South Staffs Water

incorporating

CAMBRIDGE WATER COMPANY

Response to Ofwat Cost Modelling Consultation

4 May 2018

Introduction

We are supportive of Ofwat's decision to consult on cost modelling. We believe it is helpful for Ofwat to gather knowledge from the industry, over and above the cost assessment working group engagements, to strengthen the cost modelling process for PR19. We recognise that Ofwat will not be able to reveal final models and appreciate the opportunity to provide feedback on the suitability of the models developed by Ofwat and companies.

We think that it is helpful that there has been a broad range of models submitted by companies and by Ofwat, using a wide range of cost drivers and specifications. Whilst some specific models have issues, which we provide our views on in this response, the majority of models in their many combinations could be informative of the industry-wide cost differentials, and no one model is outrightly superior to any other, given uncertainty expected in a cost modelling process. We would therefore be strongly supportive of triangulation across a broad range of models and other evidence rather than focussing on a limited model set to ensure that no undue reliance is placed on any specific set of cost drivers or assumptions underpinning certain models.

Our response focuses on two main themes:

- Our views on the suitability of the published models for industry cost modelling, split into wholesale and retail; and
- Our views on TOTEX and enhancement.

Suitability of published cost models - wholesale

We have not examined all of the models provided by Ofwat or submitted by companies in detail due to time and resource constraints. We have a few main areas that cover a selection of the models, and have specific comments on certain models.

Water resources models

We have identified that in general the water resources models perform less well than network plus or BOTEX models (in terms of the estimated range of residuals). This is most likely because water resources is a relatively small price control compared to network plus, and likely to be more sensitive to cost allocation differences between companies at the margins. Because of this we think that it would be inappropriate to set the water resources price control on the basis of a water resource model alone, and that a wider set of information should be taken into account, including examining a top down allocation between water resources and network plus, as well as information from wholesale BOTEX modelling.

However we think that broadly speaking the majority of models submitted for water resources are reasonable and would be appropriate to use in a triangulated approach as a sense check to a top down allocation approach.

Ofwat's and Anglian Water's water resource models perform well and we can support all but one of the models with a green rating on the RAG assessment. The one model of Anglian's that we don't support uses the threshold sensitive density/sparcity variable that we have concerns with (discussed later), therefore we rated this model as red on the RAG assessment.

The models we submitted are very similar to those submitted by Yorkshire Water and Southern Water, containing similar combinations of cost drivers and performing similarly on

the statistical tests. We can be broadly supportive of these models being used in a triangulation and have rated them as green.

Power costs

We think it would be helpful to set out our view on how power costs are accounted for within the cost modelling process. Firstly, the industry average level of power costs is broadly allowed for through the main scale driver, whether that is connected properties, length of main, or distribution input. Secondly, the variance between companies pumping power costs due to topography, which is outside of company control, would be allowed for by an average pumping head (APH) driver. All models therefore allow for power costs to a large extent, however those models which include an appropriate APH cost driver should, in theory, better represent power cost differences between companies.

The APH cost driver is now reported separately for all four business units within water wholesale. Critically, it became apparent during the 2017 cost assessment data collection exercise that some companies were struggling with providing robust data in this area, and it is unclear the extent of consistency in reporting particularly in those business units where it is more difficult to measure APH and therefore assumptions are being used. We think that APH has different degrees of validity in the different business units, and that this needs to be strongly taken into account when it is used as a cost driver in the value chain models. There is also a potential circularity issue – APH is used by companies to proportionally allocate power costs to the four business units as per the regulatory accounting guidance. Therefore if there are issues with calculation of APH, there will also be issues with the proportional allocation of power costs. The table below sets out our rationale for the validity of APH for each business unit.

Business unit	**Comments on the engineering logic of average pumping head**
Water resources	This business unit is primarily concerned with abstracting water, from either the ground via boreholes/wells or from surface water storage via reservoirs and rivers. APH is a good cost driver here because companies do have a different mix of groundwater, surface water, gravity reservoirs and river abstractions. This mix of assets, along with the ground water level of boreholes, will dictate the amount of pumping and therefore the power costs that each company requires in this business unit. There are limited other power costs incurred in this business unit which means that the scale driver, APH variable and geological factors such as number of sources should account for the vast majority of costs.
Raw water transport	This business unit is concerned with the transport of raw water from the point of abstraction to the start of the treatment process. For sites where abstraction and treatment are co-located, there is zero raw water transport. APH is a good cost driver here also. Companies that have abstraction located remotely from treatment may need to incur more pumping costs to transport that raw water from A to B. The correct calculation of the APH value will ensure that the mix of gravity and pumped feed will be properly accounted for. There should be limited other power costs incurred in this business unit which means that the scale driver and APH variable should account for the vast majority of costs.

Water treatment	This business unit is concerned with the treatment of raw water to potable standard. APH is a very poor cost driver in this situation and cannot reflect the power costs of operating treatment assets. The costs associated with treatment go far beyond just pumping, and the APH metric itself cannot sufficiently and robustly capture all pumping costs within this business unit. Assets such as rotating screens, mixers, air compressors and chemical make up systems are all used extensively throughout treatment assets. Furthermore, assets such as UV treatment have a direct and high power consumption yet are not pumps, so do not contribute to the APH value. Treatment systems do include large pumps which push the raw water through the process, which contribute to APH, however they also include a multitude of smaller pumps that are not practical to include within the calculated metric. Examples are chemical dosing pumps, chemical transfer pumps, backwash pumps, recycling and circulation pumps. These are all necessary for correct operation of the treatment process. We think there are better cost drivers to describe treatment costs, for example the treatment complexity variables that have been used (although these can be threshold sensitive and hence different cut-off points must be explored), or the mix of surface and ground water at a high level could also work.
Treated water distribution	This business unit is concerned with the supply of water from the end of the treatment process to customers, including re-pumping occurring within the distribution system. APH is an appropriate driver here, because the majority of power costs are incurred from plants pumping into or within the distribution system. The extent of power costs correlates with the topography of the region which is outside of company control.

Our view is that the models which make use of APH(treatment) are not robust. For this reason we have allocated a RAG status of red to Ofwat's water treatment and water resource plus models which all use this cost driver.

Ofwat has also used the APH(treatment) in its network plus models, and APH(resources+treatment) in its wholesale water models. This is inappropriate as this cost driver does not represent power costs for treatment very well, as noted above, but it also has no bearing on the much larger distribution pumping power costs within treated water distribution that are heavily dependant on topography and which make up the majority allocation of power costs for companies. For this reason we have also graded these models as red in the RAG assessment.

Wessex Water has submitted water treatment plus models which use APH however it is not specified which APH value is used. We assume, as this is water resources and water treatment combined, that this is APH(resources+treatment), and therefore these models are also not robust and we have rated them as red in the RAG assessment.

We therefore think that there is a place for APH(resources) and APH(distribution) as cost drivers in models, but recognise that these may not show as statistically significant, particularly in the business unit BOTEX models where the cost driver could be small relative to the overall price control. We experienced this difficulty ourselves when working with Oxera in developing models for the consultation. We would expect the cost driver to be more significant when looking at the disaggregated water resources or treated water distribution

business units where cost scope is a little smaller and the relevant APH value can be shown to have a more direct influence. This logic appears to be borne out by the treated water distribution models that Thames Water submitted where APH(distribution) is shown to be significant. We can support these Thames models on this basis and as they appear to be broadly strong across the cost drivers used.

Density and sparsity

Ofwat has developed bespoke density and sparsity cost drivers by using LSOA population data and mapping this to company areas. This approach works to create a distribution, however there is an issue with how a threshold is selected for density and sparsity considered in the modelling. At the moment, Ofwat has created three levels for density and three levels for sparsity, however there is no rationale for how these have been selected and there is no evidence to suggest these thresholds do indeed represent points at which companies costs change. For this reason we have concerns about models which have made use of these cost drivers and have marked these models as red within the RAG assessment.

A number of models in the consultation contain a density variable but do not explain how this is calculated. We would need to know this detail in order to form a judgement on these models, and so these have been left ungraded in the RAG assessment.

Our general view is that models which use linear density variables (such as properties over area, properties over mains) are more transparent as they don't require thresholds to be pre-selected.

Maintenance drivers

Overall we are supportive of maintenance cost drivers within the modelling provided the usage is robust and represents costs which are sufficiently significant to warrant the use of a cost driver. We think that some of the models using maintenance drivers have met this criteria but others have not.

<u>Network maintenance activity</u>

There appear to be two main drivers that have been used in this area, network age (for example the proportion of mains laid after 1981), and maintenance activity (for example the proportion of mains refurbished or relined).

Network maintenance activity is a significant cost which has a direct relationship to aspects of service performance that customers care about, such as bursts and supply interruptions. We think it is right to include this in models, and the maintenance activity cost driver would provide a direct means of doing so, and so we support this. We also submitted models that used this approach.

There is some complication as whilst we support the use of network maintenance drivers (which we also used, hence we have marked our network plus and wholesale water models as green in the RAG assessment), in other models these have been used alongside other less robust drivers, discussion of these continues below.

<u>Service reservoir, water towers and booster station density</u>

A number of models make use of cost drivers which measure the relative density of service reservoir and booster station assets, normalised for mains length. We have reservations as to the appropriateness of these cost drivers as whilst the number of these assets would be accounted for, the relative size would not be, in its current form.

We also noticed that Wessex Water's treated water distribution models over rely on the service reservoir density cost driver, which we think is a significant over simplification of costs in this area, and therefore we have marked these as red in the RAG assessment.

Ofwat's models make use of network maintenance drivers which we support, but also use the asset density drivers, therefore we have marked these models as amber in the RAG assessment.

Water treatment complexity

There is merit in a cost driver which measures water treatment complexity using the 1-6 grading for surface and ground water treatment works. It follows that the mix of ground/surface water and the complexity of treatment could both have a bearing on costs. Within the 1-6 grading categories for treatment complexity, we feel that there is a justifiable threshold at level 4, where higher opex treatment processes become utilised.

We note in particular that Southern Water has created a set of network plus that appear to be very well constructed and are similar to the models we submitted. The models include some asset maintenance drivers (see previous page for our views) and the logical level 4 threshold for treatment complexity, as well as having the overall benefit of fewer cost drivers compared to some models thus maintaining simplicity. For these reasons we have graded these models as green on the RAG assessment.

Overall model complexity

We note that several models within network plus, for example Severn Trent and Anglian Water's models and to a lesser extent Bristol, South West, Welsh and South East's models, are significantly more complex making use of square terms, composite terms and year dummy variables to varying degrees. There are also some models within wholesale water that make use of squared terms and year dummies to a slightly lesser extent. Bristol also used year dummies in its water resource models.

We have chosen not to grade these models within the RAG assessment as we are not in position to judge their robustness. We think that these models, if robust, are potentially useful but perhaps more sensibly used as part of a triangulation with simpler models that are easier to understand. It is possible there is a happy medium where some squared terms, for example relating to density where there is a potential logic to this usage, may be appropriate if they improve the model's usefulness and do not materially damage its interpretability.

Suitability of published cost models - retail

We have not examined all of the retail models provided by Ofwat or submitted by companies in detail due to time and resource constraints. We have a few main areas covering a selection of the models, and make comments on certain models.

Extent of historic cost data used

Retail costs are fundamentally different to wholesale costs, which are primarily concerned with operating and maintaining a long life asset infrastructure. Retail is a more customer driven, improving process, responding to faster changing customer demands and technology, and with no long life embedded asset base to maintain. We think that creating models which draw on cost data from AMP5 are not robust because of step changes which occurred at PR14 in the allowed costs and where companies such as ourselves have delivered considerable efficiencies. We would advocate models which draw only on data since 2015/16. This would ensure that comparative efficient costs are using the most recent data available, reflecting current state of customer preferences and technology.

Deprivation cost drivers

Firstly, we note that unfortunately some of the models presented by companies are not clear in the templates what deprivation measure is used, and this limits our observations.

We believe that the income deprivation cost driver, which is a subset of the wider index of multiple deprivation (IMD), is a more direct cost driver for debt. The IMD contains the following seven domains of deprivation:

- Income deprivation (22.5%)
- Employment deprivation (22.5%)
- Education, skills and training deprivation (13.5%)
- Health deprivation and disability (13.5%)
- Crime (9.3%)
- Barriers to housing and services (9.3%)
- Living environment deprivation (9.3%)

While aggregate deprivation measures have certain limitations, we consider that income deprivation is directly correlated with the other themes and a more direct driver of debt costs. We therefore think that income deprivation is a sufficient catch all for all types of financial deprivation that would correlate to household debt and thus to water debt. We have marked models which explicitly use income deprivation as green in the RAG assessment.

Some companies have considered alternate drivers of deprivation, for example the proportion of companies in social housing, proportion of private renters, property repossessions, amongst others. Unfortunately information on these measures have not been made available and we have not been able to verify their construction or their interpretability.

Given the difficulties in selecting robust and appropriate cost drivers for deprivation, we would still support validating any econometric modelling with alternative approaches including an efficient cost to serve approach for the customer service costs and a separate deprivation model for bad debt and debt collection costs for WOCs.

Bill size cost drivers
In developing the models we submitted, with Oxera, we identified that there is a potential conflict arising for SSC in the modelling due to a combination of high deprivation levels, comparable to the worst WASCs, but being offset in the models by low bill level. This combination is unique to us.

The models developed by us and other companies fundamentally assume that a low bill level improves the debt position, and that high deprivation worsens the debt position, however given no WASC has as low a bill as us, and that no WOC has as bad deprivation as us, then we are observing that these models cannot represent our position appropriately.

We noted Severn Trent's approach to normalising the bill level for income, which we support as it could negate the above issue. We have marked this model as green in the RAG assessment as we think this approach has merit and can be developed further. A large number of models use the absolute (not normalised) bill size as a cost driver, we did not think it appropriate to grade these models in the RAG assessment on this basis alone and so we have left the majority of them blank.

Traffic speed in Wessex/Bristol models
We do not agree with this cost driver, and have therefore graded these models as red in the RAG assessment. The meter reading costs may be affected by traffic however this is only one small element of the retail cost and we would expect this to be a marginal cost impact given that optimisation of metering routes could significantly negate the issue.

SIM as cost driver in Anglian models
Anglian Water has used SIM as a cost driver in two of its models. We do not see any rationale for how this is relevant, given how close companies are bunched in the SIM scoring at the present time. This cost driver could also be double counting a financial incentive, as SIM performance is already rewarded/penalised through the ODI mechanism. We have rated these models as red in the RAG assessment.

TOTEX and enhancement

When we attempted to develop our own TOTEX or enhancement models we found it difficult to obtain robust results. Primarily we believe this is because of the variability in enhancement expenditure across companies and the difficulty in identifying cost drivers which can explain the costs, particularly for those areas of diverse expenditure such as environmental, water quality and resilience improvement. Additionally for smaller companies at least, some areas of enhancement have lumpy timing and the past is not necessarily a good indicator of anticipated programmes.

We thought it would be helpful for us to set out the areas of enhancement expenditure that will feature in our business plan for the next price control period, and provide our views on how these can be included in the cost allowances.

Overall, we are supportive of a BOTEX econometric approach with enhancement costs assessed in themes. In our view this would seek to model efficient BOTEX using econometric models and then layer on enhancement costs either on a unit rate basis where this is appropriate, or using a judgement based on companies' plans for those enhancement costs which cannot be modelled using a unit rate.

The following table sets out the themes of enhancement that are likely to feature in our business plan and our views on how cost allowances could be made.

Enhancement expenditure theme	**Our views**
<u>New development costs</u> These are the costs of connecting properties on new developments, which are partially funded through developer contributions. They consist of: • Cost of connection • Cost of new mains • Asset payments for self lay • Network reinforcement	Ofwat has proposed models for assessing new development costs however neither model has sufficient cost drivers to fully explain the costs in this area. For new development costs the cost drivers do not take account of type of connection, and extent of new mains and reinforcement. We would support an efficient unit rate approach by type of connection, which companies will be providing information on in their business plans (table App28).
<u>New metering costs</u> These are the costs of installing new meters at residential and business properties. They include: • Meter optants • Selective or compulsory metering	We would support an efficient unit rate approach linked to activity forecasts made in the WRMP. The business plan and tables will contain metering forecasts and costs, which would be sufficient data to develop a standalone efficient unit rate model, easily scaled per company to provide cost allowance for the forecast volume.

Lead replacement costs These are the costs of lead removal programmes. They could include: • Replacing lead communication pipes • Replacing lead supply pipes, even though these aren't water company assets • Assisting customers with internal lead replacement • Measures to control lead, such as orthophosphoric acid dosing	Ofwat has proposed models for assessing lead costs however these models do not have sufficient cost drivers to fully explain the costs in this area. The cost drivers do not take account of the complexity of different types of lead replacement. A unit rate approach may be suitable for routine lead CP and supply pipe replacement, however our future programmes may go beyond that in order to meet DWI's expectations of lead risk removal. As we start helping customers with internal removal, costs become more uncertain, especially as we intend to focus more on higher risk areas such as schools or care homes, where there is a higher population density and therefore greater benefit of intervention, but more cost involved per property. We would advocate a more judgement based view of efficient costs against the specific proposals we make in our plans, rather than attempting to model these costs.
WINEP These are the costs associated with delivering environmental obligations. For a water only company they include: • Meeting the water framework directive • Protecting groundwater sources • Actions to reduce over abstraction on sensitive groundwaters • Biodiversity outcomes, including protecting special sites such as SSSI's	Whilst all companies have to comply with the same WINEP outcomes, the individual requirements vary considerably between companies given their specific geographical and environmental challenges. In it's PR19 final methodology, Ofwat has implied an approach, as we understand it, where certain costs are funded and uncertain costs are subject to a unit cost adjustment mechanism. Our expectation therefore, is that we will set out the detail of our environmental programme in our business plan along with assurance of the costs we require and that they are efficient, and the details of our true up mechanism for uncertain projects; which would all then be subject to Ofwat's judgement on a cost allowance rather than a modelled cost allowance.

<u>Supply demand balance (excluding metering)</u> We covered metering above. These are costs associated with delivering the supply demand balance we set out in our Water Resources Management Plan, which include: • Meeting our leakage target • Water efficiency • Supply side increases	Historically all companies have these costs, and at PR14 Ofwat used a deficit cost driver to describe the supply demand balance expenditure in TOTEX bottom up models. However this driver does not capture costs very well, as companies with no deficit still have this activity, and the range of activity is broad. It is likely that there will be a step change in AMP7 to meet the leakage expectations, which have also gained strong customer and stakeholder support. It is therefore important that there is a process for capturing these costs in the modelled allowance as they will not be reflected in history; at present the methodology for this is not clear.
<u>Quality and resilience enhancement</u> All companies have historically had quality and resilience enhancement, to meet new standards or to address changing inputs, for example deteriorating raw water quality. Often this investment has DWI support. Some of our regular projects include: • New nitrate removal treatment to address rising nitrate levels. • Treatment to address other emerging groundwater issues such as metaldehyde or chlorthal. • Treatment to meet tighter risk standards on disinfection. • Protecting assets against flood risk.	We could not identify cost drivers which can describe the broad range of quality and resilience enhancement projects. Every scheme is different and unique engineering circumstances across companies' assets can mean costs of delivery vary significantly. At PR14, Ofwat used an unmodelled allowance in its unit cost modelling stream to allow for these types of costs that could not be modelled, as well as these costs being implicit within Ofwat's top down TOTEX models. However this approach is simply allowing every company an industry average level of cost, not specific to its plans or requirements. We would advocate a more company specific approach based on a company's proposals and the assurance it provides on the schemes it needs, the costs and efficiency, and how it will protect customers against under delivery against outcomes. If the company approach is a material step change, particularly for smaller companies where this type of expenditure can be lumpy in its timing, then this may be best dealt with through a cost adjustment claim.