Wessex Water Services Ltd Response to Ofwat's PR19 Draft Determination – August 2019

Representation reference: **Cost Assessment C8**

Representation title: **WINEP: In-the-round 8.6% efficiency challenge**

Summary of issue

The draft determination cost assessment for the wastewater WINEP programme shows a £97m gap between our business plan proposals and Ofwat's modelled allowances post-efficiency. Our concerns about the individual models and deep dives are set out in the accompanying driver-specific representations.

In this document, we explain our concerns about the overall approach taken to modelling enhancement expenditure and the efficiency in the round challenge that Ofwat has introduced late in the price review process.

As pointed out in our IAP response (page 21-22) the models for each driver show a very wide range of costs, much wider than can be explained by the variations in efficiency between companies. We consider that too much weight is being placed on models that have substantial shortcomings.

The WINEP in-the-round upper quartile challenge is not sufficiently justified and is calculated incorrectly. We consider that Ofwat should review its approach by:

- Removing Hafren Dyfrdwy from any estimate of the Upper Quartile efficiency calculation for wastewater and from the cost models more generally, and
- In addition, removing Severn Trent Water from the estimate of upper quartile efficiency or includes the costs of the WINEP schemes that the company has decided not to include in its "baseline" plan, but has included a mechanism for funding through the revenue control if they are required

The main reasons are:

- Including Hafren Dyfrdwy (HDD) in the wastewater enhancement modelling is not credible. Their proposed WINEP expenditure is only £2.7m out of a total WINEP programme of £4.5 billion for 11 wastewater companies i.e. HDD represent 0.06% of the programme but 9% of the model observations. The modelling for HDD gives implausible results for the efficiency of its enhancement expenditure. Based on these untenable results, HDD is deemed an upper quartile company, which pollutes the results for other companies.
- Whereas most other companies have put all of their WINEP requirements (including all those that are unconfirmed) into their cost allowances, Severn Trent has not included all of these projects and has instead included a mechanism whereby if they are required, they are remunerated by an adjustment mechanism. It is our understanding that Severn Trent removed the comparatively less beneficial schemes that did not have multiple statutory drivers attached to them, while incorporating those that did into the plan, which we would assume means that the projects in its

plan would have comparatively lower costs on a unit cost basis. This is a perfectly reasonable approach to take and we imply no criticism of Severn Trent for it. However, it risks polluting the estimates of modelled costs for the industry more generally as companies would not be compared on a like-for-like basis. The problem is compounded in the draft determination by Severn Trent forming part of the upper quartile at the WINEP-wide level and thereby driving the efficiency challenge applied to other companies.

Change requested

We request that, in developing the final determination, Ofwat considers:

- Performing a wider review of the plausibility of its modelling results, including the magnitude of estimated coefficients and fit with engineering and economic logic before using results from these models to determine upper quartile adjustments
- The business case proposals as a check against the model results, in order to remove implausible findings about relative efficiency
- Revision of the programme-wide adjustment to remove Hafren Dyfrdwy, whose data skews the results.
- That we have some uncertainty about whether all companies' costs and explanatory factors have been presented on a like-for-like basis - in particular Severn Trent's WINEP, but this may apply to other companies. Given the current uncertainty here we request, in order of preference, that Ofwat:
    - Updates all models for Severn Trent's cost estimates for its full WINEP, or
    - Removes Severn Trent's costs from the calculation of the models,
      And that Ofwat:
    - Discounts Severn-Trent from the calculation of the upper quartile WINEP challenge if Ofwat continues to apply this.

Rationale (including any new evidence)

In this section we:

i) Provide general comments on the econometric modelling
ii) Discuss how inclusion of Hafren Dyfrdwy skews the results of the upper quartile challenge assessment
iii) Discuss potential issues with how Severn Trent's costs are modelled.

i) General comments on econometric modelling for enhancements

The models used at draft determination are mostly still the same unsatisfactory models that were used for the initial assessment of plans.

There are large differences between companies forecast costs and the benchmark costs. We consider that this is indicative of modelling error rather than efficiency.

The key shortcomings are:

- The small sample size for wastewater, which has implications for modelling error
- Use of totex as a dependent variable, with no consideration given to the difference in the nature of opex and capex expenditure
- Use of forecast data for costs
- Very limited intuitive (e.g. technical or engineering) grounding for the specification of the models or for the results implied by the models
- Models limited in the range of cost drivers that they take account of.

The efficiency challenge that is applied across the WINEP categories flows directly from the modelled allowances estimated from a set of models to which, to a large extent, the shortcomings listed above apply. We comment on specific aspects of the models in each of the relevant chapters. We are especially concerned that the large impact of the WINEP-efficiency challenge on the determination of allowances for a significant part of our investment plan is at odds with the quality of the econometric models upon which it is built.

ii) Programme-wide efficiency adjustment for WINEP-related enhancements

In the draft determinations, Ofwat applies a programme-wide WINEP efficiency adjustment, which is a departure from the approach adopted at the IAP. The mechanics of the adjustment are as follows:

1. For each company, Ofwat aggregates across all WINEP-related enhancement categories (a) the Business Plan totex (after any Ofwat reallocations), and (b) the modelled allowances that are derived from the separate cost assessments carried out for each different WINEP category.
2. Ofwat calculates the efficiency ratio across WINEP, by dividing (b) by (a), i.e. dividing aggregate modelled allowance by aggregate Business Plan totex.
3. Ofwat calculates an upper quartile efficiency ratio based on (2). It then applies this adjustment to the modelled allowances of those companies that are below the upper quartile. For companies above the upper quartile, Ofwat sets allowances equal to companies' Business Plan totex (after any Ofwat reallocations).

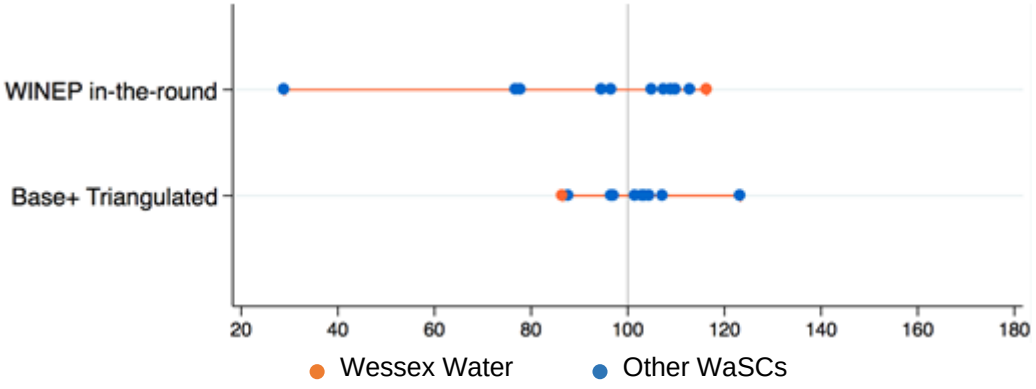
The calculations contain an error. Specifically, at (2), Ofwat should have divided (a) by (b) – Business Plan totex by modelled allowance – rather than the other way round. Making that correction would produce an efficiency adjustment of 0.863, rather than the 0.914 which Ofwat currently computes. The effects of such a correction are material: it would mean that, for all companies that are below the upper quartile efficiency ratio, the allowances covering the WINEP enhancements would be 86 per cent, rather than 91 per cent, of the modelled allowance produced from the set of Ofwat's cost assessment.

Apart from the computational mistake flagged above, and leaving aside the choice of efficiency benchmark (i.e. upper quartile or not), we consider that Ofwat's approach to having a WINEP-wide efficiency adjustment, rather than having adjustments done for each WINEP category separately as for IAP, is an improvement. This aspect of the approach at DD mitigates to some extent the risk associated with the degree of noise in the results of

each of the individual enhancement models. More specifically, the approach at IAP capped allowances at the modelled allowance, for each separate category, which, given the noise in models, increases the risk of allowances being unduly capped as a consequence of modelling error rather than relative efficiency. Aggregating allowances across WINEP categories, and applying efficiency adjustment and capping only at that aggregate level, helps mitigate that risk: aggregation across models helps even out the noise overall to some degree.

Whilst it might mitigate matters to some extent, aggregation across WINEP categories does not resolve the problems of the modelling error and noise from individual models. Figure 1-1 below shows the spread of efficiency scores for the WINEP categories in aggregate. For comparison, it also shows the spread for the triangulated wastewater Base+ models.

Figure 1-1: Spread of efficiency scores for wastewater under Ofwat Draft Determination



We see that the spread of results across companies is wider from the WINEP in-the-round assessment than the triangulated base+ modelling. This is, at the least, indicative of greater modelling limitations in the former.

Table 1-1 below considers the gap between our business plan proposed totex and the DD allowances and provides a breakdown of the part of the gap, which is due to the category-level modelling and that which is due to the programme-wide upper-quartile adjustment. We have performed our calculations after correcting for the error described above in how Ofwat derives the upper quartile efficiency challenge. We note that the two adjustments are a similar order of magnitude.

Table 1-1: Breakdown of gap between requested and allowed totex for WINEP

Element	
Totex business plan, after reallocation	£451.5 million
Gap to modelled allowance	– £63.5 million
Upper-quartile efficiency adjustment (using correct calculation)	– £53.3 million
Totex allowed	**£334.7 million**

In this context, we have gone on to look at:

- Which companies, within the WINEP categories, form the set of upper quartile companies and therefore define the upper-quartile efficiency adjustment?

- What is the "source" of such upper-quartile efficiency, i.e. which are the enhancement categories that are contributing to those companies being, in the aggregate, in the upper quartile?

The answer to the first question is that across the WINEP categories, the upper quartile companies are Hafren Dyfrdwy Water, South West Water and Severn Trent (England), the top three companies shown in Table 2. The table reports the relative efficiency ratio of each company, defined as Business Plan totex (after reallocation) divided by modelled allowance.

Table 2: WINEP-wide efficiency ratio (Business Plan totex divided by modelled allowance)

Company	Efficiency Ratio
Hafren Dyfrdwy Water	29%
South West Water	77%
Severn Trent (England)	78%
United Utilities	95%
Welsh Water	97%
Southern Water	105%
Anglian Water	107%
Yorkshire Water	109%
Northumbrian Water	110%
Thames Water	113%
Wessex Water	116%

The set of figures reported in the table above are based on the data reported in the worksheet "WINEP-in-the-round" of the file "FM_E_aggregator_ST_DD.xlsx" published by Ofwat at draft determination. We have, however, corrected one calculation mistake which concerns the derivation of modelled allowance for Hafren Dyfrdwy Water in relation to FFT enhancements. The mistake has a small impact.[1]

Figures 2 – 5 below provide a representation of the 'source' of the relative efficiency of each of the three companies that at the WINEP-aggregate level are in the upper quartile. In particular, taking each of those companies in turn, the figures show the difference in £ million between the company's Business Plan totex (after Ofwat reallocation) and the allowance modelled derived from Ofwat's cost assessment analysis, across the set of enhancement categories. A negative number indicates that, for that enhancement category, the relevant company's Business Plan totex was below the modelled allowance derived by Ofwat's analysis. For further comparison, we also include a chart for Wessex Water.

[1] The error lies in the file "FM_E_WWW_flow-to-full-treatment_ST_DD.xlsx", containing Ofwat's cost assessment of that enhancement category. Cells L15 and L16 of the worksheet "Analysis" in that file are blank. Those cells should have reported the number of schemes and the FFT shortage for HDD, which would have then been applied to the estimated coefficients from Model 2 to derive the modelled allowance for HDD under that model. Because they are blank, the calculations done in the Excel file are as if the number of schemes and the FFT shortage for that company are zero, and the modelled allowance reflects that. Correcting for this leads to a slight increase in HDD's modelled allowance from £6.5 million to £6.8 million, and to a consequent improvement in its relative efficiency, from 30 per cent to 29 per cent (shown in the table).

Figure 1-2: Hafren Dyfrdwy Water: difference between BP totex and modelled allowance (£m)[2]

Figure 1-2: South West Water: difference between BP totex and modelled allowance (£m)

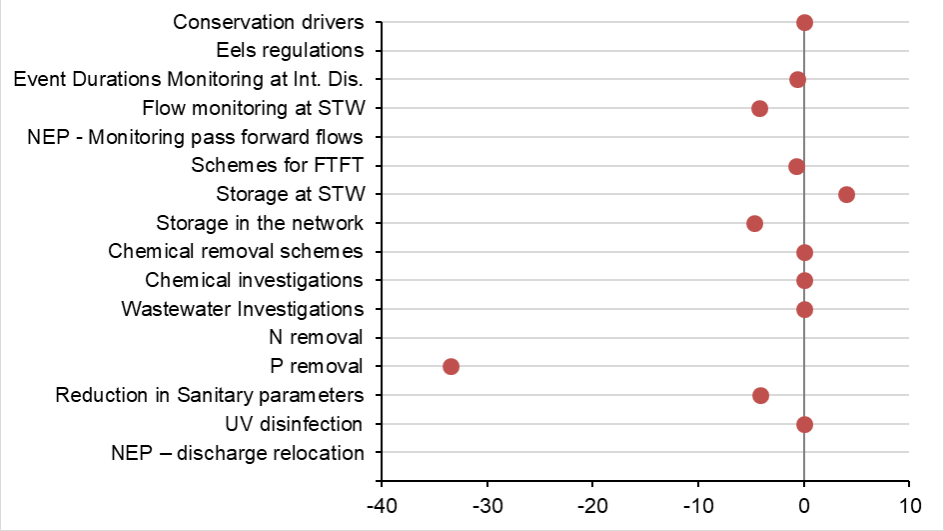
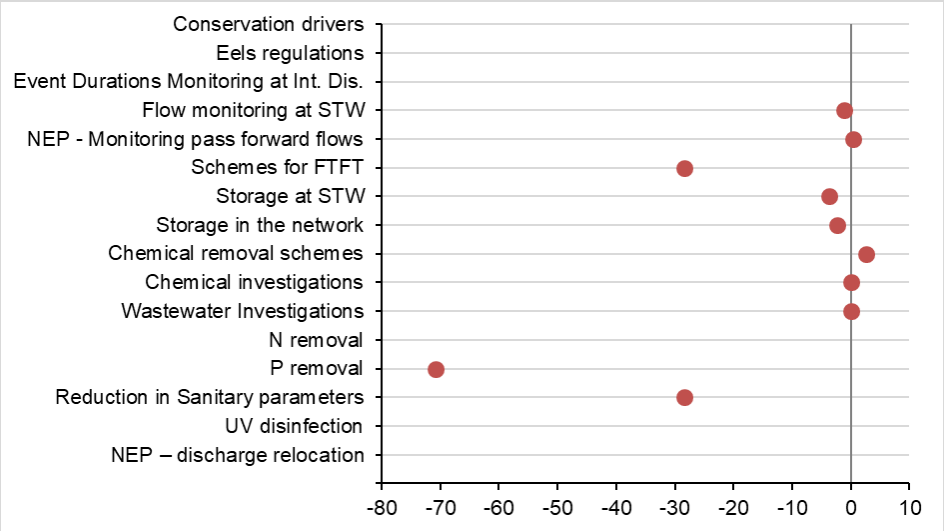
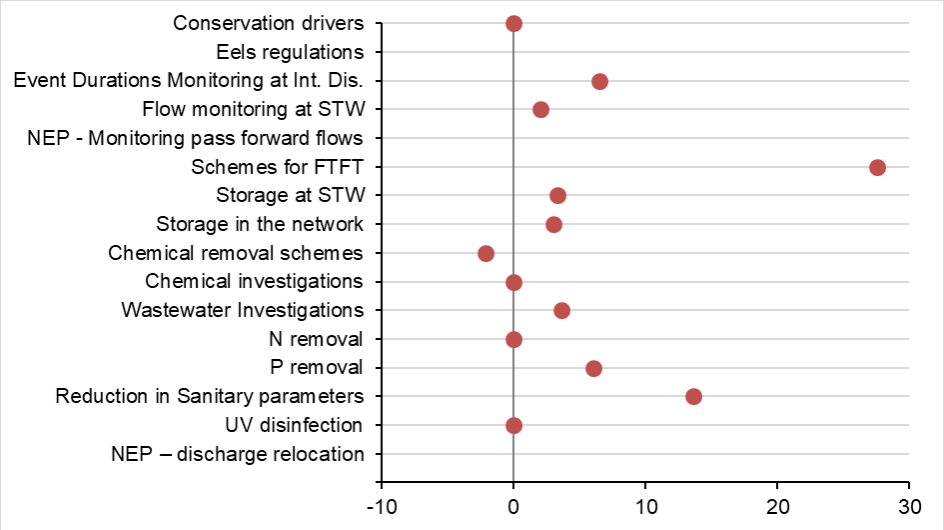


Figure 1-3: Severn Trent (England): difference between BP totex and modelled allowance (£m)



[2] Chart reflects correction to modelled allowance for FFT enhancements, as discussed earlier in note.

Figure 1-4: Wessex Water: difference between BP totex and modelled allowance (£m)



Based on this analysis we conclude that **Hafren Dyfrdwy Water should be excluded from the set of companies used to determine upper quartile adjustment.**

The reasons are:

1. There should be a general concern about the appropriateness of benchmarking the other 10 wastewater companies with one that is 50 to 290 times smaller (in terms of planned WINEP totex).

2. Secondly, and potentially related to the first point, the efficiency ratio for Hafren Dyfrdwy Water is 29 per cent. That is to say, Ofwat's cost assessment econometric modelling predicts that that company's totex for WINEP enhancements are over three times what the company itself put forward in its business plan. The extent of this discrepancy raises major questions on the robustness of Ofwat's benchmarking assessments and on the applicability of such assessment to the case of HDD.

3. The source of HDD's outstanding relative efficiency in its business plan, as assessed by Ofwat, is almost entirely driven by that company's performance in Ofwat's cost assessment of enhancements relating one driver - FTFT. It is not reasonable or credible that HDD's relative performance on one enhancement category should carry such weight in setting the upper quartile adjustment that is then applied across all companies' WINEP enhancement expenditure.

4. The previous point is exacerbated by noting the very wide gap in the modelled allowances for HDD produced by the two models that Ofwat did develop for assessing FTFT enhancements. The modelled allowance of £6.8 million put forward by Ofwat is the average of the £9.9 million produced by one of its models, and of £3.7 million produced by the second of its models.[3] Such width of predicted allowances gives little

[3] These figures are based on correcting the error regarding the treatment of HDD in these models, which we described earlier.

confidence about Ofwat's modelling; there is clearly a lot of modelling error or noise around either estimate. Further, we note that for one of the FTFT models Ofwat included the observation on HDD that the model "was not producing reliable results for this company."[4] However regardless of this observation, Ofwat then used the estimated coefficients from that model to produce modelled allowances for HDD. This does little to bring confidence to the modelled allowances produced for HDD in this enhancement category.

iii) Modelling of Severn Trent's WINEP costs

In our business plan, we have costed all items classified as green (high certainty) or amber (medium certainty) in the WINEP. We developed an uncertainty mechanism to protect customers in the case that schemes are removed from the WINEP during PR19.

We note the different approaches by a few companies regarding amber schemes in the WINEP, including Severn Trent, who excluded "less certain amber projects"

It can be inferred that Severn Trent has removed its comparatively less cost beneficial schemes that had more stringent permits or did not have multiple statutory drivers attached to them, while incorporating the more cost beneficial schemes into their plans. We assume this means that the projects included in its plan have comparatively lower costs on a per unit basis. This is a perfectly reasonable approach to take, however it risks polluting the estimates of modelled costs for the industry more generally: the approach skews the mix of projects that are benchmarked with those of the remaining companies. In our business plan submission in September 2018 (Supporting document 5.1 – Protecting and enhancing the environment) we explained the step change in costs when targeting more stringent permits, and this was accepted by Ofwat including stringency of permit in its updated phosphorus removal model for draft determination. We also explained our approach to seeking synergies when schemes had multiple drivers. A more detailed review of our understanding of Severn Trent's approach can be found in Representation C3: WINEP: Phosphorus Removal. The impact of this issue is compounded in the draft determination by Severn Trent being identified as within the efficient upper quartile and so determinant in defining the WINEP-wide efficiency challenge.

Our solution to this would be, in order of preference:

- Update all models for Severn Trent's cost estimates for its full WINEP
- Remove Severn Trent's costs from the calculation of the relevant models
- Discount Severn Trent from the calculation of the upper quartile WINEP challenge if Ofwat continues to apply this.

[4] Ofwat (2019) File "FM_E_WWW_flow-to-full-treatment_ST_DD.xlsx", worksheet "Analysis", cell V4.

Why the change is in customers' interests

Having appropriate cost allowances to deliver the WINEP enhancements will allow us to deliver the environmental improvements required by the government. The proposed costs were allowed for in our plan which received very high scores with regard to overall acceptability with customers.

Links to relevant evidence already provided or elsewhere in the representation document

Already provided

- Response to IAP summary document (April 2019)
    - Appendix 4 Protecting and enhancing the environment: Response to IAP

New

- Response to draft determination (August 2019)
  Other representations including:
    - Representation C3: WINEP: Phosphorus removal
    - Representation C4: WINEP: Sanitary parameters
    - Representation C5: WINEP: Flow to full treatment (FFT) increase
    - Representation C6: WINEP: Investigations
    - Representation C7: WINEP: Event duration monitoring