love every drop
anglianwater

Our PR24 Enhancement Strategies

PR24 Draft Determination Representations – August 2024

Part 4: Enabling sustainable economic and housing growth

PR24 Enhancement Strategies Part 4: Enabling sustainable growth

Enabling sustainable economic and housing growth

1 Overview

This document sets out our Representations on the enhancement investments that we propose to make to help us achieve the ambitions set out in our Strategic Direction Statement. This specific section sets out investment to enable sustainable economic and housing growth. It follows on from our 'Sustainable Growth' (ANH29) enhancement strategies published alongside our original PR24 business plan. For each enhancement strategy we set out:

- **Investment summary** - In this section, we summarise our requested totex for each enhancement strategy and highlight where these costs are reported in our updated data tables. We set out how our requested totex compares with our original plan (as at March 2024) and Ofwat's Draft Determination allowance.
- **Context** - In this section, we summarise the investments that were included in our enhancement strategy in our business plan submission, and how this was assessed by Ofwat in its Draft Determination.
- **Our representations** - This section contains our Representations on Ofwat's Draft Determination. Here, we set out whether our Representations align with Ofwat's Draft Determination; or whether we are providing further evidence or presenting new information such as updated cost data, evidence of need or wider drivers such as new obligations.

Figure 1 Representations investment summary

2 Metering

2.1 Investment summary

	March 24 Business Plan (£m)	DD Ofwat position (£m)	Representation (£m)
Capex	118.8		111.8
Opex	27.6		27.4
Totex	146.4	100.7	139.2

In our updated data tables, these costs are reported against lines CW3.90 (Total metering expenditure) and associated CW12 and CW17 lines.

2.2 Context

Our PR24 demand management strategy is predicated upon the completion of our smart meter roll out to all customers by 2030. Smart meters and the wealth of data they generate allow our customers to better understand their usage and become more water efficient, whilst also allowing us to identify leaks, helping the customer to fix them in a timely manner. These benefits allow us to save water through behavioural change along with plumbing loss and customer supply pipe leakage reduction

Separately, we also included investment for Licensed Abstraction Reporting System (LARS) meters.

2.2.1 Ofwat's DD assessment

Ofwat assessed the requested expenditure for new meter installation and new meter upgrades separately.

New meter installations: Ofwat used a logarithmic model to estimate efficient expenditure as a function of the new installations. Through this approach, we were given a DD modelled allowance of £18.0m, in comparison to the requested totex post reallocations of £22.0m.

Meter upgrades: Ofwat used information provided in our query response OFW-OBQ-ANH-055 to separate out some of our costs, which it views to be base costs rather than enhancement. In our case, Ofwat assessed that the enhancement cost per meter in our plan was £40.83, and subsequently allocated £28.1m of our requested totex to base expenditure.

Ofwat used a logarithmic model to estimate efficient expenditure as a function of the number of meter upgrades. Ofwat also includes our costs for smart meter infrastructure in this model.

In comparison to the requested totex of £122.4m (post reallocations), Ofwat's model set the permitted allowance at £82.6m for meter upgrades.

2.3 Our representations

2.3.1 Basic meter replaced with smart meters

Base allocation

As part of its assessment of our smart metering costs, Ofwat excludes £28.1m of our costs from its enhancement cost assessment on the basis it believes these costs relate to base activities. Ofwat draw this conclusion by reference to information we provided in response to query OFW-OBQ-ANH-055. Ofwat requested companies provide more granular breakdowns of our meter upgrade enhancement costs.

In response to our query OFW-IBQ-ANH-008, Ofwat confirmed it had allocated the spend from certain lines of this query response to base expenditure and subsequently excluded them from its enhancement cost analysis. This split is shown in the table below. For Anglian, all of the costs presented on the 'Job costs' and 'Programme management' cost lines were assumed to be base activities.

Table 1 Metering cost breakdown

Cost category (Meter Upgrades)	Internal	External requiring digs	External no dig
Number of installations (nr)	166,285	18,289	889,463
Meter device purchase cost (£)	£4.032m	£0.444m	£39.136m
Boundary box purchase cost (£)		£0.243m	
Number of boundary box installations (nr)			
Number of boundary box replacements (nr)		18,289	
Other associated hardware (£)			

Cost category (Meter Upgrades)	Internal	External requiring digs	External no dig
Job costs (incl labour and assumption for abortive visit costs)	£4.669m	£3.260m	£4.705m
Transport and vehicle costs			
Parking costs			
Congestion charges/ULEZ costs			
Programme management costs	£3.896	£0.519m	£3.563m
Smart meter operational centres			
Meter data management systems			
Communication equipment			
Smart infrastructure - fixed network/masts			
Smart infrastructure - other			
Customer side leakage			
Water efficiency			
Total enhancement unit cost	£75.76/meter	£244.16/meter	£53.29/meter

We have significant concerns with how Ofwat has excluded enhancement costs using this information. We set out many of these concerns in our response to query OFW-OBQ-ANH-055.

Principally, we highlighted that as Ofwat was requesting a new level of granularity of cost breakdown, there was no standardised definitions for each component of cost requested. It is therefore almost certain there will be inconsistencies between companies' submissions.

Additionally, unlike the data provided in companies' Business Plan tables this more granular cost data will not have been through assurance processes. On this basis, we cannot see how Ofwat can have sufficient evidence that these costs represented base costs and should therefore be excluded.

As highlighted in the Enhancement chapter of our DD representation, we have reviewed all of the areas of where Ofwat has removed costs from its enhancement assessment on the basis that it considers these to be base costs. In several areas, we have accepted Ofwat's cost challenge and removed costs from our enhancement request accordingly. Having reviewed Ofwat's approach on metering, we do not consider it is appropriate to remove these costs from enhancement. There are three key reasons for this, which are discussed in the three paragraphs below.

Programme costs - Ofwat has rejected the enhancement costs that we allocated to the 'programme costs' line in our OFW-OBQ-ANH-055 response. We set out in both our metering enhancement case, and in our response to that query that we had excluded all base costs from our enhancement requests, and only included the costs required as part of the uplift from basic to smart meters.

Whilst these back-office costs were reported against the 'programme management' line, these costs have not been reflected in companies' historical expenditure as there were no definitions or guidance on the activities that should have been included on each line. Therefore, these costs could also have been reported against the 'smart meter operation centres, and 'meter data management systems' lines, in which case these would have been accepted as enhancement costs. We are clear that the nature of these costs is such that base costs have not been included, and only back-office costs required for the smart meter uplift have been included in our enhancement costs. We have therefore retained these costs in our plan.

Job costs - Ofwat has rejected the enhancement costs allocated to the 'job costs' line of our query response. As with programme management costs, we have only included the incremental costs of installing a smart meter over installing a base meter in these costs. The treatment of job/installation costs was considered as part of the PR19 CMA redetermination. On this, the CMA stated: *"During our redetermination, Anglian has provided additional information on these cost figures which has allowed us to reconcile its proposal to the full amount of its claim. In particular, the differences between the figures appear to represent incremental installation costs beyond the meters themselves...We therefore consider that Anglian should be provided with its full requested allowance for these incremental smart meter costs" (PR19 CMA redetermination, page 536).* The 'job costs' that we set out in response to Ofwat's query represent the equivalent costs to those which were allowed by the CMA at PR19. Therefore, we consider that these costs are correctly allocated to enhancement and should not be considered base costs.

On this basis, Ofwat sought to remove £20.6m associated with programme and job costs. However, in total £28.1m has been removed from our enhancement costs. On review of our query response, this appears to be due to the costs of our AID

meters, to be delivered in AMP7, also being excluded from these costs. Not including these costs as enhancement, automatically allocates these costs incorrectly to base. This should be corrected ahead of the Final Determination.

We consider that the three points above (programme management, job costs and AID costs) address the misallocation of smart metering costs to base in full.

The breakdown of costs across each of the sub-categories set out in Ofwat's query have not been shared for all companies so we are unable to comment on the allocation of other companies costs between enhancement and base. However, the fundamental concerns we have of this approach (notably, that Ofwat does not have sufficient reliable information from that query response to reallocate companies' enhancement costs) applies to how Ofwat has assessed the smart metering costs for all companies. This assessment has broader consequences as it reduces the costs (which may be genuine enhancement) that are used in the meter upgrade cost model, and therefore suppresses the efficient cost allowances in this area. We request that Ofwat revise its approach to removing companies' enhancement cost such that it only does so if it has very clear cost intelligence showing that the costs are associated with base activities.

Efficiency

After the correction of the base/enhancement allowance split highlighted above, there remains a gap between the costs included in our plan and those allowed by Ofwat's cost model. Following our double-lock on efficiency, we have sought to align our costs with Ofwat's efficient view of costs, unless there is a reason not to. On reviewing Ofwat's cost model, we have concerns over how the model treats different companies' smart meter infrastructure costs. This is particularly important that an appropriate allowance is made for metering costs given the significant increase in demand on the smart meter supply chain to install over 10 million new smart meters across the industry in AMP8.

Companies are taking different approaches to the procurement of smart meters and smart meter infrastructure in AMP8. Some are opting to outsource the delivery to a third party on a data as a service (DaaS) basis, with all costs being reflected as enhancement opex, and no upfront capital costs to install the smart meter infrastructure. Others, including Anglian, have upfront capital costs to install the network with lower ongoing base costs. We opted for this solution because we believe it is the best one to deliver the level of data our customers require. In our region this means having to bear the capital cost of building the network rather than procuring a data as a service model. Smart meter infrastructure presents a long-term investment, and taking a five year totex view to assess cost efficiency, as the current Draft Determination model does, will serve to look more favourably on those companies that have taken an opex-based approach by default (as cost allowances are brought up by the companies that have taken a capex approach to installing the network). It will therefore not be a true reflection of the efficiency of companies efficient costs of installing smart meter infrastructure. We consider that companies taking different approaches should not be assessed as if they were like-for-like. We suggest that an approach to doing this would be to conduct separate cost modelling depending on the approach to delivering smart meter infrastructure that each company has chosen.

It is also important to note that there is a difference in the expected performance of smart meter solutions being proposed across companies 'plans. This is reflected to a degree in the smart metering price control deliverable, however it is not reflected in cost allowances. We consider that our costs may be higher than other companies with an otherwise equivalent network setup because our network will give customers more certainty that they will get the quality of data that will help them to understand and reduce their water usage. This underlying information has not been reported in companies' data tables, so we suggest that Ofwat collect additional data from companies on this point after DD representation submission.

Finally, we consider that the cost allowance for companies' smart meter data management should take into account the extent to which they have already rolled out smart metering before AMP8. These enhancement opex costs are brought into Ofwat's meter upgrade models and an allowance is given based on the number of smart meters installed in AMP8. However, for companies such as Anglian (we will have rolled our smart meters to half of our region before the start of AMP8), the data management costs are required for both the AMP8 installed meters and the ongoing enhancement opex of the smart meters installed in AMP8. We therefore suggest that the number of smart meters installed before AMP8 is reflected in Ofwat's assessment of smart meter data management costs.

Reallocation of leakage costs to smart metering

Ofwat has reallocated £1.78m of our leakage costs to smart metering. These costs are associated with investigations which are conducted after a smart meter has suggested there may be leakage at a property. This a separate and very different activity to the installation of smart meters and smart meter infrastructure which is assessed in Ofwat's metering cost model. Adding these costs to smart metering serves to increase our costs for the delivery of the same cost driver (i.e. number of meter upgrades/ installations), thereby making our costs appear artificially less efficient. The investigation's activity is conducted primarily to reduce leaks, not to install meters, and therefore these costs should be removed from the smart metering model and considered within the leakage enhancement cost assessment instead.

Clarifying definition for meter upgrade

We request Ofwat assess the efficient industry unit cost of meter replacement and meter upgrades separately to account for the differences between these two solutions and associated costs. We retain our efficient view of totex for our meter replacement and smart meter network costs.

2.3.2 New meter installations

Ofwat has used a single cost driver (number of meter installations) to calculate its allowance for new meter installations. Whilst intuitively this is the primary cost driver, only using the number of number of new meter installs insufficiently takes into account that companies will deliver different types of installations which are outside of their control. This means that the different types of installations (rather than efficiency) could explain a significant proportion of the deviation of companies' costs from the new installation modelled costs.

Previously, Ofwat has not had data on the number of different types of installs (i.e. internal, external dig, and external no dig), but through the data it collected through query OFW-OBQ-ANH-055 it now has this data for all companies. Given that this data is available, we believe Ofwat's new meter installation allowances should use the cost and volume data that it has now collected.

We know from our own experience that the average cost of a new meter installation has increased over time as meter penetration increases. This is because cheaper installations (typically external no digs) can be prioritised at low meter penetration because these meters are the most cost beneficial. Once meter penetration reaches a high level, the remaining installations reflect the disproportionately higher cost installations (internal, and external dig) remaining as meter installs.

Within our region we will, by the end of AMP7, have a meter penetration of c.91% with c.85% paying via a meter. We have been promoting metering as our preferred method of charging since the mid 1990s. Outside of Hartlepool, we will also have attempted, at least once, to meter all properties under our Enhanced metering programme. As such, this has meant that the easier, cheaper meter installations have already been completed, requiring us to undertake more complex installations to reach our meter rollout target.

The data we provided to Ofwat in our OFW-OBQ-ANH-055 response set out that the costs of different installs varies significantly (ranging from £157.41 for an external no dig, to £639.58 for an external dig). This drives a significant variation in potential costs depending on the split between these meter types. To illustrate this point, the table below sets out how the costs of our actual PR24 new meter installations compare to what these costs would be if proportion of meter installations reflected our broader meter stock. This shows that if meter installs reflected our broader meter stock, our estimated enhancement requirement would be £9.4m, compared to our actual requirement of £19.7m. This cost difference is purely due to the type of meter installation taking place, yet in the DD model, under both of these scenarios we would have received the same allowance, with any difference explained as (in)efficiency.

Table 2 New meter installation costs

	Internal	External requiring digs	External no dig	Total
Enhancement unit cost (from OFW-OBQ-ANH-055) (£)	367.51	639.58	157.41	
Actual number/ proportion of new installs (from OFW-OBQ-ANH-055)	21,027/44.2%	16,286/34.3%	10,165/21.4%	47,478/100%
Total cost (unit cost x volume) (£m)	7.728	10.416	1.600	19.744
Number/ proportion of new installs if reflective of full meter stock (using meter upgrade proportions (from OFW-OBQ-ANH-055)	7,359/15.5%	807/1.7%	39,311/82.8%	47,478/100%
Total cost (unit cost x volume) (£m)	2.704	0.516	6.188	9.408

As the information companies provided on the volume and cost splits between the different types of installation has not been shared with companies, we cannot see what our allowance would be if type of installation were taken into account. Therefore we have retained the costs in our business plan for this investment. However, Ofwat does now have this information for the whole industry and we consider that this should be used to address the issue highlighted above.

Given the industry has provided granular data on the costs and number of meter installation by installation type, we believe Ofwat should utilise this information to set cost allowances on a meter installation type level rather than an aggregate level. As such, our Representations retain our view of efficient totex for meter installations set out in our Business Plan.

3 Leakage improvements

	March 24 Business Plan (£m)	DD Ofwat position (£m)	Representation (£m)
Capex	31.5		31.5
Opex	3.4		3.4
Totex	34.9	0.0	34.9

In our updated data tables, these costs are reported against lines CW3.47-CW3.49 (Leakage improvements delivering benefits in 2025-2030) and associated CW12 and CW17 lines.

3.1 Context

Reducing leakage is a particularly significant challenge for Anglian. As one of the driest areas of the country, with significant population increases and facing significant abstraction reductions to protect the environment, we have a particularly strong need to manage water demand in our region in line with our WRMP. We've long acknowledged this need and have acted upon it, consistently being the frontier performer on leakage when normalised for km of mains, and one of the top companies when normalised for property numbers. Being at the frontier of leakage reduction means we have already delivered the leakage reduction activities which are relatively low-hanging fruit. Reducing leakage further often involves identifying and fixing smaller and harder-to-detect leaks, which are more expensive to find and deliver less benefit compared to fixing larger leaks. This requires both innovation in finding new ways to reduce leaks, and investment through methods which have a higher cost on a £/Ml/d of leakage reduced basis.

Our business plan considered multiple options for reducing leaks further. The investments in our plan focussed on three main areas:

- *Shared supply smart meters*. (Installation of smart meters at shared supply pipes to support the identification of leakage on these pipes and inside customers properties. These smart meters are not part of our smart metering rollout (see Section 2 'Metering') as they do not support individual customers with their own consumption but do give us improved visibility of CSPL and plumbing losses.)
- *Mains renewal*. (Renewal of water mains within identified District Metered Areas as set out in our leakage mains renewal representations below. These mains will be identified by using step tests and other techniques to quantify potential levels of leakage on specific sections of main and within DMAs. This is separate to our CAC for mains renewal through base)
- *Smart Meter Investigation visit* (Investigation work to arrange for customers to fix leaks on their supply pipe, where a smart meter has identified a leak)

3.1.1 Ofwat's Draft Determination assessment

Ofwat conducted separate assessments for each of the leakage investments. For mains renewals investments, Ofwat set companies' allowance base on a unit cost of £292.428 per metre of main replaced. This was less than the mains renewal for our leakage programme of £561 per metre, and this resulted in allowance of £13m (£12m lower than our requested allowance for leakage mains replacement of £25m).

For shared supply pipe leakage, Ofwat assessed this investment as 'other leakage enhancement'. Ofwat made an allowance based on a unit rate of £1.11m/Ml/d, using the median rate of historical leakage reduction costs. This results in an allowance of £4.1m (£4m lower than our requested allowance of £8.1m).

For smart meter investigation visits, Ofwat reallocated costs to its smart meter cost model, and considered these costs as part of its assessment of smart meter infrastructure.

These assessments resulted in an initial allowance for leakage of £17.2m. Ofwat subsequently applied an 'AMP7 underperformance adjustment'. This was to remove any perceived double-count of funding at PR24 from that allowed at PR19. This resulted in the full £17.2m enhancement costs being disallowed, resulting in a final leakage enhancement allowance of £0.

3.2 Our Representations

3.2.1 Leakage performance adjustment

In the Draft Determination, our full enhancement allowance was disallowed on the basis that we are not meeting our AMP7 performance commitment level.

This assessment doesn't take into account that as part of our PR19 determination by the CMA, our AMP7 leakage ODI penalty rate includes a clawback for the enhancement allowance. This is set out in paragraph 8.177 of the CMA's final report, in which it stated:

"Two penalty rates apply to Anglian and Bristol. The Tier 1 penalties applied only to companies that had been awarded enhancement spending. If a company maintained its 2019/20 level of performance, but did no better, it would have to return its enhancement costs allowance to customers. This would act as a clawback mechanism for the enhancement totex they received."

Whilst an upfront leakage allowance was made to reduce leakage in line with the PCL, this clawback mechanism means that the final enhancement costs we recover from customers will only be to achieve the level of leakage that we deliver. Applying both this clawback mechanism and not allowing our PR24 enhancement double-counts the clawback of allowances to deliver the level of leakage we need to meet in AMP8. This error should be corrected in the Final Determination by removing the 'AMP7 underperformance adjustment' from our leakage enhancement cost assessment.

Whilst we have not met our performance commitment level in AMP8, we do not consider that this is because the enhancement investments proposed at PR19 have not been delivered. This is evident from the level of leakage reduction enhancement expenditure reported in our APR; £112.44m for AMP7 so far. Rather, we consider this is mostly attributed to the unpredictable challenges of reducing leakage when at the frontier of performance (particularly the uncertainty of the impact that enhancement investment will make) and the impacts of extreme weather events.

Ofwat also errs when looking at the leakage reduction in our business plan on a single year Ml/d basis and concluding we proposed no improvement, when in fact we proposed to go beyond the PR19 PCL which is expressed as a percentage reduction from the 2019-20 baseline in three-year average terms. In response to query OFW-IBQ-ANH-053 Ofwat states that it has looked at single year leakage values. This is inappropriate and not in line with the PR19 Final Determination or the definition of the performance commitment. We note that if we were performing better than the PCL in AMP7 but then proposed very high levels of leakage in a single year in 2024/25 (while still being in line with the % reduction) Ofwat would not have compared our 2024/25 single year performance with our proposed 2029/30 proposed performance to infer a level of stretch.

3.2.2 Mains renewal

Ofwat applied a flat unit rate for the leakage mains renewal enhancement allowance of £292 per metre of mains renewal in its DD assessment. We recognise that in some parts of its Draft Determination, Ofwat will set an allowance based on a simple unit rate. Across our enhancement plan, we have sought to accept Ofwat's Draft Determination allowances, unless there is a clear reason not to do so. In this investment area we consider there is important information relating to leakage mains replacement which has not yet been taken into account in the Draft Determination, principally relating to the diameter of mains being renewed and the impact this has on unit costs.

In order to achieve the level of leakage reduction required through mains renewal, previous experience and industry best practice has shown that geographical replacement rather than asset by asset replacement gains higher leakage benefit. Because of this, we have developed our PR24 leakage mains renewal programme on the basis of discrete high leakage geographical areas. The pipes in these areas consist of a range of diameters. We identified the 5 highest leakage areas for pipe replacement, including communication pipes. In the selected areas for leakage reduction we have a mix of large trunk main assets plus smaller diameters supplying properties. Large diameter pipes are inherently more expensive than standard mains renewal that tend to be individual lengths of a consistent diameter.

As part of our cost efficiency double-lock approach, we assessed the efficiency of our mains renewal costs through both the bottom up build up of our costs, and comparing our costs to relevant cost benchmarks where these are available. We have sought external benchmarking of these costs from the WRC TR61 data set which uses costs data for similar activities from 9 water companies. We benchmarked our combined unit rate (construction technique and surface type) to Open cut data surface type data available. The benchmarking found that we are 14% less expensive than the benchmark across the programme.

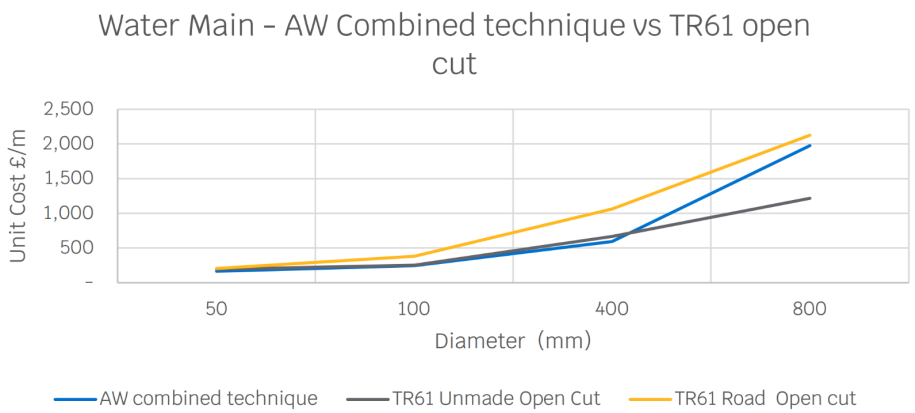
The following table shows the cost breakdown of the pipes assumed to be renewed within the areas where we are planning leakage mains replacements:

Table 3 Cost breakdown: Pipes

Mains groups	Diameter (mm)	Length (m)	Unit rate (£/m)	Surface type
Mains 1	51	657		53% unmade/47% road
Mains 2	107	25,066	246	47% unmade/53% road
Mains 3	405	15,780	595	89% unmade/11% road
Mains 4	863	2,659	1,979	87% unmade/13% road
2545 Comms pipes			1,229	per pipe

The chart below shows how our costs compare to the external benchmark for each pipe diameter.

Figure 2 Cost benchmarking - AW versus TR61



Given the range of unit costs across different diameter mains, we consider that the cost assessment approach undertaken in the Draft Determination risks reducing companies allowances based on the nature of their mains replacement programme, rather than efficiency. We recognise that the mains diameter data has not been collected across companies in a systematic way, but we consider that Ofwat could improve its mains renewal assessment by either a) collecting additional mains diameter data from companies ahead of FD, or if this is not possible b) taking into account the information we provide above and in response to query OFW-OBQ-ANH-127 as part of its assessment of Anglian's efficient unit cost for leakage mains replacement.

Overall we consider the costs we have built up and benchmarked to be a more realistic reflection of the efficiency of our leakage mains renewal enhancement costs, than the flat unit rate used in the Draft Determination, therefore we have retained our Business Plan costs for this investment.

3.2.3 Shared supply smart meters

Ofwat makes an allowance of £1.11m/Ml/d for shared supply leakage reduction as part of its allowance for 'other leakage enhancement'. We recognise that companies will propose a variety of approaches to reducing leakage and undertaking a bespoke assessment of the efficiency of each individual method may not be feasible.

However, we also consider that the approach of combining different leakage activities into a single unit rate assessment risks giving some companies disproportionately high, and others disproportionately low, allowance for the type of activity they are undertaking.

The approach of taking a flat unit rate across all companies, also doesn't sufficiently take into account that some companies have more low-cost options available to them to catchup on leakage performance, whereas others who are higher performers will have fewer options available. This point was explored at PR19 through the CMA. In particular, paragraphs 8.136-8.137 state:

"We do not consider it appropriate to apply a top-down approach in Anglian's case, largely due to the challenges in finding an appropriate unit rate. This is because:

(a) Anglian's rate is much higher than others, but this does not necessarily mean there are major inefficiencies. Comparing this with companies with higher levels of leakage and/or less challenging conditions is not always appropriate, for example if there are increasing marginal costs to leakage reduction."

and

"Point (a) also suggests using an upper quartile unit cost rate or Ofwat's suggested unit rate of £1.2 million per Ml/d for Yorkshire would not be appropriate."

The CMA therefore undertook its assessment on a bottom-up basis for our leakage investments. A detailed bottom-up assessment may not be appropriate for all companies. Indeed, the CMA focused its bottom-up assessment of leakage costs only for the top performing companies. We therefore consider that Ofwat should take forward targeted bottom-up assessments of companies' leakage enhancement costs. Or, if it cannot undertake detailed assessments, an appropriate approach could be to undertake targeted shallow-dive assessments of the top performing (e.g. upper quartile) leakage performers.

Across our enhancement plan, we have sought to accept Ofwat's Draft Determination allowances, unless there is a clear reason not to do so. In this case, we consider that Ofwat's flat unit rate for other leakage investments does not appropriately reflect the cost requirements to deliver leakage reduction through shared supply pipe metering. We have therefore retained the costs on our original business plan for this investment and request that Ofwat makes the adjustment to its assessment process for this investment, set out above.

4 Water efficiency (demand side improvements)

4.1 Investment summary

	March 24 Business Plan (£m)	DD Ofwat position (£m)	Representation (£m)
Capex	0.0		0.0
Opex	21.7		21.7
Totex	21.7	22.5	21.7

In our updated data tables, these costs are reported against lines CW3.44-CW3.46 (Demand-side improvements delivering benefits in 2025-2030 (excl leakage and metering)) and associated CW12 and CW17 lines.

4.2 Context

Our demand management (water efficiency) enhancement investment has been developed to fully align with our WRMP24 and represents our most extensive programme of water efficiency and behaviour change activity to date.

The selected option portfolio includes provision of smart water devices/sensors, continued development of the 'MyAccount' App to provide customers easy access to data, and additional community based campaigns, among other measures.

The details of the investment as presented in our business plan (ANH29) remain correct.

4.2.1 Ofwat's Draft Determination assessment

For Anglian, Ofwat assessed this investment solely through modelled benchmarking. The model calculated allowances across the transition period (2023-2025) and AMP8 (2025-2030) based on the total benefit (Ml/d) and the median industry forecast unit cost (£m/Ml/d).

The allowed modelled totex for this investment is £22.522m, compared to the requested allowance of £21.719m.

4.3 Our Representations

We support Ofwat’s approach to assessing water efficiency allowances. Given that the DD allowance was very similar to the totex included in our plan, we have kept the totex in our plan for water efficiency unchanged at £21.719m.

5 Growth at water recycling centres

5.1 Investment summary

	March 24 Business Plan (£m)	DD Ofwat position (£m)	Representation (£m)
Capex	161.2		264.2
Opex	1.4		1.0
Totex	162.6	265.8	265.3

In our updated data tables, these costs are reported against lines CWW3.153-CWW3.155 (Growth at sewage treatment works (excluding sludge treatment)) and associated CWW12 and CWW17 lines.

5.2 Context

The next 25 years will see significant population growth within the East of England, alongside more intense rainfall due to climate change. All of our Water Recycling Centres (WRCs) have been reviewed against thecurrent view of growth to understand whether they will be able to managewith the additional demand within the next AMP period. Where a risk hasbeen identified we have used a tiered approach to solutions, aiming tomanage the risk through no or low cost solutions where possible. Where investment is required to meet the demands of growth, a range of solutions have been identified, including but not limited to site optimisation and upgrading capacity through additional processes.

5.2.1 Ofwat's Draft Determination approach

The Draft Determination determined the proposed growth-related enhancement allowances through a combination of modelled allowances (which triangulated two scheme-level econometric models), deep-dive assessments of schemes which were identified as statistical outliers or having features that made modelling less appropriate, and a final adjustment to the allowed modelled and deep-dived permitted costs to account for previous underspend where historical funding has not been used or is not forecast to be used in AMP7.

The costs for the majority of our sites were determined primarily through modelling, conducted at a scheme level and including cost drivers such as expected change in PE, expected change in Dry Weather Flow permits, and expected process capacity added to meet current and expected quality permits. The overall modelled allowance determined through triangulation of the two models for each site was £276.9m at this stage.

Two sites (Cambridge and Stanbridgeford) were assessed through a deep dive of outlier sites due to the modelled cost gap. Ofwat determined that for both sites that compelling evidence was provided that the best option was selected and that the requested cost is sufficient, therefore permitting costs for these sites in full. This permitted an allowance for the outliers of £23.9m, making the total combined allowance for modelled and outlier costs £300.8m.

To reflect historic underspend of allowances in AMP6 and AMP7, Ofwat applied an adjustment to account for past delivery which reduced the allowance by £34.95m, to the final DD totex allowance of £265.87m. The adjustment was conducted separately for AMP6 and AMP7, and was based on the difference in the requested allowance and outturn (including forecast for AMP7) spend with cost sharing applied in each price review period.

5.3 Our Representations

We strongly welcome Ofwat's approach of using more granular and site-based cost driver data in setting its allowance for growth at our Water Recycling Centres. This marks a significant and positive step-change in approach which appropriately ties the level of investment back to the overall growth requirements for companies, and the specific investment needs at each site to accommodate the forecast growth.

Across our enhancement investments, we have sought to align our costs to those allowed in the Draft Determination, unless there are clear reasons not to do so. For growth at water recycling centres, we considered the cost efficiency evidence available to us to understand whether it would be appropriate to align our costs with those in the Draft Determination.

To develop the requested allowance in our PR24business plan, we applied our double-lock cost efficiency approach. We combined the costs developed from our scheme outturn costs and internal cost models, with external cost benchmarking from TR61. Using TR61, we were able to benchmark a £59m sample of our costs which were found to be lower than the industry benchmark. As a result we did not adjust our bottom up costs.

Ofwat's PR24 cost model provides a significant additional external benchmark to support our double-lock approach. This model utilises site-based granular detail of costs and cost drivers from all WaSCs. It thereby provides a strong like-for-like

benchmark for our costs which was not available to us ahead of the Draft Determination. This model suggests that the industry benchmark for the scope of our Growth at WRCs enhancement is £300.8m, nearly £140m more than the costs in our business plan.

Whilst our original business plan included £162.6m, our external cost intelligence (both from TR61, and now Ofwat's Growth at STWs cost model) suggests this could be insufficient to accommodate the level of growth investment at our Water Recycling Centres.

As a result, and in line with other parts of our plan - in our DD representations, we are adjusting our Growth at WRCs enhancement investment requirement to align with Ofwat's Growth at STWs enhancement cost model. Ofwat's modelling gives an allowance of £300.8m, to which a subsequent cost challenge is applied based on previous underspends to £265.9m. Whilst we set out the reasons for the variation between our previous business plans and delivery in responding to growth, we consider that the adjusted (lower) allowance provides an acceptable allowance which balances the view of external cost benchmarks and our bottom-up cost build up. We have therefore updated our requested totex for Growth at WRCs to £265.3m. We note that by adding additional schemes to reach this new figure we are also adding additional increases in the model drivers of capacity added to the treatment processes. This would lead to further increases in modelled allowance in the feeder model. However, as above, we consider £265.3m to be sufficient and do not request an uplift at FD.

As invited to by Ofwat in the Draft Determination we have taken the opportunity to review the schemes submitted in our plan following Draft determination. Through engagement with developers and local authorities we have an updated understanding of the location of new development and build out rates over the next AMP.

Following this review we have substituted out 10 schemes and brought in 9 new schemes. Significant inclusions in the updated submission include two of our larger works, Peterborough and Bedford WRCs. Both of these catchments have considerable domestic growth that will require investment in AMP8. Bedford is also to focus for major strategic projects that are likely to result in sustained levels of investment over multiple AMPs. We set this out further in our ADD19 data table commentary.

6 Microbiological treatment

6.1 Investment summary

	March 24 Business Plan (£m)	DD Ofwat position (£m)	Representation (£m)
Capex	32.3		189.1
Opex	1.6		5.9
Totex	33.9	31.3	195.1

In our updated data tables, these costs are reported against lines CWW3.88-CWW3.90 (Microbiological treatment - bathing waters, coastal and inland (WINEP/NEP)) and associated CWW12 and CWW17 lines. As noted in the enhancement strategy document relating to Storm Overflows ANH_DD_019 - the elements of the microbiological investments that contribute to spill reduction have been proportionately allocated to those lines in CWW3. [1]

6.2 Context

We will invest to meet new or tightened permit conditions for microbiological parameters at coastal or inland bathing waters or to address shellfish bed quality, driven by statutory WINEP obligations. Where our operations have an impact, investment is required to reducecontributions to the microbial load at designated bathing waters and shellfishbeds by improvements/disinfection of Final Effluent from water recycling centresand reducing spill frequency of storm overflows from our assets to <10 per yearor <2 per bathing water season in designated bathing waters.

6.2.1 Ofwat's Draft Determination assessment

Ofwat used a combination of benchmarking and shallow-dive assessment to assess efficiency. Although our costs were greater than the materiality threshold, Ofwat determined our costs appeared efficient through the cost model and therefore were not deemed to be an outlier.

Our requested allowance of £33.9m was accepted in full through the shallow dive assessment. The WINEP adjustment was applied post-assessment, reducing the allowed totex to £31.3m.

6.3 Our Representations

Since Business Plan submission, we have identified the need associated with UV disinfection for microbiological enhancement and have updated our requested totex allowance for microbiological treatment accordingly. We provide additional evidence to set out the need, options considered and cost efficiency of these schemes below should this investment now be assessed through Ofwat's deep-dive approach.

6.3.1 Need for investment

There are three main reasons for the additional investments included in the plan:

1. New designated inland bathing waters. In our October Business Plan we included a proposed uncertainty mechanism to allow us to invest if any of the prospective inland bathing water sites in our region were designated. Since then, three have had successful applications with our support. We have therefore included these within our totex.
2. Ongoing delays in production of design guidance from the EA (Validated Dose UV Design Guidance) and associated training has meant that our requested totex at the time of the Business Plan submission was significantly lower than we now know to be necessary. Our original plan was based on the previous guidance applicable to disinfection schemes AW had delivered in the past. After Business Plan submission, we learnt from Stantec (the guidance authors) that site-specific considerations significantly increase asset requirements (e.g. enhanced treatment trains to meet solids removal and pathogen kill, predominantly through membrane bioreactor plants (MBR) or activated sludge plants (ASP) the scale of UV treatment design, channels, lamp requirements and associated power upgrades (including additional Opex expected). In addition, low dilution factors in our region meant that we require higher levels of pathogen kill across the existing or proposed treatment streams (secondary or tertiary treatment). Lastly, the EA guidance on permitting has also materially changed the requirements of online monitoring, target dose delivery/resilience and permit compliance conditions for plant availability/uptime. The final EA guidance is now not anticipated until October 2024. Until it is published and the training rolled out, there is a risk that further modifications to the investments may be required.
3. The scale of changes as part of point no 2) specifically, has meant we have been disproportionately affected by this in both cost and programme terms,

1 Note that £7.7m of costs have been included in Microbiological treatment which should instead be classified as investigation. This allocation is highlighted in response to query OFW-REP-ANH-003

putting Anglian in a unique position amongst its industry peers, which have significantly smaller numbers of projects proposed.

Following discussion with the Environment Agency, we have agreed to increase the costs for 12 WINEP schemes to meet microbiological treatment requirements within the microbiological treatment enhancement strategy:

- 4 Shellfish obligation sites: (King's Lynn STC; Boston WRC; Maldon WRC; Tollesbury WRC)
- 8 Bathing Water obligation sites: (Woodbridge WRC; Sudbury WRC*; Manningtree WRC*; Oakham WRC; Haslingfield WRC*; Melton WRC; Southwold WRC; Easton WRC) [2]

Programme of expected UV Plant needs and supporting studies

Type 1 - confirmed required UV plants (as identified by AMP7 investigations) and hence have been included in our business plan totex:

1. Boston WRC
2. King's Lynn WRC
3. Southwold WRC
4. Maldon WRC
5. Tollesbury WRC

Type 2 - UV plants likely to be required pending the results of source apportionment investigations which will be complete by March 2027. These are now confirmed to be needed due to achieving DEFRA designation of these bathing waters and hence have been included in our business plan totex:

1. River Deben at Waldringfield Bathing Water Investigation likely to confirm a need for UV at Woodbridge WRC, Melton WRC and Easton WRC
2. Rutland Water BW Investigation likely to confirm a need for UV at Oakham WRC
3. River Cam at Sheep's Green BW Investigation likely to confirm a need for UV at Haslingfield WRC
4. River Stour at Manningtree BW Investigation likely to confirm a need for UV at Manningtree WRC
5. River Stour at Sudbury Friar's Meadow BW Investigation likely to confirm a need for UV at Sudbury WRC

Type 3 - Inland bathing water investigations for locations where we know through Get River Positive engagement that the community is working towards applying for DEFRA designation but has not successfully done so yet. These investigations will only take place if the local community successfully achieves DEFRA bathing water designation. The earliest these bathing water investigations could report (if they take place) would be March 2028:

1. River Deben at Woodbridge BW investigation - extended River Deben bathing water investigation scope (on top of the River Deben at Waldringfield Bathing Water Investigation referred to under type 2 above) to allow for a tracer release study at the proposed Woodbridge bathing water (which would be closer to our outfalls). This may confirm a need for UV at Woodbridge WRC, Melton WRC and Easton WRC, if not already confirmed by the 2027 investigation report.
2. River Waveney at Falcon Meadow BW investigation. This could identify a need for UV at Earsham WRC and CSO spill reduction work in Bungay - these investments are not in our business plan.
3. River Ouse investigation, Odell. This could identify a need for UV at Odell WRC - these investments are not in our business plan.
4. Grafham Water, and Alton Water investigations - these investments are not in our business plan.
5. Canvey Island. This could identify a need for UV at Canvey Island WRC - these investments are not in our business plan.

The current obligation date for the 12 schemes that are in our PR24 plan is March-July 2027 period, which creates a delivery risk - we have notified the Environment Agency that these dates are no longer achievable given the increases in scope and are currently in conversation with the EA to extend these obligation dates until 2030. At the time of writing, no licensed UK lab that can undertake some of the key sampling or testing required in the new guidance set out by the EA exists. The current EA guidance and associated requirements stipulate that sampling must be undertaken over 12 months to inform designs, leaving only 18 months to design, build and commission the projects, some of which are individually over £60m. Therefore, whilst there is currently an obligation date of 2027 for these schemes, this should not be assumed to be the delivery date for the purpose of setting any Price Control Deliverables. We also propose that the only possible PCD that we feel is appropriate is the number of confirmed schemes delivered. This is because spend and achieved microbiological removal based targets are significantly under risk owing to third party issues beyond the company's ability to singularly control and provide guarantees on (EA unfinished guidance, evolving design, EA approval required for sampling and design envelope confirmation and stage progression, limited lab opportunities/delays for required design analysis, and planning/enabling constraints).

2 This includes the three newly designated Bathing Waters which were originally included in our bathing water uncertainty mechanism (*)

We have also reflected the sector-wide impact of the EA increasing costs for UV disinfection enhancement schemes, associated with the sampling regime to inform scheme design. The UV validated dose guidance has an expectation that water companies carry out 1 year of wastewater sampling, characterisation and UV dose-response analysis to inform the site specific design and permitting of each UV plant. There will then be a process of agreeing design and permitting requirements with the EA, although uncertainty remains on the full scale of the required changes given the EA's unfinished UV design guidance. As noted above and in query OFW-REP-ANH-003 we request the costs of investigations are reallocated and assessed separately.

Despite the uncertainty we provided a cost build up of investment as understood at time of writing. As with other WINEP schemes we have updated the costs associated with permit fees in line with the latest published charges.

We understand that other companies may have been working with Stantec under a UV consultancy framework to deliver AMP7 work and possibly used Stantec's advice to also better inform their original PR24 cost intelligence updates and business plans (we note Ofwat's feedback to UU in particular suggesting that not enough evidence was provided). There is also the possibility that other water companies have also missed the significance of the shift in UV pathogen and log kill that is intended from the draft guidance.

Long-term strategy

One of our stated 2050 LTDS ambitions is to recycle all effluent rather than discharge to the marine environment. The proposed UV investment marks a big step on the way towards that ambition for our coastal sites. Upgrading the effluent quality will make it more viable to use that flow in future to support environmental enhancement, or to support growth, with customers benefiting from lower unit costs for re-use schemes. We acknowledge that the current driver in AMP8 WINEP is human health, but this is a low-regret investment for our long-term vision for coastal sites.

6.3.2 Interaction with base expenditure

The additional investment requirements are driven by the need to meet a new requirement (i.e. tightened microbiological parameters), in particular the UV plants and extensions to existing secondary or tertiary treatment stages. For our investments we have analysed the scope, to assess the risk of overlap with base expenditure. In some of these investments we propose to build new disinfection equipment and new secondary treatment processes alongside old biological trickling filters, and then to decommission the existing secondary treatment (trickling filters) when the scheme is complete. This is because trickling filters have a lower efficacy of pathogen and virus removal than activated sludge plants.

Where the schemes can potentially lead to the decommissioning of existing equipment in time, we conducted further analysis to establish if there is a risk of overlap and whether we would get any maintenance benefit from the decommissioning of those old assets, and remove this from our enhancement allowance.

To quantify the maintenance benefit of decommissioned equipment, we considered asset age and the implicit allowance in prior maintenance spending, with a view to using both to offset that benefit from the enhancement investment. We found the age of existing trickling filter assets across the proposed sites varies from 3 years (for a recently replaced washwater pump) to 74 years (for an original filter tank structure), with an overall average of 39 years for all civil and mechanical assets. The average age of civil assets is higher than mechanical and electrical (48.6yrs vs 30yrs). The implicit allowance is not available from econometric modelling, so we have analysed our own historic data. We have spent across all of our c1,200 Water Recycling Centres:

Table 4 Spend analysis

Code	Name	Ave £m/yr 2011-23	Ave £m/yr 2018-23
5500	Maint. - Sewage Treatment Works - Civil	9.52	5.34
5501	Maint. - Sewage Treatment Works - M&E	26.71	18.87

We are also able to see from cost capture of completed capital schemes that in the period from 2011-23 we spent around 2% of total capital maintenance (c£9m) on trickling filter maintenance across all WRCs, of which £193k was specifically on these sites. Trickling filters are a low-tech and therefore low maintenance asset type compared to other asset types such as screens, blowers and tertiary filtration. Taking these two separate approaches, this implies a maintenance allowance in a range of around c£2k to c£30k per year per site for capital maintenance.

Based on this, we believe the proportion of maintenance would be immaterial for these schemes when compared with the additional maintenance costs of the new equipment.

For clarity, our proposed investments do not contain any investment to address known maintenance/growth issues and will rely on the establishment of such schemes post determination after further in depth sampling and analysis is carried

out on sites to confirm the scope required. We also had no asset investment plans in AMP8 to replace any of these sites biofilters from scratch, as the performance on sites are still at an acceptable level and permits are being currently met.

6.3.3 Best option for customers

We have worked with Stantec to shape the proposed investments based on its considerable process knowledge of microbiological treatment and understanding of the draft EA guidance. Investment choices have been limited due to the constraints of the EA guidance (i.e. UV treatment is the only technique for disinfection allowed by the EA to meet validated dose, and guarantee log removal). Recognising the impact on customer bills, we have taken a proportionate approach to the design of schemes. For example, at Boston, we do not propose to upgrade the secondary treatment Trickling Filters to an Activated Sludge Plant but to add tertiary solids removal to the existing plant. When assessing/proposing the need for additional humus and final tank capacity associated with the proposed solutions, we assumed that the existing capacity will be sufficient at this point in time. We commissioned external technical assurance during the DD window, whereit was noted that there would be sufficient justification to add the extra capacity at this stage, based on Stantec's recommendations and that we are potentially underestimating costs, but we have not increased our estimate at this stage.

Whilst we have indicative costs for alternatives - such as pump-away solutions - these are not considered viable from a technical perspective for any site other than the small 200 Population Equivalent works at Easton in Suffolk which will transfer flows to Framlingham.

In particular long sea outfall options were considered to be non-viable on a technical level. These would likely entail greater than 5 year programmes and have low confidence of delivery. The solution ultimately relies on stable dilution and currents (these may possibly change in the future in such a way that it would require further extension of the outfall and even now there may be situations where the system short circuits and we might still observe impacts).

Membrane Bio Reactors (MBR) are a lower confidence solution for pathogen removal than an activated sludge plant (ASP) based solution. This reflects fewer operational installations across the industry, vulnerability to high fouling conditions (e.g. membrane chemical treatment to clean membrane will have to be closely checked/controlled) and lower asset future proofing ability (e.g. changes in flow/loads/new nutrient permits will be harder to accommodate with an MBR than with an ASP). Although we have little experience of installation of MBR systems, we have obtained cost estimates from our supply chain based on the proposed plant at the new Cambridge works. We have not built in any risk or optimism bias.

As advised by Stantec a tertiary solids removal (TSR) & UV option needs to be considered on a site by site case basis as the process risks are very high, owing to the fact that the TSR must be specified to work in conjunction with the disinfection stage. TSRis an option mainly on sites that have sufficient existing secondary treatment capacity.

For many options in line with guidance we split the scope between stormstorage (for spill reduction purposes) and microbiological treatment. The EA's suggested guidance on temporary discharges (i.e. storm), mandates UV on storm discharges above the relevant spill reduction target. Across the board we have included scope for additional storm storagetoavoid UV treatment on storm(whilst ensuring no double counting with EnvAct_IMP4 schemes), as it is more cost effective and a better outcome for customers. UV on storm discharges incurs far higher OPEX than a storagesolution, and soUV treatment on storm was discounted from our option selection.

Our third party technical assurance provided by AECOM has concluded that:

a Our approach of scoping and cost benefit analysis, is reasonable given the recommendations for solutions from Stantec

b Growth and maintenance additions are not present in our currently scoped solutions and will have to be added separately to ensure a holistic approach. As explained earlier in this document, we have chosen to separate the scopes for these drivers at this stage to avoid double counting; where possible interactions with other existing other WINEP investments resulted in removal of common scope and ensuring that the investments are effectively independent. The exception to this is Southwold which was an AMP7 scheme base on the old Microbiological guidance methodology and was funded in AMP7and thus is partly (28%) allocated to base maintenance to cover the AMP7 allowance.

c Overall we have taken risks in our solutions strategy and that we had sufficient evidence for our submission to make additional representations particularly with regards to humus/FST capacity if we had chosen to do so.

Our updated plan reflects the most cost efficient delivery strategy we have available to meet all the proposed requirements whilst retaining high confidence and an acceptable level of process risk at all our proposed sites. These proposed changes/scopes have been moderated by Stantec and AECOM to ensure that we can meet the new permit regulation and avoid unnecessary conservatism/overdesign.

The following tables have been produced by Stantec as part of their support for investment scoping. We can provide further information relating to the work undertaken by Stantec on request.

Table 5 Shellfish water sites summary

	Site	Secondary treatment process	DF (log10)	SFW target, E.Coli cfu/100ml	End of pipe E.Coli target, cfu/100ml	UV target dose (based on virus reduction)	Comments/ additional treatment
1	King's Lynn STC	ASP	2.1	110	13,850	30mJ/cm2 (based on dilution uncertainty)	Current FE geomean E.coli: 10,000 cfu/100ml (95%ile: 300,000 cfu/100ml. Extend existing ASP to increase sludge age/possible trade pre-treatment/sludge liquor treatment/ possible TSR plus UV
2	Boston WRC	TF	2.5	110	34,790	30mJ/cm2 (based on dilution uncertainty)	FE effluent geomean E.coli: 350,000 cfu/100ml, 95%ile: $2.3x10^6$ cfu/100ml Existing Trickling Filters + TSR + UV (potential medium to high risk due to elevated E.coli in effluent pre-UV).
3	Maldon WRC	ASP	3.4	5	12,560	ASP + UV 40mJ/cm2 (based on dilution uncertainty)	Extend existing ASP + UV
4	Tollesbury WRC	TF	0	5	5	40 mJ/cm2	Upgrade treatment with ASP + TSR + UV

Table 6 Bathing water sites summary

	Site	Secondary treatment process	Secondary treatment virus credit	DF (log10)	Virus reduction through disinfection (log10)	FIO reduction through UV (log10)	UV target dose (based on virus reduction)	Comments/ additional treatment
5	Woodbridge WRC	TF	0.3	3.1	4.4-0.3-3.1=1	5.4-1.5-3.1+0.8	20 mJ/cm2	Upgrade to ASP + UV
6	Sudbury WRC	TF + NSF	1.5	0.8	4.4-1.5-0.8=2.1	5.4-2.0-0.8=2.6	40 mJ/cm2	Update with long sludge age ASP + UV
7	Manningtree WRC	TF	0.3	2.6	4.4-0.3-2.6=1.5	5.4-1.5-2.6=1.3	40 mJ/cm2	Update with long sludge age ASP + UV
8	Oakham WRC	TF + MBBR	0.3	4.0	4.4-0.3-4.0=0.1	5.4-1.5-4.0=(0)	20 mJ/cm2	Existing treatment (assuming no

	Site	Secondary treatment process	Secondary treatment virus credit	DF (log10)	Virus reduction through disinfection (log10)	FIO reduction through UV (log10)	UV target dose (based on virus reduction)	Comments/ additional treatment
								operational/performance issues) plus UV (for 1 log virus)
9	Haslingfield WRC	TR + Ox ditch	0.3	1.5	4.4-1.5-1.5=1.4	5.4-2-1.5=1.9	40 mJ/cm2	Upgrade existing TF with ASP/ oxidation ditch + UV
10	Melton WRC	TF	0.3	3.7	4.4-0.3-3.7=0.4	5.4-1.5-3.7=0.2	20 mJ/cm2	Existing treatment (assuming no operational/performance issues) plus UV
11	Southwold WRC	TF	0.3	3.3	4.4-0.3-3.3=0.8	5.4-1-3.3=1.1	20 mJ/cm2	Upgrade ASP + UV (plus 1 additional PST)
12	Easton WRC	Aeration tank	0	5.5	4.4-5.5=(0)	5.4-5.5=(0)	20 mJ/cm2	Transfer all wastewater flows to another works (based on the fact that this is a very small 200 PE works)

6.3.4 WINEP capping adjustment

We consider that the WINEP capping adjustment should be updated to reflect the revised costs and evidence of our WINEP programme, and allow the efficient costs from this programme (as assessed currently through the shallow-dive).

6.3.5 Cost efficiency

The development of the microbiological treatment costs in our plan follows our cost efficiency 'double lock' approach set out in chapter 7 of our Business Plan. Through this approach we have ensured that are costs are efficient in their bottom-up build up, and this is cross-checked through external benchmark approaches. This section sets out how we have ensured cost efficiency of our microbiological treatment investments through step one of our double lock approach. Step 2 is explored in the benchmarking section below. We have taken a robust approach to developing our microbiological treatment costs, building on our experience from delivering similar schemes into the bottom-up development of costs. The detail of the cost development approach is set out below, along with a breakdown of costs we provide in table CWW3.

Cost Estimation Methodology

We follow a common cost development methodology across our enhancement investments in a three phase process:

1. Establish cost and carbon models
2. Input the cost drivers into the model (including location specific factors)
3. Data validation, internal challenge and assurance.

Phase 2; We derived our total cost estimation for each scheme by gathering location based data on the factors that influence cost estimates, including:

- modelling of storage required
- Full Flow to treatment (FFT m3/d)
- topography and surface types (i.e. roads, field, verge)
- construction techniques and applicable materials
- current site assets configuration and capacity
- operability and connection to existing assets
- site specific requirements and
- assessment of construction constraints such as SSSI areas

Southwold WRC has been estimated with the new guidance and we have discounted the cost that have been founded in AMP7 scheme, the value represent 28% of the total new scope estimated.

To meet Ofwat's expectation of a further cost breakdown, in the separate cost efficiency appendix we provide a full cost breakdown for each site where we propose investment.

We have updated our requested totex to £195.1m. This reflectsour view of the appropriate efficient costs of this investment. In line with the table guidance requiring schemes that achieve more than one driver, some of the costs required for the UV schemes reflect storm tank capacity to reduce spills and are reflected as an increase to the costs of our storm overflows enhancement strategy. In the cost breakdown appendix 'Microbiological Summary', we provide the cost breakdown between the drivers and the corresponding CWW3 lines.

To ensure the costs we have proposed are efficient, we partnered with Mott McDonald and AECOM (COCE) to compare our costs for these investments with comparable schemes across the industry. Our benchmarking partners considered the full cost breakdown of all 12 schemes in the programme representing £237m of costs. COCE has provided a full comparison of cost at asset level on each project and provide an efficiency assessment at programme level .

Table 7 AW PR24 Benchmarking Microbiological Disinfecton (from COCE benchmarking report)

Scheme No	Scheme	AW Capex (£m)	Benchmark (£m)	Varience
I031443	King's Lynn STC Disinfection	57.90	59.18	-2.15%
I031886	Boston WRC Disinfection	24.61	32.82	-25.02%
I033697	Maldon WRC MALDST Disinfection	32.82	33.17	-1.07%
I031905	Woodbridge WRC WOODST Disinfection	23.07	23.59	-2.19%
I040840	Sudbury WRC SUDBST Disinfection	24.09	24.15	-0.27%
I040818	Manningtree WRC MANNST Disinfection	17.42	15.80	10.26%
I040871	Oakham WRC OAKHST Disinfection	6.66	7.67	-13.16%
I040852	Haslingfield WRC HASLST Disinfection	12.29	11.99	2.43
I031906	Melton WRC MELTST Disinfection	5.18	5.44	-4.78%
I031762	Southwold WRC Disinfection	17.37	17.43	0.35%
I031837	Tollesbury WRC Disinfection	12.09	12.59	-4.04%
I031776	Easton WRC ESTNST Disinfection	3.86	4.44	-13.01%
	Total	**237.35**	**248.28**	**-4.40%**

Overall, the estimated costs are aligned to the sector benchmarks, and appear to be reasonable costs for the scopes of work as currently defined. Each project contains some elements which are costed above the benchmark equivalents, and some below, and the total costs are within the degree of estimating uncertainty expected of an AACE Class 4 estimate, demonstrated that we are 4.4% efficient compared with the industry same type of assets. Please see ANH_DD_075 for more detail of AECOM's report. Motts report is available on request.

Anglian Water Services Limited
Lancaster House
Lancaster Way
Ermine Business Park
Huntingdon
Cambridgeshire
PE29 6XU

anglianwater.co.uk