns aligning annual reporting with in-year reporting?

Q12.2 What issues do you see if Ofwat requires companies which are failing to meet levels of service, providing more frequent leakage data?

13. NAVs

13.1.1Summary of current position

The existing reporting guidance applies exclusively to the wholesale water companies in England and Wales. It does not apply to new appointments and variations (NAVs). When the existing guidance was written, NAVs were an emerging area, with a small number of sites with relatively small numbers of properties.

NAVs have become increasingly prevalent in recent years, with the number and size of sites increasingly rapidly. The largest NAV now accounts for more than 150,000 properties and NAVs are forecast to account for 700,000 customers by 2030. However, it must be recognised that this is split across many sites, with many locations having only a few hundreds of customers.

NAV appointments are made on the basis of 'no worse off' in England and 'Better than' in Wales.

13.1.2 Potential concerns regarding current approach

The key concern is that we have separate reporting guidance for the water companies (the incumbents) and the NAVs. We are expecting incumbent water companies to deliver increasingly accurate and robust leakage calculations, whilst at the same time a larger proportion of water supplied to customers will be delivered by NAVs and may be subject to a different, less robust, reporting methodology.

We want to ensure that NAVs and incumbents have a similar reporting methodology without placing un-necessary regulatory burden on the smaller NAV companies.

Ofwat is currently undertaking a review of reporting requirements for NAVs, however we have considered some changes within this consultation.

13.1.3 Options considered

Do Nothing	The current situation is proportional, considering most NAV sites are small with newer and typically lower leakage networks.

Full compliance for NAVs	All NAVs to complete a top-down and bottom-up water balance to the same requirements as wholesale water companies.
Top-down reporting	NAVs are required to complete a top-down water balance at site level. This is expected to be relatively simple given network configuration and metering prevalence.
Simplified Reporting	Develop separate, simplified water balance requirements for NAVs.
Size requirements	Different reporting requirements for NAVs based on the size of individual sites.

13.1.4 Preferred option

The preferred approach would that be NAVs with sufficient levels of meter penetration to complete a top-down water balance for all sites on at least an annual basis, with simplifications for very small areas.

We are aware of a small number of NAV areas with low meter penetration, if these are larger than a threshold to be agreed the NAV would be expected to use the same Top-Down Bottom-Up reporting methodology. The need for this approach would be avoided were the NAV to meet the threshold for meter penetration in their supply area.

13.1.5 How quickly could this be implemented?

Given the high level of customer metering in place at NAV sites, we believe that most NAVs could comply with the key principles of the top down methodology relatively quickly. More complex nuances on specific sites may require several years before compliance can be achieved.

13.1.6 Consultation questions

Q13.1 Should NAVs be subject to tighter water balance reporting requirements in a way that is proportional but consistent with that detailed in this document?

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

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