Appendix 6 – Providing excellent drinking water quality: Response to IAP

Wessex Water

March 2019

Wessex Water
YTL GROUP

Summary

This appendix provides additional evidence in relation to Ofwat's cost assessment for drinking water quality for the following drivers:

- Raw water deterioration
- Meeting lead standards.

The table below summarises the additional evidence provided, our response to the cost assessment in the initial assessment of plans received in January 2019 and the actions that we suggest Ofwat could take prior to the draft determination. The values stated are the total proposed expenditure that Ofwat has not made adequate allowance for.

Ofwat model / Driver	Our response	Value £m	Suggested actions for Ofwat
Raw water deterioration (WS2 line 13) • Asset solutions for nitrate compliance at Sturminster Marshall/Shapwick and Fonthill Bishop	Additional evidence provided regarding robustness and efficiency of costs, and scale of flows, as requested to allow Ofwat to improve their assessment.	2.23	Review deep dive assessment based on the latest evidence.
Raw water deterioration (WS2 line 52) • Catchment management enhancement opex	We consider that the IAP base cost models do not allow for the costs of catchment management required to deliver drinking water protection and additional benefits over the next five years. The approach to cost assessment in the IAP appears to be a disincentive to adopting catchment management.	2.05	Allow the catchment management enhancement opex costs, subject to a potential negative adjustment for any implicit allowance (provided there is robust evidence of the scale of implicit allowance).
Meeting lead standards (WS2 line 45) • Lead communication and customer service pipe replacement	We consider that the IAP base cost models do not allow for replacement of lead customer supply pipes, which is allocated to opex. This is part of the statutory obligation agreed with DWI. Based on the deep dive on others' costs our overall unit rate is efficient. We consider that any implicit allowance is likely to be insignificant.	5.71	Review allocation of costs between opex and capex. Consider a totex unit cost model.
Total		9.99	

Contents

1. Introduction

This document provides our response to Ofwat's initial assessment of plans (IAP) published on 31 January 2019 with respect to drinking water quality. Relevant documents in our September 2018 submission include section 5.6.4 of our main business plan narrative *For You For Life* and *Supporting document 5.3 – Providing excellent drinking water quality*.

In this document we provide additional evidence and responses in relation to the cost assessment for:

- Raw water deterioration
- Meeting lead standards.

2. Raw Water Deterioration

Business plan table and Line ref: Table WS2 Lines 13 and 52.

The IAP deep dive on our investment proposals for raw water deterioration resulted in a reduction in the capex allowances. We provide below the additional evidence requested.

In addition Ofwat have disallowed the enhancement operating costs included in business plan Table WS2 and we explain why these costs are integral to the delivery of our drinking water quality programme.

2.1 Raw water deterioration - Asset solutions

2.1.1 Ofwat's cost assessment

In the deep dive on raw water deterioration our proposals received four passes and a partial pass, as follows:

- Need for investment – pass
- Management control – pass
- Best option for customers – pass
- Robustness and efficiency of costs – partial pass
- Customer protections – pass.

In their assessment Ofwat state that they make allowance using the lower cost estimate for Fonthill Bishop and the cost estimate for Shapwick/Sturminster, and that they would be able to make an improved assessment if the following additional evidence was provided:

1) further separation of costs elements – this is provided in section 2.1.3 below
2) the scale of flows to be treated – refer to section 2.1.2 below.

2.1.2 Background

As described in *Supporting document 5.3 – Providing excellent drinking water quality*, our investment proposals for nitrates, which are supported by the DWI, comprise blending in parallel with catchment management.

At some of our water sources raw water nitrate concentrations are rising such that compliance with the mandatory standard for nitrates in drinking water has happened or is imminent. Other interventions have failed to arrest the deterioration in raw water quality and the options assessment shows that the best option is blending. The sites are:

- Sturminster Marshall/Shapwick – the two sources combine at one treatment works
- Fonthill Bishop.

In parallel with blending it is necessary to undertake catchment management to avoid gross deterioration in the raw water nitrate concentrations that would make blending not viable.

Sturminster Marshall/ Shapwick

This option would involve construction of blending facilities at Sturminster Marshall water treatment works to enable blending of low nitrate water from Black Lane water treatment works with Sturminster Marshall/Shapwick source water to ensure compliance with the mandatory compliance standards for nitrates in drinking water. Water resources modelling has demonstrated that the blending arrangement would not have any significant impact on yields. The sources involved are not subject to any sustainability reductions. There are no sustainability concerns regarding abstraction from these sources.

The scale of flows is shown in the Table 2-1 below.

Table 2-1: Sturminster Marshall/Shapwick flows

Site	Typical flow Ml/d	Peak flow Ml/d
Sturminster Marshall & Shapwick (combined)	18	30
Black Lane	8	10
Total – blended flow	26	40

Fonthill Bishop

This option would involve constructing a pipeline from Fonthill Bishop to Littledown with blending facilities at Littledown service reservoir to enable blending with low nitrate water from Whitesheets service reservoir and/or the south via our integrated Grid network to ensure compliance with the mandatory compliance standards for nitrates in drinking water. Water resources modelling has demonstrated that the blending arrangement would not have any significant impact on yields. Fonthill Bishop has already been subject to a sustainability reduction, which is allowed for in our WRMP.

The scale of flows is shown in Table 2-2 below.

Table 2-2: Fonthill Bishop flows

Site	Typical flow Ml/d	Peak flow Ml/d
Fonthill Bishop	5	7
Littledown	10	20
Total – blended flow	15	27

2.1.3 Cost estimates

Each scheme was costed in accordance with the process described in *Supporting document 8.11 – Costs of our enhancement programme*, submitted in September 2018.

The costs are summarised in the Table 2-3 below with detailed cost estimate breakdowns in Table 2-4 below. The costs for each site were set out in Table 2-3 of *Supporting document 5.3 – Providing excellent drinking water quality.*

Table 2-3: Summary of costs

Scheme	Capex £m	Opex £k per year
Sturminster Marshall / Shapwick	2.177	£20k per year *
Fonthill Bishop	7.652	£40k per year *
Total	9.829	

* scheme completion is in 2025 so no opex is included in our PR19 plan.

Our methodology for cost estimating was set out *Supporting document 8.11 – Assessing the costs of our enhancement programme* submitted in September 2018. We benchmarked a sample of enhancement schemes, including construction costs for water supply enhancement schemes and the non-construction costs, which showed that our costs estimates were robust and efficient compared with the external market place.

Table 2-4: Detailed breakdown of costs

Item	Sturminster Marshall / Shapwick £k	Fonthill Bishop £k
Construction Value		
Civil work items Labour, Plant, Material & Subcontract packages	469	2,352 (incl pipeline)
Mechanical and Electrical work items Labour, Plant, Material & Subcontract packages	479	1,369
Supervision and Prelims	386	760
Contractor Fees	119	419
Total Construction Value:	1,453	4,901
Design & Project management	335	1,178
Third party	62	424
Risk (15%)	327	1,148
Total Scheme Cost:	2,177	7,652

2.1.4 Conclusions

In the deep dive Ofwat state that they make allowance using the lower cost estimate for Fonthill Bishop and the cost estimate for Shapwick/Sturminster and that further separation of costs elements and scale of flows to be treated would allow them to make an improved assessment.

In response we have provided above:

- A breakdown of the cost elements for each scheme as per Table 2-4 above
- Information on the scale of flows as per Tables 2-1 and 2-2 above.

We would request that, on the basis of the additional evidence provided above, the deep dive partial pass for the robustness and efficiency of costs gate is turned to a pass, and the capex costs set out above are allowed for. This would increase the cost allowance by £2.23m to £9.83m.

2.2 Raw water deterioration - Catchment management enhancement opex

2.2.1 Ofwat's cost assessment

Ofwat have disallowed all enhancement opex. Opex for raw water deterioration of £2.05m was included in business plan Table WS2. We provide below an explanation of why enhancement opex costs should be allowed.

2.2.2 Background

In *Supporting document 5.3 – Providing excellent drinking water quality* we explained that our catchment management programme for the next five years would include work at 24 sites protecting 223 Ml/d of deployable output, as summarised in Table 2-5 below.

As explained in our Water Resources Management Plan raw water quality is a threat to our available water resources. Around 75% of our raw water comes from groundwater sources and the majority of this is from unconfined chalk aquifers. Due historical changes in land use and the use of artificial fertilisers, the concentration of nitrates is rising in many of our sources. Surface water sources are also vulnerable to contamination from pesticides. Our long standing approach has been to try to address these issues at source rather than build additional assets.

The catchment management programme, including the particular sites, is supported through the Environment Agency's National Environment Programme, as noted below. In addition the DWI endorse the approach as part of source to tap management of drinking water quality.

Table 2-5: Supporting document 5.3 Table 2-2: Catchment management programme 2020-2025

	Parameter	Sites	Total peak deployable output Ml/d	Regulatory support
Current catchment management sites that will continue from 2020	Nitrates	13	107	6 sites Environment Agency through NEP
	Pesticides (incl. Metaldehyde)	4	69	4 reservoir sites Environment Agency through NEP
Proposed new catchment management sites from 2020	Nitrates	6	18	Environment Agency through WINEP
	Pesticides (incl. Metaldehyde)	1	29	
Totals		24	223	

2.2.3 Operating costs

Our regulatory accounting treatment for catchment management is that the cost of catchment management, including the cost of the catchment advisors, associated field equipment and physical work in the catchment, is treated as enhancement capex for the first AMP. For future AMPs it is treated as opex, once the catchment approach is deemed to be successful.

In 2020 the current enhancement catchment management programme will move from capex to enhancement opex. The benefits of this work go beyond those achieved in AMP6. Additional benefits that will accrue include:

- protecting a total yield of 176 Ml/d in the context of needing to provide greater levels of resilience in our Water Resources Management Plan and in operational resilience
- avoiding deterioration in raw water quality that might drive the need for asset solutions (e.g. blending or treatment)
- extending the work to cover other parameters (pesticides, domestic oil spills)
- increased biodiversity from cover crops for nitrates control and buffer strips and reduced application of pesticides.

The opex allowance is summarised in the Table 2-6 below:

Table 2-6: Opex proposals

Parameter		Sites	Total peak deployable output Ml/d	Opex 2020 – 2025 £m
Current catchment management sites	Nitrates	13	107	£2.05m
	Pesticides (incl. Metaldehyde)	4	69	

Ofwat have disallowed this cost, due to their blanket approach to disallow all enhancement opex costs.

2.2.4 Discussion

We do not agree that all the enhancement operating costs for catchment management should be disallowed. We set out below some possible reasons:

- The econometric models for wholesale water base service do not include explanatory variables related to catchment management. The catchment management programme aims to avoid investment in treatment solutions, and therefore the explanatory variables related to treatment works complexity do not change. As an example we have considered the impact on modelled base costs due to changes in treatment complexity as if catchment management had not been adopted. Box 1 below includes a detailed example.

- We consider that there should not be a penalty for adopting catchment management.

- Our approach over the past 10 to 15 years has been to maximise the opportunities from catchment management. This has enabled us to avoid or defer the need for investment in treatment solutions, thus achieving efficient totex delivery to the benefit of our customers

Box 1 – Cost impact of not adopting catchment management

If catchment management was not practised, treatment work enhancements would comprise the installation of ion exchange, which would move the works to treatment category W4 (single stage complex physical or chemical treatment including nitrate removal) i.e. complexity 5. The only other alternative of blending would not be viable, as blending requires a low nitrate source to blend with a high nitrate source; if all sources in an area have high/non-complaint nitrate concentrations then blending doesn't work.

The table below shows the impact of 50% of the nitrates catchment management output in Table 2-5 above (54 Ml/d) moving from treatment complexity treatment category GW1/complexity 2 to treatment complexity 5. Catchment management requires the voluntary cooperation of farmers and land owners, and sometimes requires major changes to agricultural practice within the catchment to a source. These are not guaranteed and can take many years of engagement to secure. The assumption that half of the nitrates catchment management schemes by output may require a treatment solution is a reasonable assumption for the purposes of this example.

Catchment management approach							
As business plan tables		2020-21	2021-22	2022-23	2023-24	2024-25	
Water treated 3 - 6	Ml/d	161	161	161	161	161	
Water treated	Ml/d	335	335	335	334	334	
% water treated 3-6	%	48%	48%	48%	48%	48%	
Weighted average treatment complexity		3.40	3.40	3.40	3.40	3.40	
Modelled costs	£m	89	88	87	86	85	435
If treatment provided instead of catchment management							
Revised input paramters		2020-21	2021-22	2022-23	2023-24	2024-25	
Increase in water treated 3-6	Ml/d	54	54	54	54	54	
% water treated 3-6	%	64%	64%	64%	64%	64%	
Increase from GW1 (2) to GW4 (5)	Ml/d	54	54	54	54	54	
Revised weighted average treatment complexity		3.88	3.88	3.88	3.88	3.88	
Modelled costs from Ofwat model FM-WM4. Approx.	£m	92	91	90	88	87	448

The modelled botex costs would increase by around £13m over five years, which is some six times greater than the costs we have submitted.

We recognise that there may be an implicit allowance for catchment management within Ofwat's base service costs allowances. The following considerations seem relevant to form an understanding of the implicit allowance for enhancement opex, if any, for meeting raw water deterioration:

1) The quality of raw water varies across the industry and over time. Four of Ofwat's base cost econometric models control for this in some way.

2) If Ofwat's models used a direct measure of the underlying quality of raw water for each company, and if Ofwat's forecast explanatory variables for the 2020-25 period captured the forecast changes in raw water quality over this period *in the absence of mitigation measures by the water company*, then there might be grounds to identify

an implicit allowance, within the base cost models, for the additional opex associated with the forecast deterioration in raw water quality.

3) However, Ofwat's econometric models of base costs control for differences in raw water quality between companies, and over time, through the inclusion of a variable capturing the complexity of water treatment processes, rather than variables relating to the underlying quality of the raw water itself. Specifically, in two of these models, this is done through the inclusion of a variable defined as the percentage of water treated at water treatment works with a treatment complexity level from 3 to 6. In the other two models, it is done through the inclusion of a variable constructed as a weighted-average of the complexity of treatment given. In all four models, the estimated coefficients on those complexity variables are positive, suggesting a positive relation between the complexity of the treatment and companies' base costs. The treatment complexity variable is a proxy measure and does not accurately capture the underlying raw water quality. Furthermore, Ofwat's approach to forecasting the explanatory variables does not consider how raw water quality may change over the period 2020-25. In these circumstances, the explanatory variables in the econometric models of base costs do not provide for any implicit allowance for the opex (or other costs) arising from deterioration over time in raw water quality.

4) One way that water companies may tackle deterioration over time in raw water quality is through solutions that involve catchment management and which avoid (or reduce) the need for increases in treatment complexity (e.g. ion exchange for nitrate removal). Insofar as water companies have undertaken catchment management solutions to tackle water quality issues in the 2011-2018 period, then there may be some costs relating to catchment management solutions implicit within allowances from the base cost models. The next question is how much – or rather how can a reasonable estimate or assumption of that implicit allowance be made?

5) The relationship between catchment management costs and resulting benefits to raw water quality does not seem straightforward. Depending on the details of the initiative and arrangements, some of the costs from catchment management will be costs that provide only benefits in the year they are incurred while some of the costs will provide benefits beyond the year in which they are incurred. Furthermore, there may be differences between companies and over time in the accounting and capitalisation policies taken towards catchment management. These issues add some complexity to the interpretation of potential implicit allowances relating to catchment management.

6) In the absence of detailed investigation of point (5) above, and in the absence of further evidence and analysis to the contrary, we think that a reasonable starting point is that base cost allowances provide for the costs of to perform a historical industry-average level of catchment management (given the scale of the company) over the period.

7) It is probable that companies that make greater use of catchment management solutions relative to water treatment solutions will tend to have lower operating expenditure at water treatment works (all else equal). If Ofwat's approach for the IAP

base cost allowances had been to use forecast explanatory variables that implied increases in water treatment complexity over time for Wessex Water (due to raw water deterioration) then this might have provided some opex contribution to the costs of addressing raw water deterioration. But this is not how Ofwat made its forecasts, so this potential relationship between catchment management and water treatment costs does not seem to undermine or limit the point.

8) Available data is limited but we consider that our catchment management programme for 2020 -25 is greater than the industry average level for the 2011-2018 period. Thus the cost we have proposed are over and above any implicit allowance included in the base cost allowances.

2.2.5 Conclusions

Ofwat have disallowed all enhancement opex, including the enhancement opex for catchment management related to protecting raw water quality at our drinking water sources and other additional benefits in AMP7, such as resilience and biodiversity.

The explanatory variables used in the models for base cost do not reflect underlying changes in raw water quality.

Catchment management is the most appropriate initial approach to mitigating raw water deterioration. Catchment management has strong support from the Drinking Water Inspectorate and the Environment Agency. It is lower cost, which benefits customers, and it delivers other benefits for the environment. The approach to cost assessment in the IAP is a disincentive to adopting catchment management, which we consider is a retrograde step. It incentivises the use of capex solutions which is contrary to the totex principle set out in Ofwat's PR19 methodology – intended to encourage efficiency and innovation.

We would request that, on the basis of the additional evidence provided above, the catchment management enhancement opex costs set out above are allowed in full, subject to a potential negative adjustment for any implicit allowance (provided there is robust evidence of the scale of implicit allowance).

3. Meeting lead standards

Business plan table and Line ref: Table WS2 Lines 6 and 45.

3.1 Ofwat's cost assessment

The cost assessment for meeting lead standards in drinking water is based on triangulation of two models to provide a capex only cost allowance. Only one company, not Wessex Water, was subject to a deep dive assessment.

Our main concern with the IAP assessment for meeting lead standards is the treatment of the opex element of our enhancement costs, and we focus on the opex element in this section. However, based on the discussion below, there is some interaction between the capex and opex costs for lead pipe replacement, therefore considering the two elements together may be beneficial.

The £5.7m opex provision included in our business plan Table WS2 has been disallowed and we explain why these costs are integral to the delivery of our drinking water quality programme.

We are not proposing to install any further phosphate doing plants for plumbosolvency control, therefore all the costs, including the opex amounts, in our plan for lead are for lead communication and customer supply pipe replacement.

3.2 Background

Lead is a significant public health issue. Lead is harmful to health, particularly to young children. It is generally recognised that there is no safe limit for lead in drinking water. Exposure to lead through other materials and in the workplace, such as petrol, paint and batteries, has been progressively reduced through legislation and the same approach applies to drinking water. The prescribed concentration for lead in drinking water was reduced in 2013 to the current value of 10 µg/l, with the point of compliance being the consumer's tap. There are likely to further reductions in the future. Thus removing lead is completely aligned with delivering good outcomes for customers.

As described in *Supporting document 5.3 – Providing excellent drinking water quality*, our investment proposals for lead, which are supported by the DWI, include a long-term ambition to replace all lead pipes (communication and supply pipes) by 2040. Over the next five years, this will be achieved through:

- a strategic planned approach, which will be more cost effective and enables targeted pipe replacement
- annual review of District Metered Areas (DMAs) to identify suitable locations for proactive replacement of lead pipes
- replacement of lead pipes identified through sample failures
- we will aim to remove all lead at least up to point of entry into the property
- maximising synergies with metering and leakage programmes as part of a customer focused campaign on plumbing issues.

As set out in our performance commitment definitions:

- The communication pipe is defined as the pipe from the distribution main in the street to the customer stop tap or meter, which is usually adjacent to the boundary between public and private land – which is owned by the water company.
- The customer supply pipe is defined as the pipe from the customer stop tap or meter, which is usually adjacent to the boundary between public and private land, to the wall of the house / property – which is owned by the customer.

DWI have supported our proposals. There will be a legal instrument through a Regulation 28 notice. The programme is a statutory obligation. An extract from *Appendix 5.3.B.3 – Confirmation of DWI support PR19 WSX Lead strategy* is included overleaf.

In section 3 of *Supporting document 5.3 – Providing excellent drinking water quality* we set out the options we have considered for the extent and pace of the lead pipe replacement programme, and demonstrate that an enhanced approach is in the best interests of customers. A 'do nothing' option is not feasible given that lead is a public health issue, that there is no safe limit for lead in drinking water and because we have a legal undertaking to carry out lead pipe replacement.

PERIODIC REVIEW 2019

SUMMARY OF DWI ASSESSMENT – LETTER OF SUPPORT

	Comment
Water company:	Wessex Water
DWI scheme reference(s):	WSX 3
Scheme name:	Lead Strategy – Lead
Proposal:	Provision of a package of measures to secure or facilitate compliance with the lead standard for drinking water quality reasons across the Wessex Water area.
Supporting evidence:	- Risk assessment reports for lead in the Wessex Water area submitted to the Inspectorate in-line with the requirements of Regulation 27 and 28. - Annex 3 - Lead Strategy - Regulation 28 Submission entitled 'high risk lead zones'
Conclusion:	Subject to the caveats listed below, the Inspectorate supports the need for the following scheme: - Aim of 9000 lead comms and supply pipe (up to the wall of the property)/5 yr (replacement following sample >7µg/l) - Where practical customer awareness will be raised (e.g. synergies with metering and leakage programme)
Timescale:	Completion date: ongoing throughout AMP7
Estimated cost:	£8-10 million (totex)
Legal Instrument Required:	Notice under Regulation 28 (4)
Caveats:	1. Continuation and continuous development of the Company's Lead Strategy in line with the Inspectorate's guidance. 2. Comply with regulations 18(1), 18(6), 18(11) and 30 with regards to lead; and in the case of public buildings (with reference to Regulation 19A), the requirements of S75 of the Water Industry Act 1991.
Comment:	DWI has no role in determining proportional allocation of expenditure. Where DWI technical support is given, this should not be taken by the company to imply that
	the scheme will be partially or wholly funded as a Quality item. Schemes that require a legal instrument are considered necessary to meet statutory drinking water quality requirements. These schemes will be transposed to formal programmes of work by DWI as soon as possible and their implementation and completion will be monitored, audited and closure confirmed by DWI.

3.3 Opex allowance

The opex allowance included in Table WS2 line 45 is for replacement of the customer supply pipe, which is not our asset. In accordance with Regulatory Accounting Guidelines (RAG) we allocate work on the customer supply pipes to opex.

We note that in the deep dive of Welsh Water's (WSH) proposals, who are proposing the same approach as us, all the costs (communication pipe and customer supply pipe) are allowed as capex and an enhanced unit rate is allowed for replacement of the communication pipe and customer supply pipe. In addition for WSH the unit rate is uplifted for the potential reduction in the lead standard citing the Water strategy for Wales and Welsh Government's wellbeing goals, but this also applies in England.

A brief comparison is as follows:

- WSH and HDD are allowed £2,000 per pipe using HDD's unit rate as a benchmark
- Costs are allowed as capex for communication pipe and customer supply pipe replacement
- Our all up rate for communication pipe and customer supply pipe replacement is £5.580m capex + £5.712m opex = £11.292m / 9,000 pipes = £1,255 per property.

Ofwat have disallowed all enhancement opex, on the basis that this cost is allowed for in the base service cost models. We have considered the potential for the IAP base cost allowances to include some implicit allowance for the enhancement opex relating to meeting lead standards. In the discussion below, we have taken the position that the enhancement expenditure in this category relates not just to meeting lead standards but also to an underlying desirable outcome: reductions in the risk to drinking water quality that arises from water being conveyed through lead pipes or through piping where lead is used (e.g. for soldering).

The following considerations seem relevant to form an understanding of the implicit allowance for enhancement opex, if any, for meeting lead standards:

1) The Drinking Water Inspectorate (DWI) recognises that one way in which water companies have sought to address the risk arising from lead pipe is by installing additional water treatment (phosphate dosing or pH dosing) but that this is a short-term solution and that the only permanent long-term solution is the removal of lead pipes and fittings, including the communication and supply pipes.[1] The DWI suggest that this will be particularly the case if a 5µg /l limit is adopted, in line with current iterations of revisions to the Drinking Water Directive.

2) The activity related to the replacement of lead pipes is not captured in any explanatory variables in the econometric models of base costs, nor is it strongly correlated with any of the cost drivers that are included in those models (other than scale in the sense that we generally expect the number of customers affected by lead pipes to be greater for companies who supply more customers).

[1] Drinking Water Inspectorate (2018) "Drinking Water 2017, Summary of the Chief Inspector's report for drinking water in England", page 19.

3) Where companies have taken steps to meet lead standards in the period 2011-18 through replacement of lead communication pipes owned by the company we would expect the costs of the pipe replacement to have been categorised as capital expenditure. These costs of lead communication pipe replacement do not seem relevant to the opex elements of the allowances derived from econometric models of base costs.

4) Where companies have taken steps to meet lead standards in the period 2011-2018 through replacement of lead supply pipes owned by customers, we would generally expect this expenditure to have been categorised as operating expenditure (as the water company does not own the asset). For many years we were the only company replacing customers' lead supply pipes without charge over the 2011-18 period, and if some companies have treated the costs as opex, there could be some implicit allowance for opex associated with lead pipe replacement in the IAP base cost allowances for the 2020-25 period – but it is likely to be very small. The allowance would be commensurate with the scale (or rate) of customer-side lead pipe replacement in the 2011-18 period (subject to point (5) below). The opex associated with customer-side lead pipe replacement is opex to achieve a long-term benefit, in terms of lead pipe risk reduction (e.g. the costs provide benefits over the life of the replacement pipe).

5) It appears that different companies take different approaches to the accounting treatment of expenditure incurred to replace customers' supply pipes. To the extent that some companies have reported historical customer-side pipe replacement costs as enhancement capital expenditure in the 2011-2018 period, this will have suppressed the implicit allowances under (4) above.

6) There is a further consideration relating to other ways, besides pipe replacement, that companies might seek to achieve or improve outcomes in relation to risks arising from lead pipes (e.g. methods involving water treatment through phosphate dosing or pH dosing). These alternative methods may involve some opex and so it seems plausible that there is some implicit allowance within the IAP base costs allowances that is associated with these alternative methods. These implicit allowances would relate to the opex for maintaining the level of lead pipe risk achieved in the 2011-2018 period. The benefits from this type of opex are short-term in the sense that the risk reduction they bring (compared to a counterfactual of no dosing) is only maintained on an annual basis if the dosing (and costs of that dosing) are also maintained over time. We have a twin track strategy of dosing in parallel with lead pipe replacement. In practice it is not possible to reduce the amount of dosing until one has very high confidence that all the lead pipes in an area are removed. This would take many years to prove, so it will be necessary to maintain the current level of dosing for at least 10 years. So the opex for maintaining dosing in the base cost allowances are required for that purpose.

7) The level of service and scope of works that we are proposing is significantly greater than delivered by the average company (and the UQ efficient companies). Historically we are the only company to have strived to replace lead customer supply

pipes as well as company communication pipes. Even for PR19 only a few companies are proposing to replace lead customer supply pipes, including companies in Wales (Welsh Water and Hafren Dyfdrey), United Utilities and a small trial in Southern Water' Deal zone.

8) The quantum of work being proposed is greater than delivered in the past by the average and UQ companies. The data included in the Ofwat model shows that the number of pipes we are proposing to remove is significantly more than other companies taking into account our size.

On the basis of these points (which we recognise may not be comprehensive), this suggests the following:

- It is difficult to see how the implicit allowance relating to lead pipe risk reduction from the IAP base cost allowances could cover the costs of customer-side lead pipe replacement where these costs are treated as opex, if a company's proposed rate of customer-side lead pipe replacement (and hence rate of risk reduction) is significantly greater than in the 2011-2018 period used for the base cost modelling – which it is.

- If one or more water companies have reported historical costs for customer-side lead pipe replacement as enhancement capex rather than opex, this will have suppressed the implicit allowances under the point above (which is excluded from the modelling of base costs).

- There may be some implicit allowance relating to the opex from mitigating lead-related risk through water treatment techniques (e.g. phosphate dosing, which costs circa £200k per year). But even if an increase in customer-side lead pipe replacement costs went hand-in-hand with a decrease in the use of these techniques, which is doesn't because there is a lag of up to five years, we do not see how these costs would cancel each other out. This is because pipe replacement provides a long-term solution. Phosphate dosing is essential in the short to medium term.

- Pipe replacement is the long term solution. Our rate of replacement is significantly greater in AMP7 than AMP6, as a step towards our long term target of removing all lead from the network.

3.4 Conclusions

Ofwat have disallowed all enhancement opex, on the basis that this cost is allowed for in the botex models. Depending on whether other companies have incurred opex costs for customer supply pipe replacement, it is possible to conceive that there is an implicit allowance for this work in the IAP base cost allowance, but it would seem that the implicit allowance is insignificant compared with the costs required.

We have proposed a progressive approach to reducing exposure to lead, which comprises replacement of lead communication pipes and customer supply pipes. The strategy has the support of the DWI and is a statutory obligation.

We allocate part of the total cost to opex in accordance with RAG guidelines. A key issue is whether other companies allocate part of the overall costs to opex, and whether the industry's historical costs include for the same scope of work. One option would be consider a totex unit cost model.

Our overall unit cost is efficient compared with others, and our options analysis, as agreed by the DWI, shows that the strategy is the best value for customers.

Therefore we would request that, on the basis of the additional evidence provided above, the deep dive and lead pipe unit cost assessment is reviewed and/or a totex unit cost model is adopted.