

December 2019

# PR19 final determinations

**Thames Water – Cost efficiency additional  
information appendix**

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## **PR19 final determinations: Thames Water - Cost efficiency additional information appendix**

# 1 North East London Resilience enhancement programme

## 1.1 Our draft determination

Thames Water has requested investment of approximately £350 million over the 2020 to 2030 period to improve the resilience of water supplies in North East London. This programme consists of the following elements:

- Pre-treatment for algae at Coppermills water treatment works (WTW);
- Removing the single-point of failure at the high-lift pumping station at Coppermills WTW; and
- Development of a new water treatment works with associated water transfer and storage infrastructure.

In our draft determination we allowed funding for the algal treatment and duplicating the pumping station as we considered the evidence sufficient based on the materiality of the investment. We did not provide funding for the new water treatment works based on the evidence provided relating to the risk of losing the entire Coppermills WTW. We recognised the significant consequence of losing water supplies from Coppermills WTW across North East London. In our draft determination feedback we challenged the company to present this risk in the context of a company-wide risk management process and present sufficient evidence that, above all other risks it is facing, this is a priority considering the likelihood of these events. The company had not illustrated how the current proposed plan represents the best value to customers overall considering potential future investment across London and elsewhere.

At draft determination we considered the high-lift pumping station and the new water treatment work, with storage and conveyance infrastructure, to be suitable for our direct procurement process.

## 1.2 Stakeholder representations

In its representations in August 2019 Thames Water clarifies that its plan ensures system redundancy at a site level, building in additional resilience over that conventionally provided within a site by, for example having multiple process streams. Thames Water had opportunities to provide further information after August 2019 but it does not provide a systematic and quantitative analysis that prioritises risks and determines an optimal basket of interventions to ensure company-wide

resilience. We are particularly concerned that Thames Water has two systems of identifying and prioritising resilience risks, and its approach was insufficiently quantitative.

Thames Water re-submitted both its April 2019 business plan and an alternative plan in its August 2019 representations. In October 2019 Thames Water confirmed that it wished to be judged on the basis of the new plan submitted in its August 2019 representations to the draft determination, rather than its April 19 plan. In this plan Thames Water does not include the cost of the planned investment on the new water treatment works in the 2020-25 period. This was deferred until the 2025-30 period.

In late evidence it submitted, Thames Water clarifies that its systematic assessment of resilience that it uses to derive capital maintenance needs does not include 'black swan' type risks, ie arising due to totally unexpected events with profound consequences. Thames Water sets out that it considers the risk of losing an entire water treatment works as a 'black swan' event and on this basis Coppermills WTW does appear to be the highest risk site and thus the priority for investment as it is amongst Thames Water's largest treatment works and there is limited ability to mitigate its loss.

### **1.3 Our assessment and reasons**

Whilst we can see the logic in how Thames Water arrives at the position of distinguishing between maintenance and resilience risk, we consider that Thames Water's approach to resilience may not effectively mitigate risk. Firstly, it does not sufficiently evidence why the risk of losing an entire treatment works is a priority item above other risks, such as a trunk main failure. Further, we consider that it cannot effectively address the risk of losing an entire treatment works without considering the cause of the failure. For example, the loss of the entire site can occur due to, say, flooding or multiple simultaneous failures of operational assets, and these causes will have specific mitigations with varying levels of costs and benefits. Whilst they could be mitigated through duplicating water supply capacity elsewhere, Thames Water does not evidence that this is the most effective option when compared with other possible mitigations.

We consider it appropriate that Thames Water re-evaluates the costs and benefits of its proposed resilience investments within a more systematic framework and expedites the implementation of solutions where necessary. As there is an interaction with the mitigations to risks on the site, i.e. duplicating the works may reduce the consequence of high levels of algae, therefore we require Thames Water

to re-examine all investments at Coppermills WTW, even those that we allowed funding for at draft determination.

We also consider that the risks that Thames Water identifies may present some serious risks to water supply and if following further scrutiny, they are confirmed to be so serious, we are not convinced that delaying investing to mitigate them until the 2025-30 period is in the best interest of customers. At the 2 October 2019 representation meeting Thames Water provided further evidence which highlighted potential risk associated with Coppermills treatment works. This confirms our view that it is not appropriate to delay considering investment to improve resilience in this area until the 2024 periodic review. It also further highlights the need for Thames Water to reconsider its risk management approach including its two separate resilience identification systems and its decision to categorise total water treatment works failure as 'black swan' events.

## **1.4 Our final decision**

We are intervening to put in place a gated process to ensure a systematic review of resilience and options for addressing risks to resilience. In terms of setting the priorities for investment we do not consider that it is appropriate to have a separate analysis of lower probability risks, as Thames Water proposes in its recent evidence. The scope of the review should consider the full range of resilience shocks to the abstraction, treatment and distribution of drinking water across the Thames Water region.

We are making a conditional allowance of £180 million to investigate risks to resilience and the mitigation of risk to water supplies in North East London under resilience enhancement in 2020-25 in our final determination to fund this review and potential interventions that arise from it. Thames Water will face greater scrutiny on this allowance than would normally be the case. We will return the allowance to customers unless Thames Water demonstrates that it understands the challenges facing its treatment resilience produces a well thought-through plan in a defined time frame with clear and measurable deliverables and identifies, and commits to new performance standards that capture, likely benefits to performance from any planned work.

The conditional allowance is based on the delivery of a planned programme of work, with outcomes and outputs, through a gated-process to investigate risks to resilience and the mitigation of risk to water supplies in London. The allowance is conditional on progression through the gates to our satisfaction. The allowance at each gate is based on value of the work completed to our satisfaction. The allowance will be

subject to a customer protection mechanism to ensure high quality and timely delivery. We will return the full allowance, or part of the allowance to customers through an end of period reconciliation. Where the conditions of the first gate are not met we will return the full £180 million allowance.

Our approach will complement the company's organisational capacity building it plans and explains in its Resilience Action Plan.

Overall the gated-process covers an estimated investment of £350 million with a potential delivery timeline across the 2020-25 and 2025-30 price control periods. The estimate is based on the Thames Water's business plan submitted in April 2019, however we expect Thames Water to fully re-evaluate its plans in this area. The value stated should not be seen as a target budget.

#### **1.4.1 Process gates: Planned programme of works and expected outcomes**

The process requires the company to deliver an agreed scope of work in the period 2020-25 to progress through a series of gates. We set out in Table 1.1 the scope of an initial gate, the objective of which is to agree the scope, timing and associated funding of the subsequent gates. Table 1.2 illustrates our expectations for the remaining gates although this is for the company to define and subsequently agree with us.

Consistent with our draft determination we expect Thames Water to consider the suitability of any programme of work for our direct procurement for customers (DPC) approach. Gates two and three provide the possibility of entry to the direct procurement for customers process adopting the early and late models respectively as defined in Delivering Water 2020: Our methodology for the 2019 price review 'Appendix 9: Direct procurement for customers'. We expect the company to exit this gated process after gate four and we will govern the construction and operation of the preferred intervention options through a mechanism agreed at this gate. That is unless the project is halted at a previous gate, progresses through the direct procurement for customers route or we agree any other route for its delivery.

We will confirm the appropriate allowance based on the agreed value of the programme, progression through the gates to our satisfaction and the value of the work completed to our satisfaction. The anticipated investment we associate with gates two to four is £12.8 million and this is based on the Thames Water business plan cost for design and third party engagement for the original scope of works. We do not consider that any additional funding is required for gate one, meaning that if

the company fails to deliver what we require for gate one, we will return to customers the full £180 million allowance.

We define an initial gate, the purpose of which is for Thames Water to define a plan setting out the scope, timing and associated funding of the subsequent gates for agreement with us. The plan should be delivered by the deadline and we will assess the quality of the plan in terms of completeness, clarity and use of best practice from the water industry and other industries, and other factors.

We will assess the remaining gates against meeting this plan. We expect the scope of the work to be delivered under each gate not just to comply with the item but to produce a high quality output for that gate with the intention of producing a high quality output for the project overall. We expect Thames Water to engage with us beyond the formal gates, including progress meetings and draft submissions. In this way we will enable the smooth and timely running of the process, avoiding unnecessary delays.

The gates will provide a formal point to agree inputs into the next stage and for Thames Water to reconfirm the plan with us. Any opportunities we take to amend the plan will be to respond to emerging issues, incorporate new thinking, knowledge and innovation. We do not expect to use them for re-basing performance, for example resetting project milestones.

As discussed previously we are currently not fully convinced of the need for this investment. The output of gate two should include an agreement between Thames Water and us of areas of unacceptable risk that require mitigation. If we consider that the risks highlighted are tolerable, or that evidence is still not persuasive or that the company is funded to mitigate them within existing 2020-25 allowances we will end the gated process and return any remaining funding of the ring-fenced £180 million to customers.

#### **1.4.2 Customer protection and assurance**

We will return the full £180 million allowance to customers if there is a failure to deliver or agree the terms of reference to our satisfaction. Thames Water is required to propose an outcome delivery incentive at gate one to incentivise the timely and efficient completion of the work through the following gates. This will apply an underperformance payment on the value of work to be delivered at each gate for unsatisfactory and/or late delivery. We will review and assess in-period the deliverables for each gate. In the event of a gate not being passed, as we are not satisfied the requirements have been met, we will return to customers the full value

of the allowance expected to be incurred at all future gates through an end of period reconciliation. The final end of period reconciliation mechanism decision will reflect these earlier decisions but will ultimately be taken as part of PR24.

The scale of the underperformance payment needs to reflect the severity of the issue. This is consistent with our gated process for the strategic regional water resource solutions. We do not consider that Thames Water requires additional funding to deliver the outputs of the first gate and thus we will not apply any underperformance payment here. However, should the company not meet the requirements of this gate to our satisfaction, by the time we set, then the process will stop and we will recover the full allowance for customers at the end of the period. We expect the company to evidence that its costs are efficient throughout the gated process. This covers the costs of professional services and capital delivery and may include market testing, cost benchmarking and evidence of internal challenges.

In order to pass gate four, Thames Water must set out a suitable customer protection mechanism and on-going assurance to ensure the company delivers the programme of capital and other interventions. As this will cover the construction activities we expect it to be substantially different to that covering gates two to four. Depending on the scope of works this stage may extend into the 2025-30 period and be subject to scrutiny under the PR24 process.

The company should make use of a third party to assure its submissions. We require the assurers to have a duty of care to Ofwat but Thames Water is responsible for their appointment and fees subject to the on-going approval by Ofwat. We require full transparency of instructions and reporting that aligns with our interest. Should the assurers identify any areas of concern that Thames Water does not address then the assurers should report on their opinion of the materiality of any expected impact on the outcome of the project. If we concur with the assurers that the concern is highly detrimental to the outcomes of the project, we will end the process.

We expect Thames Water's Board to endorse the salient aspects of this project, i.e. setting their risk appetite, for example

**Table 1.1. Scope of work and timeline associated with the initial project stage and gate.**

Stage / Gate	Scope of work	Timeline from FD
1	<p><u>Terms of Reference:</u></p> <ul style="list-style-type: none"> <li>• Outline the available method of resilience assessment based on a review of best practice – and propose a preferred approach.</li> <li>• Set deliverables for future gates and success criteria for passing these gates, timing and funding associated with future gates. Where the funding is dependent on the output of previous gates, i.e. detailed design phase, cost estimates should be given and the process around confirming cost given</li> <li>• Propose customer protection / financial incentives for this gated process, and approach to project assurance</li> </ul> <p>Output for agreement to our satisfaction to pass gate:</p> <ol style="list-style-type: none"> <li>1.) Agree method of assessment as a basis for next stages</li> <li>2.) Agree scope, deliverables, timing and funding requirements for the remainder of the gated process.</li> <li>3.) Agree customer protection / financial incentives and assurance plan for gates two to four.</li> </ol>	30 Apr 2020

**Table 1.2. Indicative scope of work and timeline associated with the remaining project stages and gates.**

Stage / Gate	Scope of work	Timeline: Time to complete from FD
2	<p><u>Initial Evaluation of Unconstrained Options [Coarse screening]:</u></p> <ul style="list-style-type: none"> <li>• Establish and agree the baseline performance for the London water supply system over the current, medium &amp; long term.</li> <li>• Define resilience shocks in each principal risk categories for scenario evaluation (including exogenous factors and those under management control.)</li> <li>• Describe the systematic approach to risk management that the company is taking, -Engage stakeholders on expected performance outcomes &amp; company risk appetite.</li> <li>• Develop an assessment methodology and apply to derive a set of constrained risk mitigation options from an unconstrained list of options. The range of options the company considers to mitigate each of these risks will include reliability, resistance, redundancy, and response and recovery options, and it will assess the residual risk remaining after each option is applied.</li> </ul>	By Sept 2020

	<ul style="list-style-type: none"> <li>• Confirm the need for any investment to address areas of unacceptable risk over and above that included in totex allowance in the final determination excluding this funding.</li> <li>• Complete an initial evaluation of funding &amp; procurement options including a value for money analysis to evaluate the feasibility of the early model direct procurement for customers route.</li> </ul> <p>Output for agreement to pass gate:</p> <ol style="list-style-type: none"> <li>1.) Agree on the areas of unacceptable risk</li> <li>2.) Set of constrained options for detailed analysis in next gate.</li> <li>3.) Initial procurement strategy</li> </ol>	
3	<p><u>Detailed Evaluation of Constrained Options [Fine screening]:</u></p> <ul style="list-style-type: none"> <li>• Undertake more detailed analysis on the constrained options list based on a development of the coarse screening approach as necessary.</li> <li>• Identify the preferred options / optimal basket of scheme solutions</li> <li>• Evaluate funding &amp; procurement options, including a value for money analysis to evaluate the feasibility of the late model direct procurement for customers route.</li> </ul> <p>Output for agreement to pass gate:</p> <ol style="list-style-type: none"> <li>1.) Preferred intervention options for detailed design in next gate.</li> <li>2.) Up-dated procurement strategy</li> </ol>	By Apr 2021
4	<p><u>Detailed Engineering Design</u></p> <ul style="list-style-type: none"> <li>• Complete detailed design of any capital scheme within the preferred development option unless direct procurement for customers route is followed.</li> <li>• Market testing of major cost items &amp; start land procurement preparation as necessary.</li> <li>• Agree the extent of any on-going assurance, customer protection mechanisms</li> </ul> <p>Output for agreement to pass gate:</p> <ol style="list-style-type: none"> <li>1.) Final procurement strategy</li> <li>2.) Detailed scope of works, delivery plan and investment profile, if direct procurement for customers is not the selected delivery route.</li> <li>3.) Customer protection mechanism for delivery phase</li> <li>4.) On-going assurance requirements</li> </ol>	By Apr 2022
5	<p><u>Deliver programme of interventions</u></p> <ul style="list-style-type: none"> <li>• Deliver programme of capital and other interventions</li> <li>• Provide on-going assurance as required</li> <li>• Feed 'lessons learnt' into the 2025-30 plan to complete the work which will be agreed at PR24</li> </ul>	To end of 2024-25 with continuation into 2025-30 period as agreed

## 2 London water network improvement enhancement allowance

### 2.1 Summary

Thames Water is an outlier of poor water network performance in the period 2015-19. This has had material consequences for customers in London in particular. We expect Thames Water to have achieved better outcomes for its customers by now. We consider that inefficient planning and delivery of work contributed to this poor performance, and this was reflected in Thames Water business plan. We acknowledge also that the reason for this may partially lie in the levels of service we asked it to meet in the past. However, more recently the scale and impact of the deficiency in asset health causes us serious concern.

Thames Water does not present a reasoned, evidenced proposition to address the performance issues, and we are concerned about consequences for customers should this not be addressed. Thames Water, like all other companies has four years (once a determination is set) to develop a well thought through plan that sets out clearly what outcomes and improved service its enhancement proposals will deliver for the next review. Thames Water didn't do this for PR19 but we expect it to do so for PR24.

We are including a provision for enhancement funding to allow Thames Water to increase service levels on its water network beyond its historical performance levels. But we are setting a framework that provides for substantially more scrutiny than we would normally apply to company investment programmes. This is to ensure this issue is adequately and promptly addressed. We expect Thames Water to demonstrate that it can plan better and deliver improvements for customers in the performance of its water network in London. Such a plan is an addition to the investment proposals its proposed representation plan and we expect it to present its plan to us within the next 6 months.

We allow up to £300 million of customer funding for investment in 2020-25 in the final determination to improve the performance of the London water network. Thames Water will face greater scrutiny on this allowance than would normally be the case. We will return the allowance to customers unless Thames Water demonstrates that it understands the challenges facing its network, produces a well thought-through plan in a defined time frame with clear and measurable deliverables and identifies, and commits to new performance standards that capture likely benefits to performance from any planned work.

We consider that inefficiency contributed to Thames Water's current poor network performance. In addition to the conditions above, a further condition is that Thames

Water's plan must also include a commitment from Thames Water's shareholders to make a substantial contribution to the cost of the improvement works.

Thames Water is responsible for ensuring that it complies with its statutory and regulatory obligations at all times. Our assessment of Thames Water's plan and our subsequent funding decisions will not take away this responsibility from Thames Water or inhibit us from taking enforcement action where necessary. We expect Thames Water to propose a scope of work and a plan for its efficient delivery, for us to approve. The ownership of the business, risks and delivery remain with the company.

The process requires Thames Water to deliver an agreed scope of work by progressing through a series of gates. Our allowance is verified on progression through a gate and reflects the value of work completed at that gate. Customer protection mechanisms will be required to incentivise the timely and effective completion of the planning and delivery of work. This gated process is similar to that for the strategic water resource schemes but amended to reflect the needs of operations rather than projects. We will confirm the appropriate allowance based on the agreed value of the programme, progression through the gates to our satisfaction and the value of the work completed to our satisfaction. In particular, where the conditions of the first gate are not met we will return the full £300 million allowance for performance of the London water network to customers. We will return the full allowance, or part of the allowance, to customers through an end of period reconciliation where:

- there is a failure to deliver or agree the terms of reference to our satisfaction;
- the programme is not delivered;
- the required programme of work costs less than our final determination allowance, either due to an assessment of efficient costs or reduced scope;
- there is no commitment from Thames Water's shareholders to our satisfaction to make a substantial contribution to the cost of the improvement;
- there are no appropriate changes proposed to our satisfaction to relevant PR19 performance commitments or ODIs; and
- through underperformance payments for unsatisfactory and/or late delivery. In the event of a gate not being passed, because we are not satisfied the requirements have been met, we will return to customers the full value of the allowance expected to be incurred at all future gates.

We make our allowance as enhancement funding, which we assume within the totex we use to calculate the opex capex split. We explain in 'Securing cost efficiency technical appendix' how we assume enhancement funding is allocated between capex and opex in our calculation of pay as you go rates. We will ensure that we return the money to customers in a way commensurate to our final determination

enhancement allowance. This will ensure customers are no worse off from us making an allowance now and then taking it back at the end of the period.

Since its 30 August representation, Thames Water has indicated that it will develop separate reporting to show how it is performing in its London region in 2020-25. We expect the company to think broadly about which measures to report on separately for London and the rest of its region. This should provide a comprehensive and transparent picture of performance. This reporting should cover a full range of outcomes and operational measures – including the separate reporting of key common performance commitments included in the final determination.

The company needs to consider the information its stakeholders need to understand Thames Water's performance in London and the outcomes for customers and the environment. We expect it to consult with relevant stakeholders in the development of London performance reporting. The disaggregated performance reporting should be in place in time to provide transparency of performance for the whole of the 2020-25 reporting period. We will consider the proposed performance reporting as it develops, but expect the company, at an early stage, to share its proposed plan and timetable for delivering this initiative with us and other stakeholders.

Where potential benefits flow from the London water network improvement enhancement allowance and impact on performance commitments set in this final determination, potentially making the performance commitment levels or outcome delivery incentive outperformance payments easier to achieve, we will consider resetting those levels or incentives. This is to reflect the level of stretch and outperformance payment in line with our intention in our final determination. We will consider this and reset as necessary as part of the gated process.

## **2.2 Our draft determination**

Thames Water requested an additional base allowance through the London Water Network cost adjustment claim in consideration of the higher costs of operating its London water network due to factors outside of management control.

Thames Water considers that it requires additional base costs to maintain the performance of the London water network because of London's asset age, soil condition and traffic levels. These, it considers, are all outside of management control. Thames Water considers the London network was in a poor condition at privatisation. The company considers it has maintained levels of renewal commensurate with the rest of the industry and levels of service in its past price controls have not facilitated bringing its performance in line with the rest of the

industry. The company contends it has higher unit costs in London but these costs are efficient. Thames Water considers that our current base models do not account for the factors relating to asset condition albeit population density does account for the unit cost impact of density. Thames Water bases the value of this cost claim on the differential in leakage costs between it and the industry average rates.

We rejected this claim at draft determination because the supporting evidence was not convincing. While there may be merit in the soil conditions component of the claim, Thames Water did not provide convincing evidence to prove that it is disproportionality affected by poor soil conditions through soil corrosivity mapping or field analysis. As the age of network component of the claim is, at least partially, contingent on soil conditions and the historical rate of renewal over the long-term, we could not fully assess this claim due to a lack of evidence. Our models used to set allowances contain the variables number of connected properties, property density and property density squared. We consider that these measures of urbanisation at least partially correlate with the factors highlighted by Thames Water. In particular, we considered the impact from traffic loading to be captured.

## **2.3 Stakeholder representations**

Thames Water provides further information in its draft determination representation it submitted in August 2019. This information, however, was not substantially different from that which it previously submitted, aside from introducing points of weakness as contributory factor in pipeline performance.

Following further engagement we had with the company, it provided a late submission (21 October 2019). In it, Thames Water provides a point by point rebuttal of our challenge. The company provides some evidence that burst rates are correlated to the risk factors it identified, and that these factors do not correlate with population density.

## **2.4 Our assessment and reasons**

Based on the evidence the company presents and our own analysis we were not fully convinced that the performance of the London network is significantly impacted by the factors the company identifies. There still appear to be inconsistencies and shortcomings in the company's analysis. For example the data may be significantly biased by applying a threshold of percentage of mains affected. We recognise that the water network of Thames Water is a clear outlier across the industry in terms of performance. We accept that performance, at least partially, reflects performance

commitment levels in previous periods, legacy network condition, investment and importantly the management and operation of the network.

The scale of the issue is such that we do not think it is in the best interests of customers to wait another five years for Thames Water to provide better evidence, and a proposal to improve. This would mean progress would not begin until 2026 at the earliest. We are therefore stepping in to provide this allowance through a framework of additional scrutiny. This is to ensure that the company has a clear and well thought through plan that demonstrates how it will improve service in the 2020-25 period, protect customers' interests, promote long term asset health, learning and innovation in the company and supply chain.

Our allowance is not aimed at funding Thames Water to achieve its performance commitments already set in PR14 and PR19. We expect a clear delineation of reporting of its outputs and network performance under this framework, reporting on London and the rest of its region separately. We do not necessarily expect companies to achieve common service levels on all network asset health measures or leakage. In previous price reviews, Thames Water was set a lower (but improving) level of serviceability than other companies, meaning for example Thames Water was likely to have a higher number of mains bursts per km of main than its peers' bursts. At PR19 we are setting performance commitments that require improved performance, taking account of good performance in the sector and the company's historical actual and targeted performance. We do not allow poor management in the previous period to result in less stretching performance in the future. We therefore protect customers against risk of 'catch 'up' spend.

## **2.5 Our final decision**

In our final determination we include an allowance of up to £300m of customers' money for the company to invest to improve the performance of the London water network. We consider this to be an appropriate allowance, over and above its existing capital maintenance mains replacement programme, for a programme of works in the period 2020-25 to deliver better service for customers. We make this allowance recognising that Thames Water is a clear outlier in performance of its water network. We are therefore stepping in to provide an allowance to first produce a plan and then start to improve service in the 2020-25 period, protect customer's interests, promote long-term asset health, learning and innovation in the company and supply chain.

Thames Water will face greater scrutiny on these allowances than would normally be the case. We will return the allowance to customers unless Thames Water

demonstrates that it understands the challenges facing its network and treatment resilience, produces a well thought-through plan in a defined time frame with clear and measurable deliverables and identifies, and commits to new performance standards that capture likely benefits to performance from any planned work.

Specifically in relation to the £300 million allowance to improve network performance, in addition to the conditions above, a further condition is that Thames Water's plan must also include a commitment from Thames Water's shareholders to make a substantial contribution to the cost of the improvement works.

We will confirm the appropriate allowance based on the agreed value of the programme, progression through the gates to our satisfaction and the value of the work completed to our satisfaction. In particular, where the conditions of the first gate are not met we will return the full £300 million allowance for performance of the London water network to customers. We will return the full allowance, or part of the allowance, to customers through an end of period reconciliation.

Setting the programme of work and an initial view of outcomes and outputs is a key deliverable from the initial gates. Our allowance requires Thames Water to:

- deliver quickly a planned programme of work through a gated-process with defined outputs and outcome;
- define customer protection mechanisms to ensure efficient costs. This includes incentives to ensure high quality and timely delivery of the required works with an end-of-period reconciliation;
- provide third party assurances; and
- clearly report performance, delineating its reporting between areas within this programme of work and the remainder of the network.

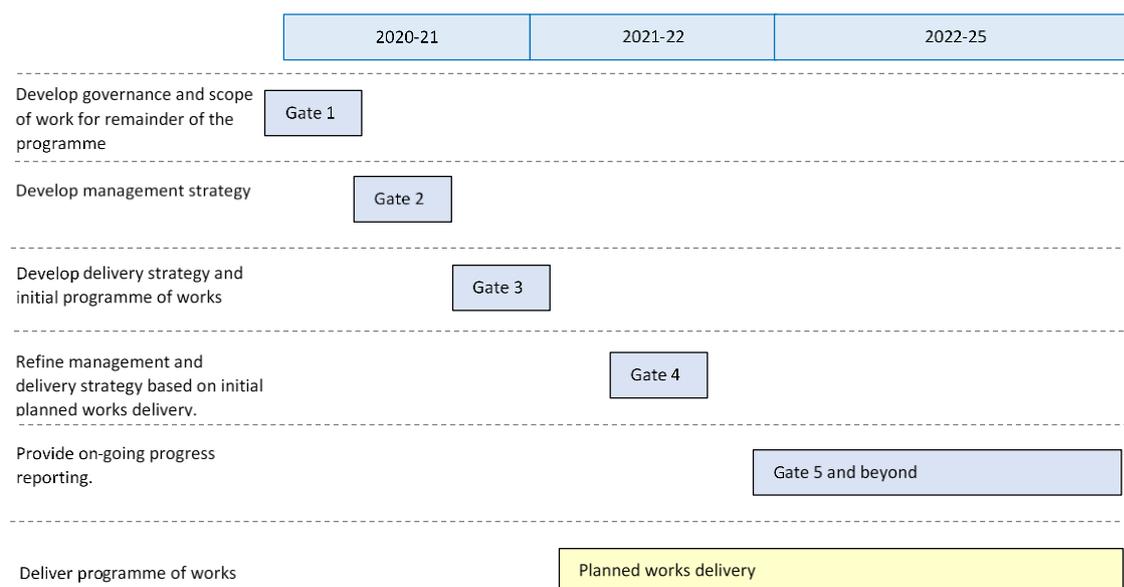
### **2.5.1 Process gates: planned programme of works and expected outcomes**

Our process will ensure that there is substantial co-funding from shareholders and that Thames Water will formulate a management strategy and delivery programme for the efficient, sustainable and continual improvement in performance of the London water network. We will monitor Thames Water's creation and efficient delivery of these plans through a gated-process. We recognise that Thames Water is delivering an organisational improvement plan. We consider that this allowance supports this initiative to build organisational capacity in making an enduring change in the performance of the water network.

The initial gate in the process requires Thames Water to produce a terms of reference to our satisfaction. If it does not we will return the full allowance of £300m to customers at the end of the period. Thames Water must set out in the terms of references the overall fund to be ring fenced for this activity, the feasible range of performance outcomes and outputs over a realistic timetable and a set of governance principles it will use for the remainder of the process. We will agree a set of outputs to act as leading indicators for the delivery of the outcomes in the longer term. However, we recognise Thames Water will produce its predictions based on assumptions and uncertainties that will reduce as the project progress. Thus we expect to revisit outcomes Thames Water will deliver through the process.

Table 2.1 summarises the activities we expect to Thames Water to complete to pass through this initial gate, our current expectations for how Thames Water should formulate its management strategy, delivery programme and on-going progress monitoring gates. However, we expect Thames Water to reiterate or refine the scope of works in this area and be accountable for its delivery.

We also expect Thames Water to engage with us beyond these formal gates, including through progress meetings and draft submissions, to enable the smooth and timely running of the process. We set out in Figure 2.1 our current expectations of the timing of this process. We expect the delivery of improvement works in the field covered by this allowance to begin after gate 3. Notwithstanding, the content of the initial gates should be informed by intelligence gained through on-going water network maintenance activities. The on-going monitoring of this activity and how it feeds back into the refinement of the asset management and delivery plans is covered by gates four and five.

**Figure 2.1 Summary of the gated-process.**

We expect Thames Water to set out in its management strategy its strategic plan for how the London water network will be managed to deliver the performance outcomes and outputs. We expect its strategy to be based on analysis that targets investment in the areas of greatest benefit to cost ratio and considers a range of interventions. It should aim to address not only infrastructure asset renewals but also any enabling activity that, for example, drives productivity improvements and delivers technological innovation.

We expect that the company's delivery strategy and programme should include, but may not be limited to, a series of work streams each with a plan of activities in specific locations with quantified deliverables (outputs and outcomes) and milestone dates. The programme should have a resourcing and contractor management plan and profiles for costs, management metrics and performance outcomes. It should also have a stakeholder management plan and a clear approach to liaison with local government and other agencies. Thames Water must set out and maintain clear governance including audit process and regular reporting to stakeholders.

We consider that it is appropriate for Thames Water to develop its asset management strategy and deliver activities in the field in parallel. To do this we expect a robust systems approach to monitoring delivery that feeds back results in a continual development cycle. Thames Water should make it clear through the on-going process of reporting, which areas of the water network it includes in this ring-fenced process and which are subject to reporting under the PR19 outcomes framework. We expect the company to propose revisions to its PR19 performance commitments which we will assess and agree at the second gate.

We expect the board of Thames Water to endorse the plan.

## **2.5.2 Customer protection, assurance and performance reporting.**

We will return the full £300 million allowance to customers if Thames Water fails to deliver or agree the terms of reference to our satisfaction, an essential requirement of this gate being the commitment of substantial co-funding from shareholders to our satisfaction. Thames Water is required to propose an outcome delivery incentive at gate one to incentivise the timely and efficient completion of the work through the following gates. This will apply an underperformance payment on the value of work to be delivered at each gate for unsatisfactory and/or late delivery. We will review and assess in-period the deliverables for each gate. We will confirm the appropriate allowance based on the agreed value of the programme, progression through the gates to our satisfaction and the value of the work completed to our satisfaction. In particular, where the conditions of the first gate are not met we will return the full £300 million allowance for performance of the London water network to customers. The final end of period reconciliation mechanism decision will reflect these earlier decisions but will ultimately be taken as part of PR24.

The scale of the underperformance payment needs to reflect the severity of the issue. This is consistent with our gated process for the strategic regional water resource solutions. We do not consider that Thames Water requires additional funding to deliver the outputs of the first gate and thus we will not apply any underperformance payment here. However, should the company not meet the requirements of this gate to our satisfaction, by the time we set, then the process will stop and we will recover the full allowance for customers at the end of the period. We expect the company to evidence that its costs are efficient throughout the gated process. This covers the costs of professional services and capital delivery and may include market testing, cost benchmarking and evidence of internal challenges.

The company should make use of a third party to assure its submissions. We require the assurers to have a duty of care to Ofwat but Thames Water is responsible for their appointment and fees subject to the on-going approval by Ofwat. We require full transparency of instructions and reporting that aligns with our interest. Should the assurers identify any areas of concern that Thames Water does not address then the assurers should report on their opinion of the materiality of any expected impact on the outcome of the programme. If we concur with the assurers that the concern is highly detrimental to the outcomes of the project we will consider further interventions.

Where potential benefits that flow from this allowance impact on performance commitments set in this final determination, potentially making the performance commitment levels or outcome delivery incentive outperformance payments easier to achieve, we will consider resetting those levels or incentives. This is to reflect the level of stretch and outperformance payment in line with our intention in our final determination. We will consider this and reset as necessary as part of the gated process.

In table 2.1 below we set out our current indicative view of what our expectations may be for the gated process. Thames Water must meet the expectations set for each gate. As mentioned previously, we expect Thames Water to reiterate or refine the scope of works in this area and thus own its delivery beyond the first gate.

**Table 2.1. Scope of work and timeline associated with the project gates.**

Gate	Scope of work required to pass the gate	Approx. Date for delivery
1	<p><u>Terms of Reference:</u></p> <ul style="list-style-type: none"> <li>• Agree the expected performance outcomes/output and the expected cost. This initial estimate of costs and performance will be refined through the further gates.</li> <li>• Set out an initial view of the likely activities to deliver the improved performance of the London water network.</li> <li>• Set out overall funding for improvement programme, including an agreed, substantial contribution from shareholders to co-fund the scheme.</li> <li>• Set out the organisational plan for this activity including job roles, responsibilities and reporting lines. This should be set within the context of other company transformation plans.</li> <li>• Set deliverables for future gates, confirm dates for gate delivery &amp; success criteria for passing these gates</li> <li>• Set timing and profile of investment associated with future gates, subject to review at future gates.</li> <li>• Set out the value of work to be completed at each gate that will be subject to the customer protection / financial incentives mechanism. Set the customer protection / financial incentives mechanism for gates 2 to 4.</li> <li>• Agree the approach to project assurance and monitoring and reporting against proposed performance outcomes/ outputs</li> </ul>	30 Apr 2020
2	<p><u>Management strategy and plan:</u></p> <p>The management strategy should include but may not be limited to:</p> <ul style="list-style-type: none"> <li>• An asset management policy setting out the framework for the development of the asset management strategy and its objectives.</li> <li>• An asset management strategy that sets out how the assets will be managed to achieve the objectives including, for example the expected levels of performance in specific areas, how these</li> </ul>	2020-21

	<p>will be achieved, how the optimum asset interventions will be determined and key accountabilities.</p> <ul style="list-style-type: none"> <li>• A plan of interventions for delivery and expected costs, risks and performance outcomes.</li> <li>• A system of continual development of the asset management strategy.</li> <li>• An approach to assessing the impact of the proposed work on existing PR19 performance commitments and how the company will address any overlap between the cost allowance and outperformance or underperformance payments.</li> </ul>	
3	<p><u>Delivery strategy and plan:</u></p> <ul style="list-style-type: none"> <li>• Set out the strategy for the efficient delivery of the plan of interventions. This should include a consideration of the potential for direct procurement for customers.</li> <li>• Set out the delivery plan for the plan of interventions. This should include but may not be limited to: <ul style="list-style-type: none"> <li>• Produce a breakdown structure of activities in specific locations with deliverables and milestone dates.</li> <li>• Programme organisational plan with roles and responsibilities for key positions.</li> <li>• Risk management process</li> <li>• Resourcing &amp; contractor management plan.</li> <li>• Management information to track progress against including profiles for costs, performance outcomes and other management metrics.</li> <li>• Stakeholder management plan and a clear approach to liaison with local authorities.</li> <li>• Governance process including audit and reporting to appropriate level in the organisation.</li> </ul> </li> </ul>	2020-21
4	<p><u>Management and delivery strategy review:</u></p> <ul style="list-style-type: none"> <li>• Review the management and delivery strategies and plans in light of lessons learnt from the initial programmes of field activity.</li> <li>• Provide amended management and delivery strategies if required.</li> <li>• Provide a revised programme of work for on-going monitoring, if required</li> <li>• Finalise the content and frequency of remainder of the gates until 2025.</li> <li>• Finalise the deliverables for future gates, success criteria for passing the gates and on-going project assurance.</li> <li>• Finalise profile of investment associated with future gates and the associated customer protection / financial incentives.</li> </ul>	2021-22
5 to many	<p><u>Ongoing performance monitoring:</u></p> <ul style="list-style-type: none"> <li>• Provide periodic reporting as agreed at previous gate. Reporting should include but not be limited to expenditure, outputs and outcomes delivered against targets. Current position with respect to the proposed customer protection measures.</li> <li>• Evidence continual development processes regarding asset management practices including organisational capacity</li> </ul>	Until March 2025

	<p>building, refinement of decision-making processes and asset information management, for example.</p> <ul style="list-style-type: none"><li>• Evidence continual development processes to ensure costs are efficient.</li></ul>	
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## 3 Thames Water – Smart metering cost adjustment claim

### 3.1 Background

Thames Water faces considerable supply-demand balance challenges principally driven by population growth and climate change. The company proposes investment to enhance its resilience to drought events within its water resources management plan and identifies the installation of smart metering as an important activity for demand management. The company considers that smart meter installation will bring significant benefits, both through reduction in household consumption and through improved identification and reduction of leakage.

At initial assessment of plans, we assessed the company's cost adjustment claim<sup>1</sup> and metering enhancement request separately. We determined a metering enhancement allowance based upon the output of our unit cost model. This model provides a cost allowance for new meter installations at properties which do not have an existing meter (regardless of basic or smart technology), the base model separately provides an allowance for the replacement of existing meters. We subsequently made a further adjustment to the allowance based on an uplift to the unit rate and an allowance for the company to replace existing basic meters with smart meters. At this stage of the process the information the company provided was limited and therefore it was necessary to make a number of assumptions to determine an allowance. These assumptions were subsequently revised based on the information the company provided at subsequent stages.

For draft and final determination we assess the company's uplift claim within our metering deep dive analysis. This analysis includes the company's total metering request and is undertaken within the Wholesale Water Enhancement feeder model: Metering. Table 3.1 below summarises the total expenditure the company requests for metering enhancement and the metering expenditure included within the cost adjustment claim at each stage of the business planning process. In the subsequent sections we discuss the company's metering enhancement expenditure request in full, including components both in and outside of the claim.

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<sup>1</sup> Note the claim is called 'Incremental cost of water stress on balancing supply / demand'

**Table 3.1: Summary of metering enhancement expenditure request (£million, 2017-18 prices)**

<b>Submission</b>	<b>Total requested</b>	<b>Cost adjustment claim request</b>
September 2018	413.2	257.0
April 2019	326.8	165.0
August 2019	326.8	165.0

### 3.2 Our draft determination

In its April 2019 revised business plan, the company submitted a reduced request, compared to its September 2018 plan, for metering expenditure and further supporting evidence describing the breakdown of costs. We assessed the company's total metering request within the Wholesale Water Enhancement feeder model: Metering. Following our query the company provided further detail of the components of its unit costs for meter installation/replacement, however, the company was unable to provide explanation to reconcile the variance between our modelled unit costs and its own costs that were significantly higher. While we accepted that the company provided some evidence of company specific factors that increased its costs of delivering its smart meter programme, primarily driven by the higher proportion of properties requiring internal installations within its London water resource zone, we did not find sufficient justification to support the full unit cost requested. We applied the company specific efficiency factor to other components of the metering expenditure request, where we did not have data available to compare directly with other companies, because Thames Water provided insufficient evidence to demonstrate the costs were efficient. We disallowed the enhancement expenditure associated with leakage repairs that was included within this request because based on our benchmarking with forward-looking performance we considered this investment to be covered by our base allowance. The company requested £326.8 million at draft determination and we made an allowance of £178.1 million.

### 3.3 Stakeholder representations

Thames Water states in its representation that we should evaluate its metering proposals through a deep dive approach rather than using a unit cost model and comparison with other companies. The company considers that metering

programmes can differ significantly between companies as a result of factors such as differing objectives, operating area characteristics and how each company allocates costs. It considers that the unit cost model is too simplistic and tests alternative model specifications, including separating optant and selective metering costs, including a density variable and including a variable relating to meter technology. The company does not find its alternative modelling approaches to be robust enough to be used across the industry but considers an increase in its allowance resulting from these alternative model specifications supports the company's higher unit costs which are influenced by these variables.

The company provides further information in response to our deep dive assessment and the cost challenges we applied at draft determination to support the higher allowances that it continues to request. The additional information focuses upon the breakdown of the company specific meter installation and replacement costs for smart meters it proposes to install within its progressive metering programme and as optant meters. This includes identification and explanation for factors that the company considers are specific to operating within London. We note that the company provides no further supporting information for the following components of its metering enhancement request: installation of small and large bulk meters, the Thames Valley fixed network and the Smart Metering Operations Centre.

### **3.4 Our assessment and reasons**

In response to Thames Water's representation, we reassess the potential for applying a higher unit rate for meter installation and a greater uplift for replacing existing basic meters with smart meters through a deep dive. We consider the individual components of the unit cost that the company provides, and assess the areas highlighted as significant cost drivers in the company's alternative modelling approach. When assessing if an uplift is valid for a component we consider the form of the model we use to derive an allowance and if it already captures the impact of operating in a dense urban environment. We do not consider that comparison with other companies is inappropriate because many of the activity components are directly comparable with other companies.

#### **3.4.1 New smart meter installations**

Our assessment approach for the installation of new smart meters is to provide Thames Water with an allowance based on the output from our metering unit cost model and make uplifts to this unit cost where the company provides sufficient evidence that justify its costs being higher than other companies. Based on our

assessment of the evidence that the company provides we consider that the uplift only applies to smart meter installations in the London area. We consider it appropriate to make uplifts based on these components to the metering model that reflect regional variations relating to operating within the London water resource zone because unlike the base model it does not include any explanatory variables related to density that will capture the impact of operating in a dense urban environment. When making any uplifts we consider if there is already an implicit allowance for the element in the unit cost model as a result of it being a common activity/challenge for all companies. To determine the implicit allowance for an element, we initially remove the London specific elements from the company's unit cost total and then calculate the proportion of total unit cost each element represents. We then calculate the implied implicit allowance from the unit cost model output assuming the same proportion for the element being considered. The uplifts that we make for Thames Water are driven by London specific operating factors and a recognition that there is a higher proportion of properties requiring internal installations in London. Table 3.2 below details our assessment of the elements of the company specific unit cost for new smart meter installation and indicates whether we consider an uplift to the modelled unit rate is appropriate based on the evidence the company submits.

**Table 3.2: Summary of our assessment of the elements contributing to the Thames Water new smart metering installation unit costs**

<b>Company defined cost category</b>	<b>Element of company unit cost</b>	<b>Our assessment comments</b>
Direct costs	Do job costs	No uplift, we consider this is included in the new meter modelled allowance for all companies
Direct costs	Meter (automatic meter read technology)	No uplift, we consider this is included in the new meter modelled allowance for all companies
Direct costs	LCE (signal boosting device to upgrade to advanced meter infrastructure technology)	No uplift, we consider this is included in the new meter modelled allowance for all companies
Direct costs	Ultra low emission zone (ULEZ) / Congestion charges	We allow an uplift in full as we consider this to be a London specific factor

<b>Company defined cost category</b>	<b>Element of company unit cost</b>	<b>Our assessment comments</b>
Direct costs	Dartford crossing	We allow an uplift in full as we consider this to be a London specific factor
Direct costs	Parking	We consider this to be influenced by London specific factors. Therefore, we allow but remove an implicit allowance because we consider other companies will also face parking costs
Direct costs	Comms. cost	We consider this to be influenced by London specific factors. Therefore, we allow but remove an implicit allowance because we consider other companies will face issues in accessing properties for internal installation
Direct costs	Overheads	No uplift, we consider this is included in the new meter modelled allowance for all companies
No install costs	Customer not in	We consider this to be influenced by London specific factors. Therefore, we allow but remove an implicit allowance because we consider other companies will face issues in accessing properties for internal installation
No install costs	Unmeterable property	We consider this to be influenced by London specific factors. Therefore, we allow but remove an implicit allowance because we consider other companies will have to deal with unmeterable properties
Support costs	Staff	We consider this to be influenced by London specific factors. Therefore, we allow but remove an implicit allowance because we consider other companies will incur costs relating to these support components
Support costs	Equipment (IT etc...)	
Support costs	Office and Depot	
Support costs	Overheads	

As a result of our assessment we make an allowance based on a unit rate of £334 per meter for new smart meter installation in London. The company receives the modelled unit rate of £220 per meter for installations outside of London consistent with the approach applied to other companies.

### 3.4.2 Replacement of existing basic meters with smart meters

Our assessment approach for the replacement of basic meters with smart meters is consistent with the approach we take for other companies and the analysis for new smart meter installations. We make no additional allowance for basic meter replacement costs identified by the company because the implicit allowance within the base model should be sufficient for this activity. We do however, consider the company's specific regional factors and costs associated with an upgrade in technology from basic to smart metering. However, in considering specific factors we additionally note that unlike the metering enhancement model, the base model includes density and density squared explanatory variables to reflect the costs of operating within a dense urban environment. Therefore, we consider that some of the adjustments we make for specific regional factors for new meter installations are not required for meter replacements. Table 3.3 below details our assessment of the elements of the company specific unit cost for replacement of basic meters with smart meter and indicates whether we consider an uplift to the modelled unit rate is appropriate based on the evidence the company submits.

**Table 3.3: Summary of our assessment of the elements contributing to the Thames Water cost for replacement of basic meters with smart meters**

Company defined cost category	Element of company unit cost	Our assessment comments
Direct costs	Field Investigation (Cost to investigate meters unable to be read Smart - Truck Roll Costs)	We allow an uplift, with an adjustment assuming external digs are included in the base allowance <sup>2</sup>

<sup>2</sup> The company includes a small proportion of external digs within its cost breakdown representing a scenario where external meter exchanges will require a replacement boundary box necessitating excavation due to damage, the box being life expired or the box being inappropriate for the new meter. However, we consider that this cost will be included in the implicit allowance from the base model because all companies will face this potential issue when replacing meters. Therefore we make an allowance for these meters based on the external (screw in) component costs the company presents.

Direct costs	Do job costs	No uplift, we consider this is included in implicit allowance for meter replacement from the base model
Direct costs	Meter (automatic meter read technology)	We allow a partial uplift consistent with assessment of other companies. We consider the cost of the basic meter is included in implicit allowance from the base model and therefore we allow an uplift to install an automatic meter read (AMR) meter in this component and the upgrade to advanced metering infrastructure (AMI) functionality in the LCE component.
Direct costs	LCE (signal boosting device to upgrade to advanced meter infrastructure technology)	
Direct costs	Ultra low emission zone (ULEZ) / Congestion charges	We make no allowance because the base model includes density and density squared explanatory variables to reflect the costs of operating within a dense urban environment.
Direct costs	Dartford crossing	We make no allowance because the base model includes density and density squared explanatory variables to reflect the costs of operating within a dense urban environment.
Direct costs	Parking	We make no allowance because the base model includes density and density squared explanatory variables to reflect the costs of operating within a dense urban environment.
Direct costs	Comms. cost	We consider this to be influenced by London specific factors and therefore allow uplift with an implicit allowance removed because other companies will face issues in communications. We assume the implicit allowance applied is proportional to that identified for new installations.
Direct costs	Overheads	No uplift, we consider this is included in the base model allowance
No install costs	Customer not in	We consider this to be influenced by London specific factors and therefore allow an uplift with an implicit allowance removed because we consider other companies will face issues in accessing properties for internal installation
Support costs	Staff	We consider this to be influenced by London specific factors and therefore allow with an implicit allowance because other companies will incur costs relating to these support components. We assume the implicit allowance applied is proportional to that identified for new installations.
Support costs	Equipment (IT etc...)	

Support costs	Office and Depot	
Support costs	Overheads	

As a result of our assessment we make an allowance based on an uplift of £57 per meter for new smart meter installation in London. The company does not request any enhancement expenditure for the replacement of basic meters with smart meters outside of London.

Although we provide additional allowance for installations and replacements within London in the 2020-25 period we would expect the company to become more efficient and adopt innovative solutions as it delivers this programme which will remove or reduce the need for a 'London' uplift in future programmes.

### 3.5 Our final decision

We make an allowance of £203.3 million for Thames Water to deliver its smart metering programme at final determination, an increase of £25.1 million from draft determination. We revise the performance commitments that we intervened on at draft determination, in order to ensure customers are protected and funding returned for under or non-delivery.

In Table 3.4 below we provide a summary of the company's request and our allowance by component.

**Table 3.4: Summary of our assessment of the components of Thames Water's smart metering programme (£million, 2017-18 prices)**

Component description	Assessment method	Company request	Final determination allowance	Comments
Smart household metering	Unit cost model with cost adjustment claim considered	183.443	132.190	We amend the allowance made at draft determination, making an allowance based on the unit cost model output, adjusted for the uplift components we consider valid (see Table 3.2).
Optant metering	Unit cost model with cost adjustment claim considered	39.975	20.422	
Small bulk meters	Proportional unit cost challenge based upon the challenge identified for lines 1 and 2	22.297	16.063	The company does not provide a detailed breakdown in its representation for these costs as it does for lines 1 and 2. However, we consider that there is enough similarity, due to likely meter installation locations and size of meter to make application of an efficiency challenge proportional to that associated with new installations in line 1 appropriate.
Large bulk meters	Deep dive	14.318	13.426	The company provides insufficient evidence to justify the costs it presents as efficient and, therefore, the company level efficiency challenge is applied. The allowance is amended from draft determination because it is based upon an updated company specific efficiency factor.
Smart replacements	Unit cost uplift with cost adjustment claim considered	30.810	7.389	We amend the allowance made at draft determination based on further evidence the company provides, identifying the uplift components we consider valid (see Table 3.2). Note that we consider the basic meter component of this line, £18.1 million to be included within the base model allowance. Therefore the enhancement allowance we make corresponds to a request for £12.7 million.

Customer supply pipe leak repairs	Deep dive	21.122	0.000	Unchanged from draft determination. For costs associated with reducing leakage, we benchmark forward-looking performance and consider this investment is covered by our base allowance. Further detail is provided in the supply demand balance feeder model
Thames Valley fixed network	Deep dive	11.100	10.409	The company provides insufficient evidence to justify the costs it presents as efficient and, therefore, the company level efficiency challenge is applied The allowance is amended from draft determination because it is based upon an updated company specific efficiency factor.

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

Ofwat  
Centre City Tower  
7 Hill Street  
Birmingham B5 4UA

Phone: 0121 644 7500  
Fax: 0121 644 7533  
Website: [www.ofwat.gov.uk](http://www.ofwat.gov.uk)  
Email: [mailbox@ofwat.gov.uk](mailto:mailbox@ofwat.gov.uk)

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