Appendix 10 – Accommodating growth and new development: 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 wastewater network+ growth for the following drivers:

- Growth at sewage treatment works
- New development
- First time sewerage.

The table below summarises the additional evidence provided, our response to the cost assessment in the initial assessment of plans (IAP) received in January 2019, and the actions that we suggest Ofwat take prior to the draft determination.

Ofwat model / Driver	Value challenged £m	Our response	Suggested actions for Ofwat
Table WWn8 Line 7 (also in Table WWS2 Line 26) • Cost adjustment claim for STW capacity programme. Capex	19.2	Additional evidence regarding the validity of our cost adjustment claim and why this has not been accounted for within the baseline model for growth, i.e. the model does not reflect our unique position.	Review the drivers for the implicit allowance growth model and reassess the cost adjustment claim for STW growth based on the further evidence.
Table WWS2 Line 73 • Growth at sewage treatment works (excluding sludge treatment). Opex	1.4	Refer to our main document, *Our Response to Ofwat's Initial Assessment of Plans* – section 3.3.3	
Table WWS2 Lines 25 • New development and growth (Wastewater network supply demand balance). Capex	12.8	We have provided additional evidence of our bottom up approach to assessing the need for investment.	Use our bottom up approach and allow capex costs submitted
Table WWS2 Line 72 • New development and growth. Opex	3.6	Refer to our main document, *Our Response to Ofwat's Initial Assessment of Plans* – section 3.3.3	
Table WWS2 Line 1 • First time sewerage (FTS)	1.5	We have a duty to provide first time sewerage. We have seen a recent uplift in FTS applications. A large newly appraised scheme is likely to be viable.	Note that we may need to increase the forecast number of connectable properties at draft determination stage
Total capex	33.5		
Total opex	5.0		

Contents

1 Introduction

This document provides our response to Ofwat's initial assessment of plans (IAP) published on 31 January 2019 with respect to *Supporting document 5.7 – Accommodating growth and new development* and *appendix 8.6.A – Claim WSX02 – Sewage treatment works capacity programme* submitted in September 2018.

In this document we provide additional evidence and responses in relation to:

1. Sewerage treatment works capacity enhancement
2. New development growth (sewerage)
3. First time sewerage

Ofwat have chosen to group the investment in these first two areas with reduction in flood risk to properties, into a single model and then allocate the allowance to each area pro-rata with capex. The modelling for first time sewerage was undertaken separately.

In section 2 we set out our concerns about Ofwat's approach to the modelling and the inclusion of flood risk to properties within the growth model.

In the subsequent sections we provide further evidence to support the investment proposals in our plan for each of the three areas listed above, as per the outline of our Business Plan submission. Our response to the IAP with respect to flood risk to properties is addressed separately in Appendix 7.

2 Ofwat's growth models

We have concerns over Ofwat's approach to assessing the relative efficiency of growth expenditure given the significant magnitudes involved and the potential for inequitable results. We also have significant reservations about the different results of the models used. We outline our concerns in the following sub-sections. There are also inherent errors within the data used within the modelling, with misallocations of capex (by primary driver rather than proportional allocation) by Yorkshire Water (this is detailed in section 3.3.4).

2.1 Grouping of activities within the wastewater growth model

We consider that grouping all "growth" expenditure is inappropriate as the drivers for treatment and network growth expenditure are significantly different. Although network catchments are connected to a single STW, their available headroom is not related on a catchment level, nor are the magnitude of costs for capacity enhancement.

The set of activities included within the growth model (or even, the set of services provided) whose costs are being compared in their aggregate across companies are unlikely to be that homogenous and therefore comparable. There are differences across companies in the share of the capex that Ofwat models, that comes from each of the three different business plan lines: new connections, expanding STW capacity and dealing with sewer flooding risk. For example, for Wessex Water and United Utilities, the latter represents 45-50 per-cent of capex, whilst for Anglian and Thames it is 10 -15 per cent.

We consider that the sewer flooding expenditure should be separated out into a single model, as discussed further within section 2 of our IAP Appendix 7 – *Minimising sewer flooding*. Sewer flooding expenditure is driven by:

- hydraulic flooding
  - o whilst this can be driven by growth the elements of sewer flooding associated with this is covered in the "New Development and Growth" expenditure (line 25 in WWS2)
  - o hydraulic flooding associated with legacy assets, urban creep and climate change are included within lines 30 and 77 of WWS2
- sewer misuse, which is the cause of 80% of flooding incidents
- groundwater inundation
- increase in service levels for a reduction in sewer flooding risk, driven by the implementation of the statutory drainage and wastewater plans (DWMP).

The different drivers which trigger investment decisions for the three areas within Ofwat's growth model are summarised in Table 2-1 below. This highlights that none of the investments have a direct relationship with the number of new connections across the region; there are partial relationships for sewage treatment works capacity but other local factors and statutory drivers, such as dry weather flow and permit limits also have a bigger impact on costs.

Table 2-1: Complexities and variation in investment drivers

Area	Activity	Investment driver			
		Regional new connections	Local STW capacity	Local sewerage capacity	Statutory obligation
STW growth	Increase in capacity	✓	✓	✗	✗
	Capacity provision in synergy with WINEP	✓	✓	✗	✓
	DWF schemes	✓	✓	✗	✗
	Strategic capacity enhancement (Poole STW)	✓	✓	✗	✗
New development and growth	Increase in sewerage capacity	✓	✗	✓	✗
Sewer Flooding	Hydraulic flooding (excl. growth)	✗	✗	✓	✗
	Sewer misuse	✗	✗	✗	✗
	Groundwater inundation	✗	✗	✓	✗
	DWMP	✗	✗	✗	✓

The different drivers associated with the areas covered within the growth model are discussed further in the following sub-section.

2.2 Poor representation of complexities from chosen driver

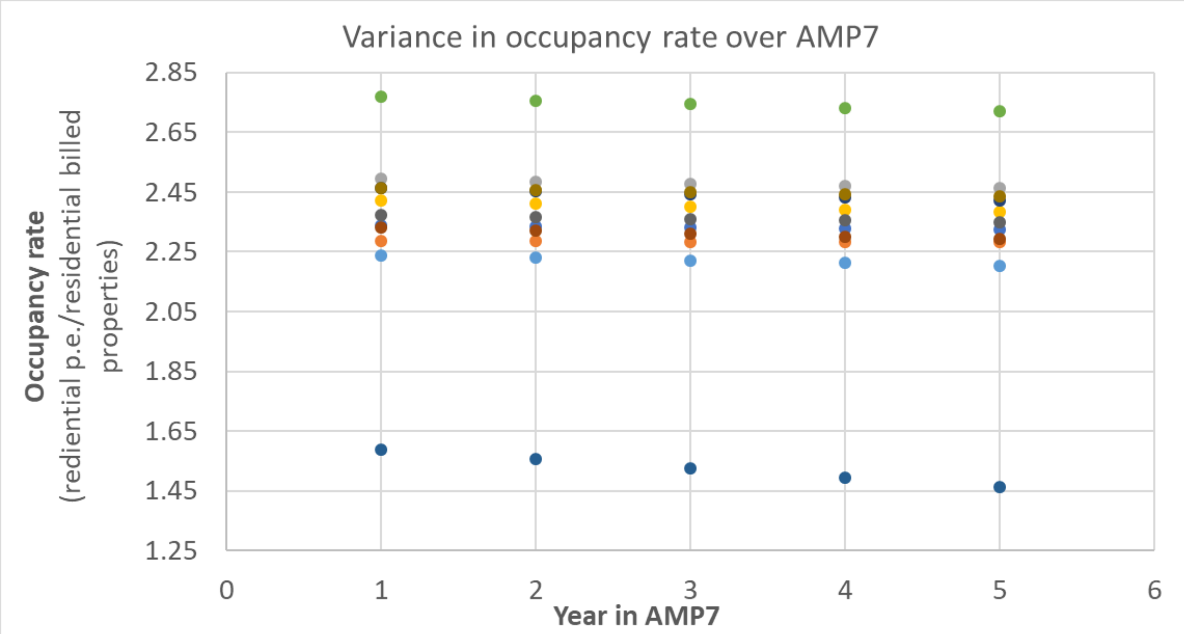
The modelling carried out is overly simplistic given the materiality of expenditure. Growth capex represents 12 per-cent of the aggregate total expenditure (totex) for wastewater network+ for all WaSCs.

Using property growth as an explanatory variable for the entirety of growth investment does not accurately reflect the complexities involved. Measures of load and population equivalent are widely used for understanding other wastewater cost drivers, including use of load in Ofwat's base cost models for sewage treatment and sewage treatment and bioresources combined.

The single driver chosen by Ofwat for the model is number of new connections across the historical and forecast periods. This implies that both household and non-household connections are equivalent in their impact on the sewerage network and connected sewage treatment works. This does not accurately reflect the variances in occupancy rates for household customers across the different WaSC regions, nor the differences in scale of non-household customers.

The variance in residential occupancy rates across AMP7 are demonstrated in the figure below, with the range ranging from 1.46 to 2.78 across the AMP. Given the scale of total new residential connections across WaSCs during AMP7 (an average of 244,000 per year) the differences in occupancy rates would result in total new residents connected to the wastewater system ranging from 373,000 to 670,000 residents per year.

Figure 2-1: WaSC residential occupancy rates



Note: Data from business plan table WWS3, lines 5 and 11

Use of an equivalent population driver would allow for a better representation of actual growth in flow and load volumes, which more accurately represent the influence on expenditure requirements.

We are also concerned that the models do not adequately explain the economies of scale and density/sparsity factors existent in the value chains. Ofwat's models of base costs explicitly recognise the importance of density as a cost driver, through inclusion of explanatory variables relating to density (Number of properties per Sewer, weighted average density, Sewage treatment works per number of properties). The simplistic structure of the enhancement models is at odds with the cost drivers recognised as important for base costs with no reason why density would influence opex and capital maintenance but not capital enhancements.

The model does not reflect the lack of headroom in the existing sewer networks. This is detailed further within section 364.

The model does not reflect the lack of headroom in existing sewage treatment works and the higher costs associated with enhancement at sewage works of smaller size bands. In our cost adjustment claim we highlighted the skew of our investment toward smaller sites.

2.2.1 Differences in Ofwat's approach to opex and capex

The way that Ofwat has approached the cost assessment for the IAP entails significant differences in the treatment of opex and capex. The approach involves marking a boundary between the assessment of the capex proposed by companies and the assessment for the remainder of companies' costs. The data used for the capex growth models do not include operating expenditure associated with enhancements. This distorts the analysis, as companies may have opted for different capex/opex mix in their solutions.

In the capex allowance for growth Ofwat uses WaSCs' forecasts of new connections, given that companies have submitted evidence on the derivation of these forecasts and associated costs. This contrasts with Ofwat's approach of using its own forecasts of cost drivers to calculate allowances for base services, including its forecast on number of properties which is a cost driver in several of its base service models.

Given the materiality of the enhancement programmes, Ofwat should consider undertaking its own forecasts, taking account of range of evidence (e.g. company forecasts, government and local government projections) rather than using a simple average of what was seen in the past. These forecasts could then be applied to both the base costs and enhancement modelling.

2.3 Fit of Ofwat's chosen model

We have significant reservations about the results of the models used, which calls into question the validity of the approach used. We have three main concerns which are discussed below.

2.3.1 Extreme differences in model coefficients

The two models vary solely on the time series used: one uses historical costs and the other forecast costs. The resulting coefficients of the models (new connections: 0.4805 and 1.2574, constant 2.0037 and -0.0288) are significantly different. This calls into question the validity of the approach used, as similar models should have very similar coefficients. Furthermore a consequence of such difference in estimated coefficients is the very large difference in the modelled costs predicted by the two models. For example the modelled costs for Thames Water are £272m under model 1 and £898m under model 2.

2.3.2 Very large variation in efficiency scores

Ofwat's proposed final post-triangulation efficiency score is unacceptably large (0.05 to 1.98). An efficiency assessment that results in the least efficient company (Dwr Cymru in this case) as 40 times (1.98 / 0.05 - 1) less efficient at providing growth than the most efficient company (Hafren Dyfrdwy) is implausible. The only plausible answer is that there is very significant unexplained variation which is not picked up in the models.

2.3.3 The fit of Ofwat's models to the data used in their derivation is poor

We have reviewed the Ofwat forecast and historical model coefficients and compared this to plots of the data used by Ofwat within the growth model, being smoothed new connections and smoothed growth costs (after reallocation). By graphing this data in Excel, linear equations were the best fit for the data. These linear models are considerably different to the log models applied by Ofwat for both the historical and forecast data. This is demonstrated in the Figure 2-2 and Figure 2-3 below. Without the provision of the coefficients of determination for the models derived by Ofwat, consideration of the appropriateness of the growth model is difficult, but these graphs demonstrate the fit to the data is not the most representative.

Figure 2-2: Comparison of Ofwat model and historical data

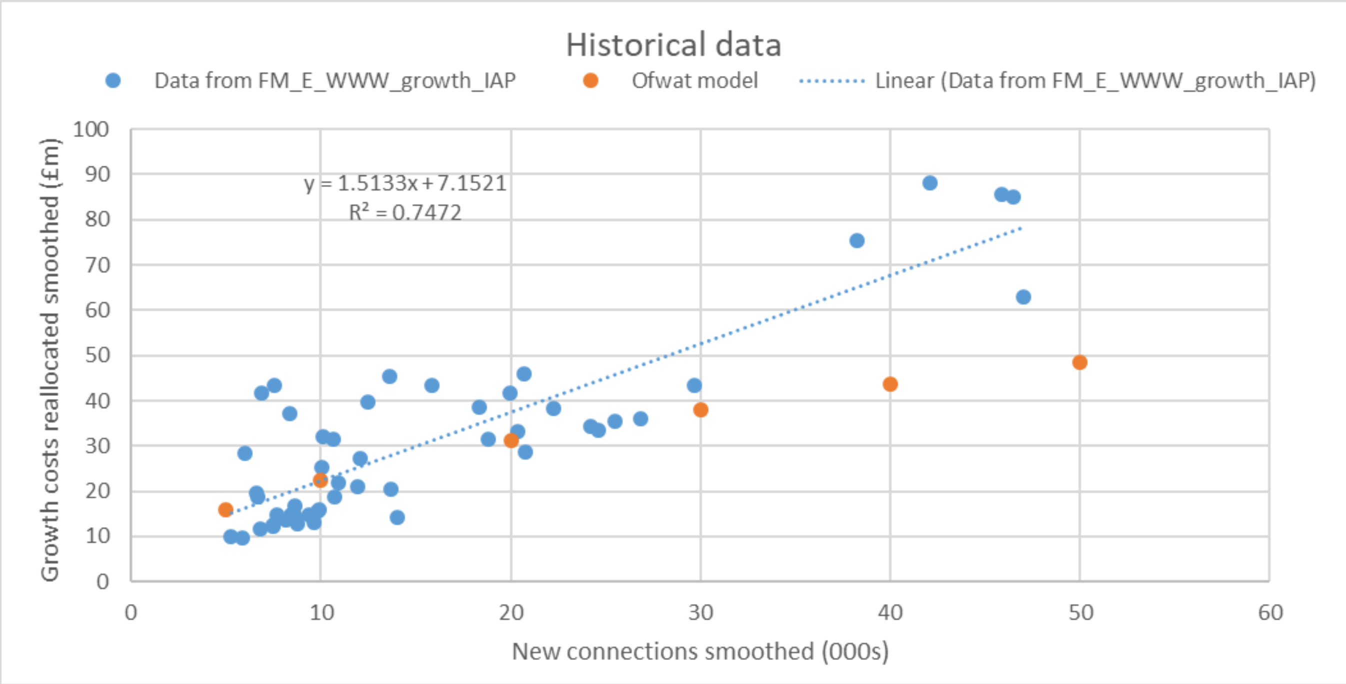
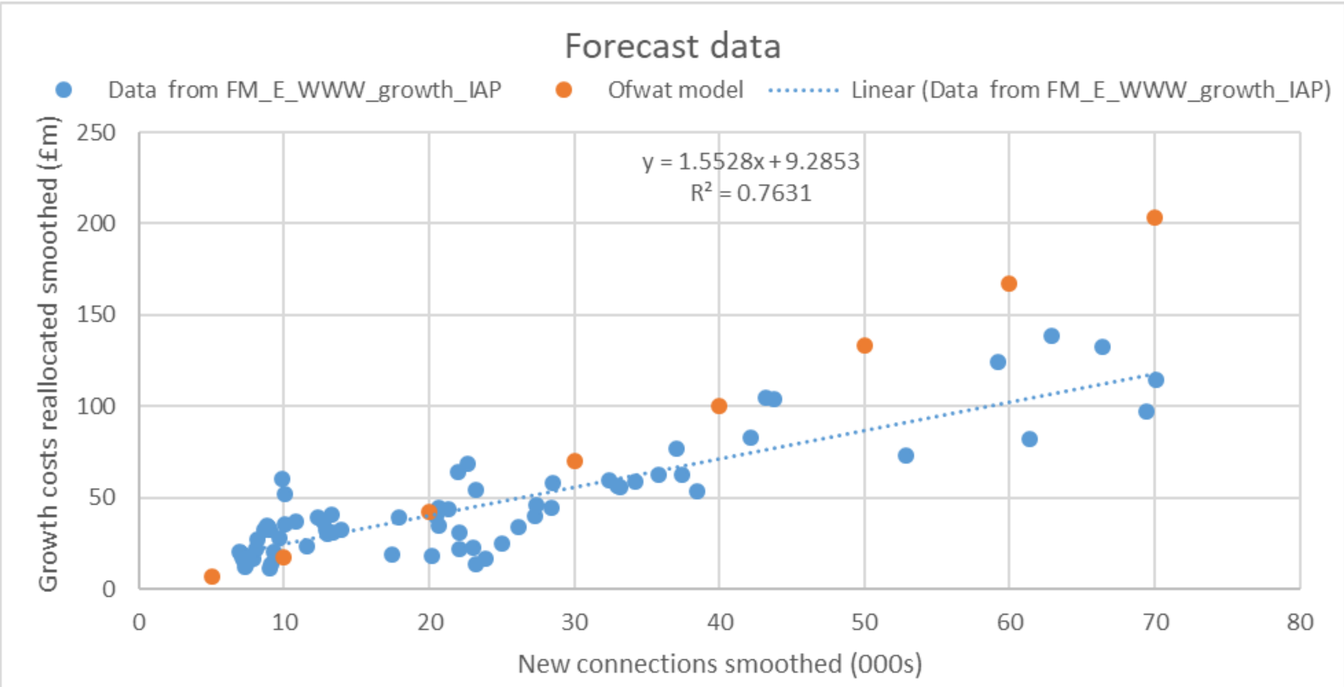


Figure 2-3: Comparison of Ofwat model and forecast data



From a theoretical perspective, the case for using log-log models is questionable for the relationship between enhancement costs and connection volume, whereas a linear model has a more intuitive rationale by assuming the same cost per connection regardless of connection volumes as an approximation (linear or unit cost model) rather than assuming cost per connection rises or falls with connection volume. Ofwat's models suggest cost per connection falls as volume increases on historical data and cost per connection rises as volume increases on forecast data.

3 Sewage treatment works growth – capacity enhancement

Business plan table and Line ref:	Table WWS2 Lines 26 and 73. and Table WWn8 Line 7

Information regarding the costs associated with STW capacity enhancement was summarised within *Supporting document 5.7* of our business plan submission, with the full detail provided within *Appendix 8.6.A*.

3.1 Ofwat's cost assessment

In the deep dive for our cost adjustment claim WSX02 for sewage treatment works capacity programme, Ofwat have rejected the claim advising we have not demonstrated that the substance of our claim uniquely impacts us and that their allowance is not efficient over the long term.

Ofwat state that:

1. *The claim has been rejected as Wessex Water did not demonstrate that the substance of the claim uniquely impacts them and would not equally affect all companies, nor that our allowance is not efficient over the long-term.*[1]
2. *The company presents some high-quality of evidence, however they do not demonstrate the need for adjustment as they have not included any comparisons to the wider industry nor whether their costs are efficient.*[2]

In response to statement (1) above, we have responded to this in detail in section 3.3: Need for adjustment below. In this response to the IAP, we provide evidence as to why the drivers used in Ofwat's models do not accurately represent the complexity of costs associated with factors specific to STW growth:

- There is no scale driver for size of STW
- DWF schemes are only included in the baseline data for one other company (Anglian Water) and due to the use of number of new connections in each region as the primary driver, the influence of Anglian's DWF schemes on the model is dampened.
- There is no driver to account for variations in occupancy rate of new connections and their influence on actual increase in flow and load.

In response to statement (2) above, in section 3.3, our analysis of other companies' plans has shown that DWF is not accounted for within the baseline data used for the forecast growth model. We are one of two companies impacted by this. In section 3.6.1, we have provided further evidence to support that higher costs at small STWs are due to economies of scale.

[1] Text from "Overall assessment result" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

[2] Text from "Assessment of overall quality for IAP scoring" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

In section 3.5 we provide further evidence that our costs are efficient by providing benchmarking specific to our growth programme.

In the deep dive on our cost adjustment claim WSX02 Ofwat made the following assessment:

- Need for investment – partial pass
- Need for adjustment – fail
- Management control – partial pass
- Robustness and efficiency of costs – partial pass
- Customer protections – pass.

We provide below additional evidence to enhance our claim within each of the assessment gates in the following sections.

3.2 Need for investment

3.2.1 Ofwat's assessment

The cost assessment analysis by Ofwat recognises that adequate treatment works are required to maintain compliance and to prevent a deterioration of the quality of receiving waters.

Ofwat confer that "*synergies with enhancement required from WINEP schemes may realise efficiencies.*" The realisation of efficiencies arising from synergies with enhancements required from WINEP is noted and we confirm, as detailed in the annexes within the original submission, that we have, as far as possible, proposed schemes which deliver both a water quality improvement and also provide for capacity enhancement.

Wessex Water have identified that the regional population growth for 2020-25 is forecast to be 100,914 whereas the proposed increase in treatment capacity equates to 138,714 p.e. Ofwat have stated that:

> *It is not sufficiently clear why this level of investment is required to be funded in the AMP (i.e. providing 40% spare capacity)*[3]

We address this issue in section 3.2.3 below.

The deep dive text includes our claim as to why Ofwat's:

> *allowance for enhancement activities for growth at STWs will not be accurate because,*
>
> 1. *The model allows for a variation in parameters for larger work and for diseconomies of scale with weighted expenditure at smaller sites.*
> 2. *Industry data has been inconsistently allocated across lines limiting model accuracy.*
> 3. *The models do not consider variability of costs that require both capacity and the tightening of consents due to increased DWF.*[4]

We discuss these points under the Section 3.3 "Need for adjustment".

[3] Text from "Need for investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[4] Text from "Need for Investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

3.2.2 Derivation of population forecasts

Ofwat state that:

> *the derivation of the population forecasts quoted by the company included in the claim lack auditability and transparency. Moreover, it is not sufficiently clear why this level of investment is required to be funded in this AMP.*[5]

We have adopted an appropriate approach to determine population forecasts. Wherever possible we have reviewed published local plans to ascertain housing development planned by local government to meet the objectives of central government. Local government are also obliged to publish annual monitoring reports detailing progress against proposals included within the local plans. These documents include details on both approved planning applications, sites allocated for future development (both for large- and small-scale developments), together with agreed strategic targets for local areas. We are therefore able to establish robust housing and commercial development information for the short and medium term which, when combined with data on occupancy rates, has enabled population forecasts for each STW to be established. For information on growth beyond each plan period we have assumed a general, conservative , growth factor of 0.5% per annum. We have combined the forecasts for domestic population growth with forecasts for commercial and trade effluent increases, which have been assumed at 0.5% and 0.25% per annum respectively unless we are aware of particular local circumstances.

Growth forecasts, together with references to source information, were provided in the annexes to WSX02. We provide further detail to explain the derivation of our population forecasts in the following table which provides links to published information together with specific comments to explain how we interpreted the growth forecast information available.

[5] Text from "Need for Investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

Table 3-1: Population basis for capacity enhancement by STW

Site name	STW population served (p.e. 2018/19)	Design Horizon	Capacity enhancement (p.e. provided)	Residential p.e. projection source (See Annexes of 8.6.A for more detail)	Additional comment (where required)
AMESBURY STW	9,905	2025	3,346	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	Due to the nature of the development, the rate and size of increase is intrinsically linked with the future decisions of the MOD. To limit overinvestment, we have capped our enhancement to a much shorter design horizon (2025) with plans for future phased expansion as population served is better defined, however this shorter design horizon limits the overall efficiency of this phase of investment.
AVONMOUTH STW	799,129	2025	30,729	Bristol City Council (March 2017) Bristol Local Plan - Bristol Monitoring Report. South Gloucestershire Council (March 2017) Authority's Monitoring Report 2017. North Somerset Council (March 2017) Annual Monitoring Report 2017.	Design horizon for the AMP7 investment to 2025 as this is part of a phased investment in capacity, coincident with the FFT driver. Additional process units will be required in AMP8 to provide sufficient future capacity for growth. Refer to Annex C within *Appendix 8.6.A* for details regarding the Avonmouth STW strategy.
BOURTON STW	1,921	2040	204	No specific Local Plan forecast available for this site – ONS (2014) regional trend applied 0.5% p.a.	The primary driver for this scheme is an increase in FFT. The design horizon takes advantage of synergies with the WINEP scheme.
BURTON STW	266	2040	69	No specific Local Plan forecast available for this site – ONS (2014) regional trend applied 0.5% p.a.	The driver for this scheme is DWF capacity enhancement with the associated pro-rata permit tightening. The design horizon is considered appropriate and efficient for small STWs and the marginal costs associated with a 15 year design horizon given the overall cost of the scheme given the site complexities and tertiary treatment required.
CASTLE CARY STW	3,919	2040	1,331	South Somerset District Council (September 2017). South Somerset Authority Monitoring Report. Annual Monitoring Report 2017.	The primary driver for this scheme is an increase in FFT. The design horizon takes advantage of synergies with the WINEP scheme.

Site name	STW population served (p.e. 2018/19)	Design Horizon	Capacity enhancement (p.e. provided)	Residential p.e. projection source (See Annexes of 8.6.A for more detail)	Additional comment (where required)
COMPTON BASSETT STW	3,684	2040	2,827	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	The drivers for this scheme are split between an increase in FFT and DWF capacity enhancement with the associated pro-rata permit tightening. The design horizon takes advantage of synergies with the WINEP scheme.
CORFE CASTLE STW	2,222	2040	235	Purbeck District Council (August 2017). Purbeck Local Plan Part 1 Monitoring Report – Housing Completions and Commitments. https://www.dorsetforyou.gov.uk/media/223224/Housing-Completions-and-Commitments-2017/pdf/Housing-Completions-and-Commitments-Report-2017.pdf	The primary drivers for this scheme are changes to the discharge permit with the introduction of new parameters. The design horizon takes advantage of synergies with the WINEP scheme.
GREAT WISHFORD STW	2,115	2040	299	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	The driver for this scheme is DWF capacity enhancement with the associated pro-rata permit tightening. The design horizon is considered appropriate and efficient for small STWs and the marginal costs associated with a 15 year design horizon.
HALSTOCK STW	314	2040	39	No specific Local Plan forecast available for this site – ONS (2014) regional trend applied 0.5% p.a.	The primary driver for this scheme is an increase in FFT. The design horizon takes advantage of synergies with the WINEP scheme.
HURDCOTT STW	3,487	2040	652	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	The driver for this scheme is DWF capacity enhancement with the associated pro-rata permit tightening. The design horizon is considered appropriate and efficient for small STWs and the marginal costs associated with a 15 year design horizon.

Site name	STW population served (p.e. 2018/19)	Design Horizon	Capacity enhancement (p.e. provided)	Residential p.e. projection source (See Annexes of 8.6.A for more detail)	Additional comment (where required)
KEYNSHAM STW	18,864	2035	2,544	B&NES Council (March 2017). Bath & North East Somerset Council Monitoring Report. http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/AMR/amr_housing_dashboard_2011-17.pdf	The primary drivers for this scheme are tightening of the discharge permit under a no-deterioration scheme. The design horizon takes advantage of synergies with the WINEP scheme.
LANGPORT STW	10,281	2035	1,039	South Somerset District Council (September 2017). South Somerset Authority Monitoring Report. https://www.southsomerset.gov.uk/media/898612/annual_monitoring_report_2017_issue.pdf	The primary driver for this scheme is growth largely due to an increased ammonia load from trade discharges from an abattoir within the catchment. There is also WINEP driver for phosphorous removal but which will not require synergies in treatment process. Synergies with coordination of construction period for these schemes will be realised where possible to ensure efficient delivery of the schemes.
POOLE STW	168,397	2035	35,479	Borough of Poole (July 2017). Poole Local Plan: Pre submission draft. https://www.poole.gov.uk/EasySiteWeb/GatewayLink.aspx?alId=42600	The driver for this scheme is growth and provides capacity to accommodate future population to a 2035 design horizon. This will facilitate a reduction in capacity during AMP8, when we must demolish the Western Works stream (c. 14% of current flow capacity) to enable construction of a new stream in AMP8/9 within the existing footprint, which will provide future capacity for the longer term.
RADSTOCK STW	24,802	2035	3,025	B&NES Council (March 2017). Bath & North East Somerset Council Monitoring Report. http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/AMR/amr_housing_dashboard_2011-17.pdf	The primary drivers for this scheme are tightening of the discharge permit. The design horizon takes advantage of synergies with the WINEP scheme.

Site name	STW population served (p.e. 2018/19)	Design Horizon	Capacity enhancement (p.e. provided)	Residential p.e. projection source (See Annexes of 8.6.A for more detail)	Additional comment (where required)
RODE STW	1,080	2040	195	Mendip District Council planning, reserved matters permission granted Nov 2017, reference 2016/2113/REM http://www.mendip.gov.uk/planning	The primary drivers for this scheme capital maintenance and changes to the discharge permit. The design horizon takes advantage of synergies with the WINEP scheme.
SALISBURY STW	60,168	2035	9,008	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	The driver for this scheme is growth. The 10 year design horizon takes into account the larger size of the works to ensure a prudent level of investment in AMP7.
SALTFORD STW	118,271	2040	19,937	Wiltshire Council (March 2018). Housing Land Supply Statement. http://www.wiltshire.gov.uk/spp-housing-land-supply-statement-2017-published-2018-march.pdf	Although this is a larger site, the design horizon has been extended to 2040 due to access issues with construction to improve long-term efficiency of capex at the site.
SHILLINGSTONE STW	2,870	2035	268	No specific Local Plan forecast available for this site – ONS (2014) regional trend applied 0.5% p.a.	The primary driver for this scheme is an increase in FFT. The design horizon takes advantage of synergies with the WINEP scheme.
WEST HUNTSPILL STW	61,219	2035	5,599	Sedgemoor District Council (January 2017). Local Plan Consultation: Proposed Submission Local Plan. https://www.sedgemoor.gov.uk/media/713/Proposed-Submission-Local-Plan/pdf/Proposed_Submission_Local_Plan	The primary drivers for this scheme are tightening of the discharge permit under the Bathing Waters Directive. The design takes advantage of synergies with the WINEP scheme, limited to 10 years to account the larger size of the works, ensuring a prudent level of investment in AMP7.
YEOVIL PEN MILL STW	58,959	2035	7,346	South Somerset District Council (September 2017). South Somerset Authority Monitoring Report. https://www.southsomerset.gov.uk/media/898612/annual_monitoring_report_2017_issue.pdf	The primary drivers for this scheme are tightening of the discharge permit. The design takes advantage of synergies with the WINEP scheme, limited to 10 years to account the larger size of the works, ensuring a prudent level of investment in AMP7.
Temporary treatment	-		-	n/a	-

Site name	STW population served (p.e. 2018/19)	Design Horizon	Capacity enhancement (p.e. provided)	Residential p.e. projection source (See Annexes of 8.6.A for more detail)	Additional comment (where required)
DWF Exceedance	19,175	2040	6,337	Based on the four sites most at risk of DWF exceedance (and requiring STW capacity investment), with ONS (2014) regional trends applied, 0.5% p.a.	-
Non-Specific Growth	-		8,206	This was calculated using the unit cost equation, refer to Table 4-1 in *Appendix 8.6.A* for details	-
Total	**1,351,048**		**138,714**	**-**	**-**

3.2.3 Capacity provision

Our proposed capacity provision in AMP7 exceeds the forecasted increase in population across our region. The deep dive raises the query "*Moreover, it is not sufficiently clear why this level of investment is required to be funded in this AMP (i.e. providing almost 40% spare capacity).*"

The primary reason for this exceedance is the investment required at Poole STW. We described in *Appendix 8.6.A*, section 5.2.3 that we need to take a longer-term view at this site and invest in capacity enhancement prior to the site reaching its full treatment capacity. This will then enable a future phase of expansion and ensure compliance in the long term. The site presently suffers from hydraulic and treatment capacity issues and restrictions with available area for expansion within the existing site. In order to facilitate a phased plan of investment to meet future needs whilst ensuring the lowest whole-life cost, investment in capacity enhancement is required in AMP7.

In the short-term, the first phase of development during AMP7 needs to increase Poole's capacity by circa 20% (p.e. enhancement of 35,479). This level of increase in treatment capacity is required to permit a second phase of development in AMP8, involving the redevelopment of the Western Works treatment stream. To allow for future capacity enhancement within the existing footprint, the Western Works stream will require replacement with a new, more efficient, and smaller footprint treatment process. To enable this, the existing Western Works stream (which currently receives 14% of the flow) will require demolition. Part of the additional treatment capacity provided in AMP7 will allow for this demolition.

Additionally, when its p.e exceeds the 10.000 p.e threshold the UWWTD will require our Lytchett Minster STW, on the outskirts of Poole, to provide Nitrogen removal. Based on our population forecasts this threshold will be surpassed early in AMP8. Our appraisal of options has shown that the most cost effective solution will be to transfer the flows from Lytchett Minster to Poole STW. Poole STW already has a nitrogen permit and associated treatment for nitrogen reduction, as will the planned expansion in AMP7. The flows from Lytchett Minster STW equate to circa 6% of the current site population equivalent at Poole STW and part of the additional treatment capacity provided in AMP7 will accommodate this transfer of flow and load.

This is elaborated further in Annex N of *Appendix 8.6.A*, where we outline our long-term plan for Poole STW to accommodate growth within the constrained site footprint.

3.3 Need for adjustment

Ofwat's assessment[6]:

> *The company does not provide convincing evidence that the allowances would 'in the round' be insufficient to fund the cost factor as it does not show how it has unique characteristics compared to other companies, nor whether our allowance does not represent the long-run efficient cost.*

This is addressed in sections **Error! Reference source not found.** and 3.3.2 below.

[6] Text from "Need for Investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

As all companies face population growth and resulting permit exceedance, even if the cost factor is not explicitly included in the model, we are still implicitly capturing an allowance through the econometric model.

This is addressed in section 3.3.2**Error! Reference source not found.** below**Error! Reference source not found.**.

The company's claim focuses instead on the fact that its expenditure profile is different this AMP compared to the previous AMPs as more enhancement investment is needed at smaller works. This is therefore a claim on the 'profile' or 'lumpy' nature of enhancements, rather than the long-run level. As our models include a scale driver, the models compensate companies for their average long run expenditure for their STWs.

This is addressed in sections 3.3.3 and 3.3.4 below**Error! Reference source not found.**.

3.3.1 Challenge to Ofwat's claim that models fund average long-run expenditure

Ofwat consider that we have not demonstrated allowances would 'in the round' be insufficient to fund the cost factor and that funding for the growth proportion of our quality driven schemes will not be allocated for the current price control period:

There is also a potential intertemporal implicit allowance. As some schemes are driven by quality needs rather than growth, with the proposed growth schemes arising from anticipated needs and synergies with quality, there is an implicit allowance for these schemes in the long run efficient allowance for this enhancement line. WSX should undertake this investment now if this is the most efficient option, but it can recover these costs in the future. Similarly, WSX costs the schemes to be forward looking, including future population growth. While this is efficient, again Ofwat would not allocate these costs in the current price control period.[7]

The company's claim focuses instead on the fact that its expenditure profile is different this AMP compared to the previous AMPs as more enhancement investment is needed at smaller works. This is therefore a claim on the 'profile' or 'lumpy' nature of enhancements, rather than the long-run level. As our models include a scale driver, the models compensate companies for their average long run expenditure for their STWs.[8]

As discussed in section 3.2.3, the additional capacity provision over the regional growth is primarily not attributed to the quality driven schemes, but rather due to the Poole STW growth scheme and the phasing requirements at this constrained site.

Throughout the assessment of our STW growth cost adjustment claim, Ofwat make reference to long-term allowances being sufficient in the round. However, based on the approach of cost allowances Ofwat have applied at PR19, if this method were to be applied for future business plan periods, this would not be the case.

Where companies have lower capex within their PR19 submissions than what has been calculated in the modelled allowance, the actual capex allowed is the lower of the two. The outlined approach by Ofwat is:

Where a company's requested investment level is less than our determination, we use the company's business plan costs.[9]

[7] Text from "Implicit Allowance" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[8] Text from "Need for adjustment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[9] Text from "Cover" tab, within file FM_E_WWW_growth_IAP

This is demonstrated in the "Allowance" tab of FM_E_WWW_growth_IAP, which lists the following:

Table 3-1: Wholesale wastewater growth allowances

Company	Planned capex after reallocations (£m)	Modelled allowance (£m)	Capex allowed - wholesale wastewater (£m)
ANH	474.610	382.157	382.157
HDD	0.589	10.477	0.589
NES	244.558	99.249	99.249
NWT	203.041	246.118	203.041
SRN	273.164	205.692	205.692
SVE	290.189	332.820	290.189
SWB	102.194	75.495	75.495
TMS	622.892	584.829	584.829
WSH	166.741	90.759	90.759
WSX	178.813	121.444	121.444
YKY	186.537	192.082	186.537
Total	**2,743.328**	**2,341.123**	**2,239.982**

We can clearly see that both Ofwat's stated approach to enhancement cost assessment, and its IAP allowances, provides the lower of a company's business plan capex and its modelled allowance. This asymmetric approach means that Ofwat's statement in the extract above (that its models compensate companies for their average long run expenditure for their STWs) is misleading. Even if the models provided for a long-term average capex allowance, Ofwat's approach of using company forecasts for allowances, if these are lower than the modelled costs, means that the allowances derived from its approach will be systematically less than the long-term average in a context of lumpy investment profiles. The statements in the IAP about "intertemporal implicit allowance" and average long-run expenditure provide no justification for dismissing the points we have made about the profile of STW investment over time.

3.3.2 Variability of data across WaSCs and the unique impact on Wessex Water

In our business plan submission we made the claim that:

> *3. The models do not consider variability of costs that require both capacity and the tightening of consents due to increased DWF.*[10]

At the time of submission of our business plan we did not have visibility of other WaSC's business plans to demonstrate our "*unique characteristics compared to other companies*"[11] with respect to spread of capex across size of STWs, nor an allowance for higher costs of DWF schemes. Growth schemes at STWs which also require a permit tightening due to DWF permit increase not only require investment in capacity enhancement, but also must

[10] Text from "Description of claim" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[11] Text from "Need for Investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

produce a step-change in treatment quality and hence require the addition of a tertiary treatment stream.

In our business plan submission, we focussed on how these factors were outside of management control, demonstrating how economies of scale at small sites have skewed our historical expenditure compared to Ofwat's allowance and demonstrated the disproportionate costs associated with DWF schemes, further amplified when these are also required at small sites. The proportion of our total capex for PR19 is weighted to sites with these attributes, and more so than previous AMPs. Further detail of this and discussion of the high unit costs associated with these schemes was outlined in section 4 of *Appendix 8.6.A* of our submission. In summary, 33 per-cent of our PR19 capex proposed for STW growth is attributed to sites where DWF schemes are required and these are also at sites less than 5,000 p.e. We did not have any DWF schemes in AMP6 and prior to this they were funded under a quality driver. We discuss the proportion of our overall STW growth capex skew to smaller sites in PR19 further in section 3.3.3 below.

The data tables for PR19 (and for JAR/APR submissions) do not include the granularity of information for us to assess the attributes against other WaSCs (i.e. for proportion of capex at small sites and allocation and costs to DWF schemes). Through review of the published documentation available from other WaSCs for their PR19 submissions, we have ascertained a view of this information for comparison. This is summarised for each WaSC in the following table to identify if they have included DWF permit change schemes (with investment implications) and the proportion of their STW growth capex expenditure at small sites (where available).

Table 3-2: Analysis of other WaSCs' business plans for STW growth programmes

WaSC	Proposals for STW growth
Anglian Water	Programme covers growth capacity at sewage treatment plants and some DWF schemes. The DWF schemes with growth as the primary driver and coincident at small sites (<10,000 p.e.) have higher unit costs (against estimated p.e. capacity provided) ranging from £1,800-£119,500/p.e. provided. Investments to increase capacity at sites where a population threshold has been crossed under the UWWTD, have been allocated to Line 20 (reduction of sanitary parameters) in Table WWs2 distorting model analysis for Line 26.
Northumbrian Water	Programme includes work at 5 STWs ranging in size from 1736 p.e. to 16,764 p.e. together with a major scheme (circa £90M) for one large STW. This single scheme at a large STW represents over 80% of their growth capex. No DWF schemes identified.
Severn Trent (England)	Growth capacity is only being provided at sites where there is also a WINEP3 driver. No DWF schemes identified.
South West Water	No details published
Southern Water	1 major scheme with a cost adjustment claim submitted 17 schemes identified (9 > £10M Totex). For the documentation available we have estimated that a maximum 23% of the total growth totex is attributed to small sites (<10,000 p.e.) No growth funding included for DWF schemes – costs included in base capital maintenance

WaSC	Proposals for STW growth
Thames Water	Only summary version of plan published, no supporting documentation available to determine specific details with respect to growth programme.
United Utilities	21 defined schemes identified. No direct reference to DWF schemes
Welsh Water	9 STW growth-led schemes, information not available to determine capex for each site but only 2 out of these 9 sites are less than 10,000 p.e. and all are over 2,500 p.e. Welsh Water funding for DWF compliance schemes but they assign this all to their base capital maintenance allowance and not growth.
Yorkshire Water	20 schemes, 4 of which are included within a cost adjustment claim. Incorrect allocation of growth expenditure due to primary driver method (refer to section 3.3.4 for further detail). No specific mention of DWF schemes.

From our analysis of the other WaSC's business plans, we do not agree with Ofwat's statement that DWF permit changes are captured in the implicit allowance (*As all companies face population growth and resulting permit exceedance, even if the cost factor is not explicitly included in the model, we are still implicitly capturing an allowance through the econometric model*)[12].

In addition to Wessex Water, only three of the WaSCs have included funding for DWF schemes, with two of these allocating this expenditure to capital maintenance funding rather than STW growth. Where a STW is at risk of failing its DWF permit compliance, we first determine if the observed flows are reasonable for the connected population within the catchment, followed by an investigation into infiltration within the associated sewerage catchment. We undertake sewer sealing where appropriate to reduce flows, for which the expenditure is allocated against our base capital maintenance. Where it is determined that DWF compliance is genuinely at risk due to growth within the catchment, meeting the pro-rata tightened permit is not within the treatment capability of the STW and thus investment in capacity and process enhancement is required, we allocate this capex to the growth line (i.e. Line 26 in WWS2). We do not believe any funding for DWF capacity or process enhancement at a STW should be attributed to capital maintenance. The EA driver funding principles for PR19 aligns with this approach for DWF schemes:

> "*Investment to accommodate growth beyond the permit headroom should not be included under prevent deterioration, but should be included in Water Company business plans, as a supply demand scheme*."[13]

Anglian Water appear to have a similar proportion (30-40%) of their total STW growth capex attributed to DWF schemes to Wessex Water (33%), with similar extremes in unit rate cost of capacity enhancement for these schemes. Whilst these costs are included in the data used in Ofwat's model derivation, the overall influence of these, plus Wessex Water's DWF scheme costs, is small significant as together they represent less than 8% of the total industry STW growth capex.

[12] Text from "Need for adjustment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[13] Environment Agency (March 2017). PR19 Driver Guidance – Prevent Deterioration (WQ) FINAL (003).

Anglian Water are providing STW capacity enhancement of less than 60 per-cent of regional growth in resident and non-resident populations over AMP7[14]. With the selection of new connections as Ofwat's forecast driver for the IAP allowance, Anglian Water's deficit in STW p.e. enhancement compared to their regional growth in connections therefore dampens the overall impact of their higher costs associated with their DWF schemes in the STW growth category. Conversely Wessex Water are providing greater p.e. enhancement than the regional growth figure. Despite the inclusion of Anglian's DWF schemes within the data used in the forecast model, the high cost of the DWF schemes is not represented within the growth model and uniquely impacts Wessex Water.

Anglian Water are investing in further capacity at one of their large STWs at Cambridge but combining this through local government funding for relocating the site[15].

3.3.3 Implicit allowance model variation and the variances in Wessex Water's STW growth costs

The chosen single cost driver, new connections, for Ofwat's allowance models in the IAP does not allow for variation in company activity and characteristics. Whilst Ofwat have stated that the model includes for a scale driver with respect to overall population increase, they also state that:

> *The econometric model specification does not include a treatment scale driver but there is likely to be an additional implicit allowance from company scale, e.g. through the number of connections or through population.*"[16]

As discussed in section **Error! Reference source not found.**, the chosen driver of number of new connections in fact does not allow for differences in density through occupancy rate, nor does it account for differences in flow and load associated with household and non-household connections.

Ofwat's assessment also states[17]:

> *The company claim that our allowance for enhancement activities for growth at STWs will not be accurate because,*
>
> 1. *The model allows for a variation in parameters for larger work and for diseconomies of scale with weighted expenditure at smaller sites.*

With regard to point 1) above this is an incorrect quote from our submission. In section 3.1 of *Appendix 8.6.A – Claim WSX02 – Sewage treatment works capacity programme* we commented on the models published by Ofwat on the 29/03/2018. These models included various activity and system characteristics including:

- total number of sewage treatment works
- number of sewage treatment works in size band 5 and above
- % of sewage treatment works in size band 5 and above
- load per sewage treatment work

[14] From Anglian Water's business plan tables:

- WWn4 line 25, p.e. treatment capacity enhancement = 256,708.
- WWS3 lines 11 and 12, resident and non-resident population growth = 441,847

[15] https://wwtonline.co.uk/news/anglian-agrees-deal-to-relocate-cambridge-treatment-works

[16] Text from "Implicit Allowance" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

[17] Text from "Need for Investment" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

- % of load treated in size bands 5 and above.

We commented that "*The model allows for a company's overall distribution of sites with respect to larger size sites,* ***but not for*** *diseconomies of scale with weighted expenditure at small sites.*" Further detail is presented in section 3.6 of this document, in response to the further analysis of our claim.

Ofwat uses density for its base cost model specifications. Unless Ofwat adjusts for density in its main enhancement cost models then our claim for the need for adjustment beyond modelled allowance on density grounds still stands. This density issue is only one of several issues where we have concerns about the modelled allowance as discussed further throughout the subsections following.

Furthermore, the model adopted by Ofwat at IAP for PR19 uses only new connection figures and it therefore makes no allowance for a company's overall distribution of sites by taking into account, for example, the number of larger (>Band 5) sites.

The model also makes no allowance for the impact of having to invest at a greater number of smaller sites with disproportionately higher unit costs.

Even if Ofwat were to include a scale driver for spread of load across STW size bands this would not allow for the unique impact of the spread of our investment expenditure proposed for PR19. The spread of Wessex Water's capex at smaller sites does not represent the spread of load treated across the various size bands, as highlighted in Table 3-3 below.

Table 3-3: Wessex Water split of load by size band

F	Load received at STWs in 2018-19	$kgBOD_5$/ day[1]	% split by load	AMP7 growth capex (£m)	% split by capex
1	Load received by STWs in size band 1	637	0.3%	0.12	0.2%
2	Load received by STWs in size band 2	637	0.3%	4.75	7.9%
3	Load received by STWs in size band 3	6,905	3.8%	3.65	6.1%
4	Load received by STWs in size band 4	19,286	10.5%	20.12	33.5%
5	Load received by STWs in size band 5	27,362	14.9%	7.97	13.3%
6	Load received by STWs above size band 5	129,109	70.2%	23.43	39.0%
7	**Total load received**	**183,936**	**100.0%**	**59.9**	**100.0%**

Note 1: BOD figures from Business Plan Table WWn4

Wessex Water treats less than 15 per-cent of the total load received across our region at sites less than 10,000 p.e (size band 4 and under), whilst our total required capex at these sites in PR19 is nearly 50 per-cent of our total expenditure. In AMPs 5 and 6 our STW growth capex at small sites was 20 per-cent and 30 per-cent respectively, which again was greater than the spread of load received and treated at these sites.

Use of new connections as the model driver does not allow for variances in capacity provision with respect to regional growth.

3.3.4 Industry data consistency

As we highlighted in our business plan submission, for previous AMPs:

2. *Industry data has been inconsistently allocated across lines limiting model accuracy.*[18]

The forecast and historical models do not adjust for errors in expenditure allocation by Yorkshire Water who consistently assign all enhancement costs to the primary driver line within their data tables. They have done this in previous AMPs, as stated in our submission (refer to section 3.1 of *Appendix 8.6.A*), and again for their PR19 submission. There are clearly schemes for which there are combined quality and growth drivers, but for which they have wholly assigned costs to the various WINEP capex lines in table WWS2. Yorkshire Water have stated that:

> "*It should be noted that Line 25, the PE treatment capacity enhancement, includes growth elements from growth and quality schemes… We have identified the changes in Population Equivalent associated with each of the WINEP drivers and these reflected in this table. The WWS2/2a table guidance requires us to <u>map expenditure to the primary driver</u>. As such, there may be PE changes to drivers which do not align with the expenditure within the corresponding lines in table WWS2*"[19]

Ofwat's guidance for allocating capex in WWS2 states:

> *"Where a quality enhancement scheme (or the proportionally allocated component of a quality enhancement scheme) has more than one cost driver, companies should allocate the expenditure attributable to the primary driver to the relevant line. <u>Any net additional cost for meeting the requirements of any further drivers should be included in the (different) relevant line.</u>"*

The consistent misreporting of the total capex for growth by Yorkshire Water influences the data used by Ofwat in determining modelled allowance, thus misrepresenting the average costs for growth across the industry.

Severn Trent also skew the allowance models as they have only included STW growth schemes where there is also a WINEP driver:

> "*When agreeing the WINEP3 enhancement measures with the Environment Agency, we <u>deliberately sought to promote sites</u> where we were aware of significant supply/demand pressures…. For AMP7, we have successfully <u>avoided the need to include any 'stand-alone' supply demand projects in our plan"</u>*

Although Wessex Water have a collaborative relationship with the EA and have worked together to include the best WINEP drivers to meet the desired environmental outcomes, we cannot restrict investment in capacity enhancement to only those sites at which there is also an environmental enhancement need.

The sites where we have primary drivers for capacity enhancement have occurred where this is the main or standalone need for investment due to development within those catchments and is largely outside of management control.

Whilst we agree that it there are efficiencies gained by creating synergies between growth and quality schemes, the ability to completely manage these needs are outside of management control. Severn Trent appear to have a unique advantage by the fact that all

[18] Text from "Description of claim" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

[19] Yorkshire Water PR19 data table commentary, table WWn4, Page 220. https://www.yorkshirewater.com/media/1377/commentary-for-the-data-tables.pdf

their schemes for AMP7 have combined drivers and thus further influencing the average costs for growth across to be unrepresentative of the industry.

3.4 Management control

Ofwat suggest that:

> *water companies can influence regional development plans but population growth and its distribution across the catchment area not fully in management control.*[20]

Although we partially concur with this view, we would stress that our influence on development plans is limited. Our only real influence is often on the timescales for development rather than complete deferral or selection of location and associated STW catchment within which they fall.

Ofwat indicate a partial pass as we have:

> *not evidenced that they have fully explored the long-term cost benefit of further rationalising their sites*[21]

We routinely explore the costs and benefits of further site rationalisation. We provide such evidence below of previous and current assessments, which should enable the partial pass to be converted to a full pass.

Options for STW rationalisation are, except where clearly impracticable, always considered on a whole-life costs basis when enhancement or major refurbishment of a STW is required. Examples where this has been shown to be cost beneficial and the option adopted are demonstrated in the following table:

Figure 3-4: Examples of AMP5 and AMP6 STW rationalisation schemes

Site name	Driver	Year transferred	Description
Doulting STW	Growth	2011	Flows transferred to Shepton Mallet STW; Doulting STW demolished.
Holton Heath STW	Quality	2012	Flows transferred to Wareham STW (STW expanded). Treatment works at Holton Heath eliminated. (Storm Overflow retained)
Station Road STW, Cheddar	Maintenance	2017	Flows transferred to Cheddar (main) STW. STW demolished.
Falfield STW	Maintenance	2016	Flows transferred to Leyhill STW (following adoption by Wessex Water of the Leyhill site). Falfield STW demolished.
Grittleton STW	Quality	2018	Flows pumped to Hullavington STW. Grittleton STW eliminated.
Kilmersdon STW	Quality	2018	Flows pumped to Radstock STW Kilmersdon STW demolished.
Combwich STW	Quality	2018	Flows pumped to Cannington STW (with UV treatment provided at Cannington) Combwich STW eliminated. (Storm Overflow retained)
Dunball STW	Quality	2018	Flows transferred to Chilton Trinity STW Dunball STW demolished.

[20] Text from “Management Control” box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP
[21] Text from “Management Control” box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

Flow transfer often involves significant cost for both capex and an increase in opex for pumping and for increase in treatment load at the receiving works. It is more likely to be viable when a quality enhancement is required as this would typically involve a greater investment at the STW to deliver the outcome. Consideration of the ability of the receiving watercourse to accept an increase in load is also required; any significant increase in flow at an STW is reviewed by the EA to determine if this would result in deterioration in the quality of the receiving water body.

The following table provides information on why rationalisation would not be appropriate for the sites we are promoting that need capacity enhancement.

Table 3-5: STW growth schemes - rationalisation assessment

Site name	Description
AMESBURY STW	Area also served by Ratfyn STW. Catchment division split to optimise capacity at each STW. Ratfyn is also absorbing MOD development at Larkhill and Bulford
AVONMOUTH STW	Wessex Water's largest STW (799,000) p.e. – not suitable for transfer
BOURTON STW	Site serves 1,921 p.e. Transfer to Gillingham STW 5km to the south technically feasible but would require network enhancement. Gillingham STW is capacity limited.
BURTON STW	Transfer to Great Badminton STW reviewed and discounted due to higher cost than selected option (refer to Annex E of *Appendix 8.6.A*).
CASTLE CARY STW	Topography and distance to an alternative STW with sufficient headroom and ability to meet quality outputs is not viable alternative.
COMPTON BASSETT STW	The option to transfer flows to Calne STW was considered but discounted due to cost compared to alternative options.
CORFE CASTLE STW	There are no sites within a reasonable distance that present the opportunity to transfer flows to an alternative catchment.
GREAT WISHFORD STW	The option to transfer flows to Salisbury STW was considered but discounted due to cost compared to alternative options. (refer to Annex I of *Appendix 8.6.A*).
HALSTOCK STW	There are no sites within a reasonable distance that present the opportunity to transfer flows to an alternative catchment.
HURDCOTT STW	The option to transfer flows to Salisbury STW was considered but discounted due to cost compared to alternative options. (refer to Annex K of *Appendix 8.6.A*).
KEYNSHAM STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.
LANGPORT STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.
POOLE STW	Partial site relocation was considered to alleviate pressures related to site spatial limitations. Due to the lack of available undeveloped land within a reasonable distance, even partial relocation of some the STW flows was estimated to be significantly higher cost than a phased development within the existing site boundary. Consideration was given to total site relocation including land valuation of the existing site, however due to the size of population the STW serves, this again would be uneconomic compared to a phased expansion of the existing site. This is discussed in Annex N of *Appendix 8.6.A* of our submission.
RADSTOCK STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.

Site name	Description
RODE STW	The option to transfer flows to Trowbridge STW was considered but discounted due to cost compared to alternative options (c.2.5x greater than the presented options). This was a high-level option considered to more detailed consideration of treatment options and was discounted early due to the distance required for pumping. This was not previously outlined in the associated Annex for Rode but was included within our internal options spreadsheets.
SALISBURY STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.
SALTFORD STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.
SHILLINGSTONE STW	There are no sites within a reasonable distance that present the opportunity to transfer flows to an alternative catchment.
WEST HUNTSPILL STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.
YEOVIL PEN MILL STW	This is one of our larger STWs and no sites exist within a reasonable distance that present an opportunity for transfer of flows.

3.5 Robustness and efficiency of costs

Ofwat have recognised that evidence has been provided for the methodology we have used to assess the need for investments with an options appraisal and cost benefit analysis. Third party evidence has also been provided to demonstrate that costs are robust and efficient through comparative benchmarking. This demonstrates that overall, for all enhancement schemes, our costs are lower than those estimated by external assurers. Ofwat identify that specific cost benchmarking for growth at STWs that would be specific to this claim has not been provided. In our *Supporting document 8.11 – Assessing the costs of our enhancement programme* within Section 4 we provided information on the benchmarking exercise undertaken to demonstrate that our construction costs were robust and efficient. The table provided covered our overall enhancement programme.

To address Ofwat's concerns that a specific cost benchmarking is provided for growth at STWs we have reviewed the benchmarking exercise data and analysed only for those schemes with a STW capacity component.

Table 3-6: Benchmarking for STW capacity scheme costs

Construction costs	Variance between Wessex Water cost estimate and External benchmark costs estimates	
	Mean %	Median %
Sample of water and wastewater projects	-1.1%	-6.0%
Sample of STW Capacity projects	-1.8%	-15.0%

This shows that our estimates are slightly lower than those provided by the external cost consultants and that the variance between our estimates and those of external benchmark costs estimates is slightly greater for STW capacity projects than when the enhancement programme is considered as a whole.

Our benchmarking exercise also reviewed non-construction cost percentages. These will be applicable to the STW capacity projects.

Table 3-7: Benchmarking non-construction costs for enhancement schemes

% add on for non-construction costs	Wessex Water estimate %	Cost consultants estimate %
Third party costs, such as planning permission, land, highways	2.0%	2.0%; cost consultants in agreement with our value
Design and project management - for projects with a value less than £2m	18.3%	Large range from 16% to 54%, with central estimate of 37%, which is greater than our allowance – refer to *appendix 8.11.B*
Design and project management - for projects with a value greater than £2m	15.4%	Large range from 21% to 37% with central estimate of 27%, which is greater than our allowance – refer to *appendix 8.11.B*
Risk	13.75%	Very large range of 20% to 50%; all greater than our allowance

Our add-on percentages for non-construction costs are lower than those considered appropriate by external cost consultants.

By taking the results of the benchmarking of the construction costs for STW capacity schemes and the add-on percentages for non-construction costs together, it is possible to compare the overall cost of the proposed programme of work for STW capacity projects.

This is shown in the table below where our standard additions have been applied to Wessex Water estimates as shown in the table above and the following assumptions made for cost consultant estimates:

- Third party costs, +2% (as Wessex Water)
- Design & project management Schemes <£2M, Central estimate +37% of construction and third party costs
- Design & project management Schemes >£2M, Central estimate +27% of construction and third party costs
- Risk, lower bound of range indicated by cost consultants +20% of total construction, third party and design & project management costs.

Table 3-8: Benchmarking overall costs of STW capacity schemes

STW capacity programme	Wessex Water estimate £m	Cost consultant estimate mean £m	Cost consultant estimate median £m
Construction costs	60	61.1	63.6
Third party costs	1.2	1.2	1.3
Design & project management			
Schemes <£2M – 10% programme	1.1	2.3	2.4
Schemes >£2M – 90% programme	8.5	15.1	15.8
Sub total	70.8	79.7 (+13%)	83.0 (+17%)
Risk	9.7	15.9	16.6
Total	80.5	95.7 (+19%)	99.6 (+24%)

This shows that our estimates are circa 13 per-cent lower than the mean benchmark cost for projects including a STW capacity component, and potentially 19 per-cent lower depending on the allowance for risk.

3.6 Further analysis

The following subsections address the comments made by Ofwat in the "Further Analysis" section of the deep dive text for this cost adjustment claim, where not addressed previously.

3.6.1 Economies of scale at small STWs – further evidence

Ofwat state:

> "*no evidence is provided that economies of scale exist with respect to the size of the STW, as WSX claim*"[22]

The choice of model specifications that Ofwat use for its base cost modelling for sewage treatment take account of the treatment works size band and models for wastewater overall take account of measures of density. This is consistent with the idea that less dense areas will tend to have smaller treatment works with higher unit costs. So Ofwat's own approach to econometric modelling of base costs recognises the importance of allowing for economies of scale.

From our own data on STW size and previous enhancement expenditure, it is clear that capacity enhancement at smaller sites have a much higher unit cost.

Figure 3-2 and Figure 3-3 set out the unit costs of capacity enhancement (£/p.e. provided) against STW size (2018 p.e.). This demonstrates that economies of scale with respect to the size of the STWs do exist. These figures were also presented in *Appendix 8.6.A* of our submission, where we used capacity enhancement (p.e. provided) to represent our claim.

As with our business plan submission, we have presented our STW growth unit costs on separate graphs, to allow the differences in scale for DWF schemes to be clearly shown.

[22] Text from "Further Analysis" box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

Figure 3-2: PR19 STW DWF growth scheme unit costs against STW p.e.

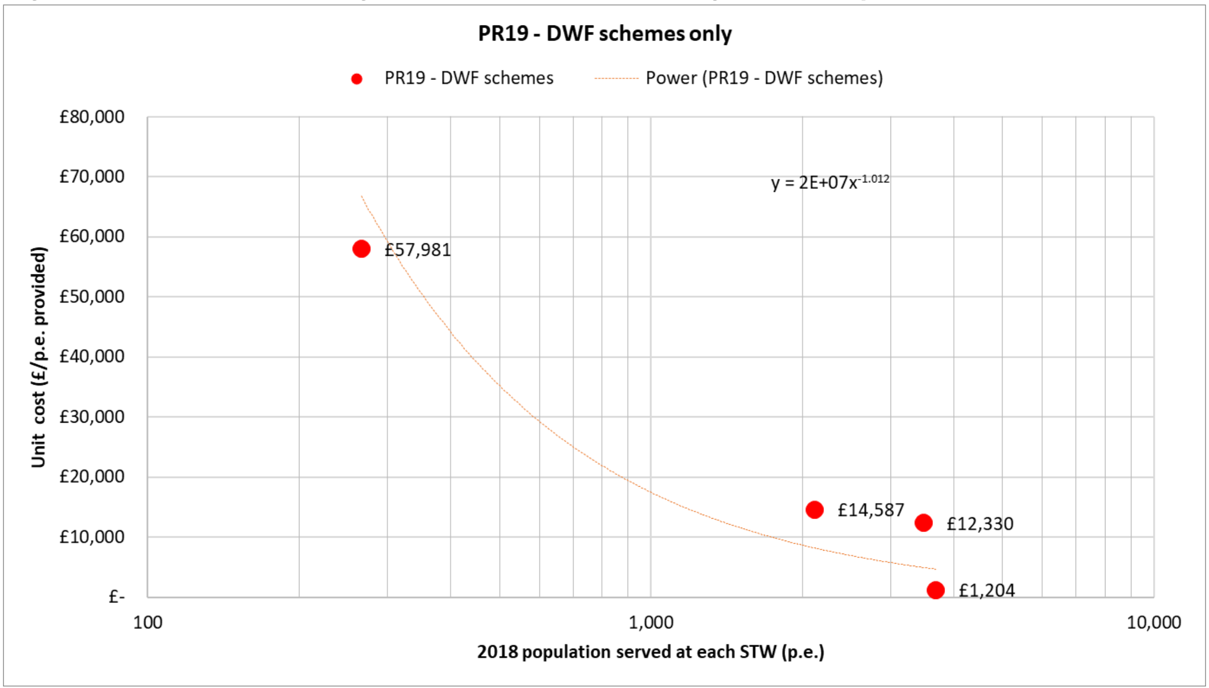
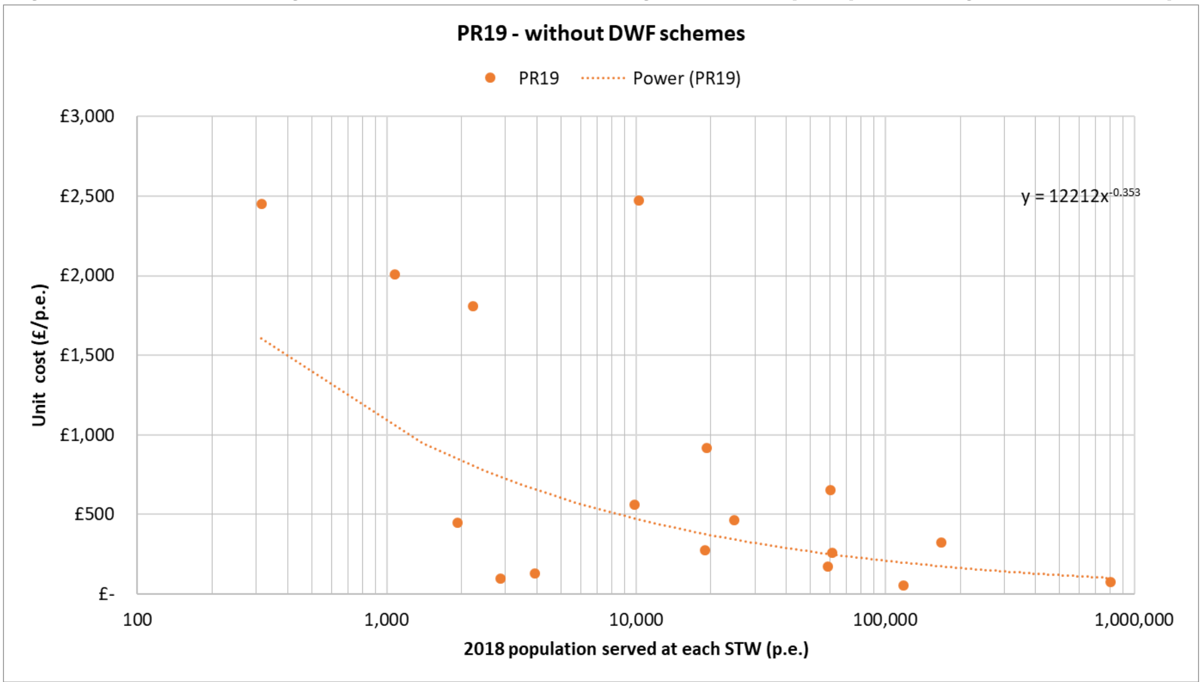


Figure 3-3: PR19 STW growth scheme unit costs against STW p.e. (excluding DWF schemes)



Both Figure 3-2 and Figure 3-3 demonstrate the economies of scale of undertaking work at larger STWs, demonstrating that using population served at each STW as the independent variable presents a similar relationship with unit cost to p.e. capacity provided.

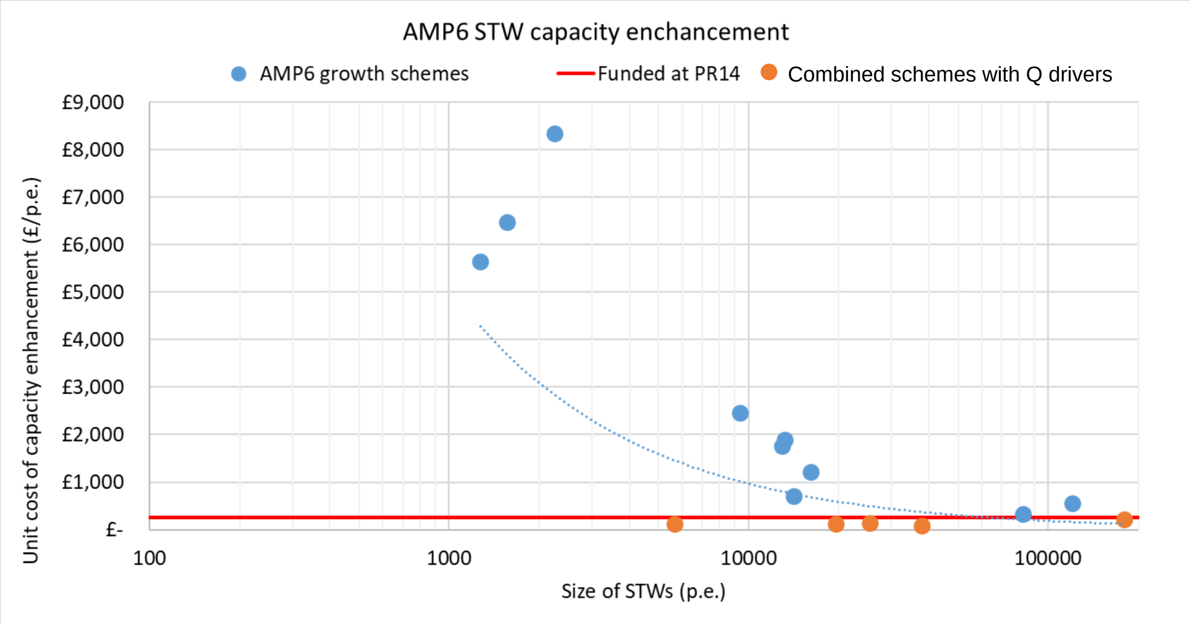
Furthermore the figures demonstrate the high unit costs for the DWF schemes which are an order of magnitude greater than other growth schemes. The economies of scale with small STWs further intensifies the high unit costs of DWF schemes.

Whilst the data presented in unit cost curves in Figure 3-2 and Figure 3-3 represents Wessex Water's costs, these costs have been externally benchmarked as outlined in section

3.5. This would suggest that the economies of scale at smaller sites is also representative of industry costs.

The economies of scale at smaller sites is also evident in our STW growth schemes in AMP6 as presented in Figure 3-4 below. This plot also shows the efficiencies with schemes with joint quality drivers.

Figure 3-4: AMP STW growth schemes - with drivers



This evidence shows that economies of scale do exist with respect to the size of the STW. This applies to both DWF schemes and growth schemes.

3.6.2 Efficiencies

Ofwat state that:

1. *The unit cost evidence presented in Section 4 (WSX business plan submission 8.6.A) helps to rebut the claim: DWF schemes do seem to exhibit strong economies of scale.*
2. *However, the schemes without DWF requirements show that a similar number of schemes lie above as well as below the curve (average still exceeding Ofwat allowance).*
3. *This shows that although on average the unit cost required is higher than our assumptions of costs required, it is possible for schemes of this size to be less costly.*
4. *Increasing unit cost per p.e. capacity enhancement is persuasive for PR14 data, but WSX themselves acknowledge that this data includes inefficiencies. Going forward, in PR19 they have managed to reduce these inefficiencies (Figure 4-3).”*[23]

We do not agree with statement (1) that the evidence presented in section 4 helps to rebut the claim that DWF schemes exhibit strong economies of scale. The evidence presented in

[23] Text from “Further Analysis” box, within tab WSX-WWN802001, within file FM_CAC_WSX_IAP

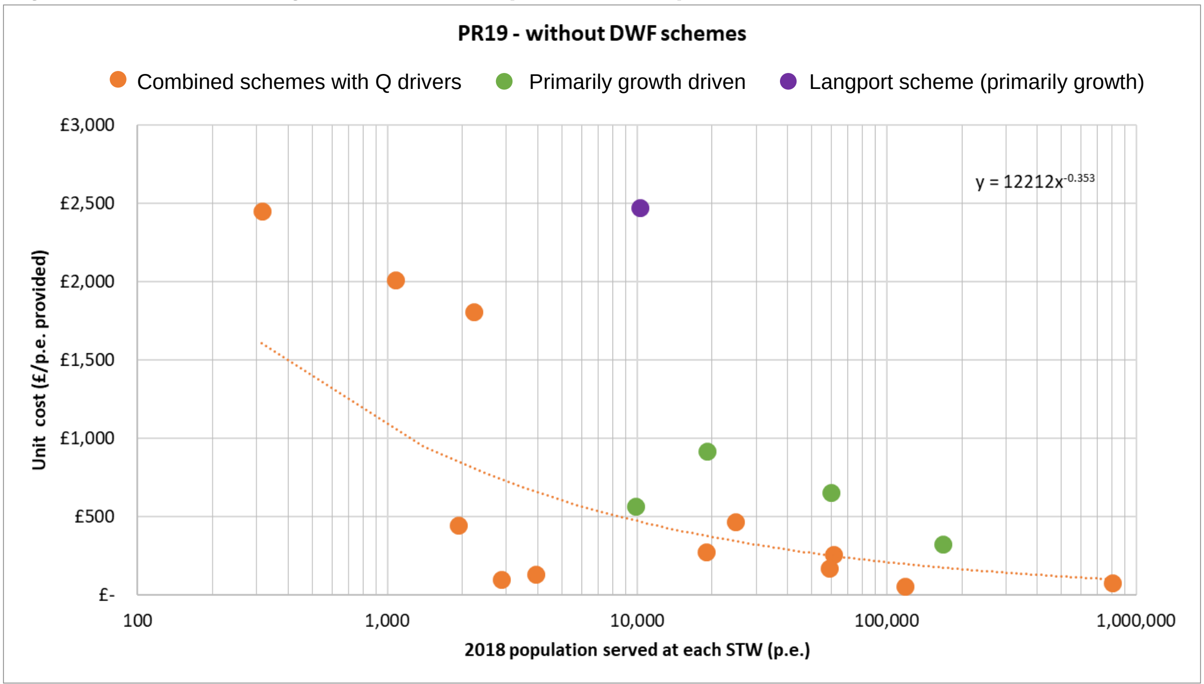
section 4 illustrates strong economies of scale which reinforces our claim rather than rebuts it.

Statement (2) claims that our plot of schemes excluding DWF schemes aids in this rebuttal. Statement (3) refers to the schemes that are below the line, implying that, as it is possible for some schemes to be less costly, these efficiencies could be applied to all schemes. This is an incorrect assumption; it is inherent in producing a line of best fit to a data set that there should be a similar number of data points above and below the line. Those schemes below the line are less costly as they have combined drivers with quality schemes as the primary driver. As previously discussed, although Wessex Water have a collaborative relationship with the EA and have worked together to include the best WINEP drivers for to meet the desired environmental outcomes, we cannot restrict investment in capacity enhancement solely to those sites at which there is also an environmental enhancement need. We are prudent in our approach to assessing the needs and requirements for investment in STW capacity due to growth and must invest at STWs where there is a real need for enhancement to ensure we maintain compliance with our environmental permits. The locations of these STWs are largely outside of management control.

Given the comments within statement (4), which refers to figure 4-3 in our submission, we believe Ofwat are in fact referring to figure 6-3 in our submission. Figure 6-3 illustrates unit costs for both PR14 and PR19 schemes. Statement (4) claims that we have acknowledged we were inefficient in PR14 and that we have overcome this in PR19. We have not acknowledged that we were inefficient in PR14. Rather we stated in our submission (*Appendix 8.6.A*, section 6.3.1), further efficiencies have been realised in our PR19 schemes "*largely due to the synergies for schemes with a primary driver in FFT*". Efficiencies realised in PR14 were for those growth schemes with combined drivers. The further gains in efficiency for combined schemes in PR19 are greater overall due to the number of combined schemes, particularly the FFT drivers (a new WINEP driver not included in PR14). As described in Appendix 4 (IAP response) an FFT driven scheme requires an increase to a STW's hydraulic capacity which in turn provides treatment capacity. The funding of the FFT schemes within the WINEP is for flow capacity up to 2025. The growth element of these combined schemes is to provide additional treatment capacity to a longer design horizon to ensure long-term efficiencies in capacity enhancement are realised.

To illustrate which of our growth schemes have a primary driver being quality (WINEP) or growth, Figure 3-3 has been repeated below in Figure 3-5, but with identifying colours.

Figure 3-5: PR19 STW growth schemes (without DWF) - with drivers



In Figure 3-5 all the schemes that lie above the line of best fit have their primary driver (50% or greater) attributed to growth. This highlights the higher unit costs of these schemes due to limited or no linkage with quality drivers.

The purple data point represents Langport STW (refer to Annex B within our submission for further detail), which although a combined scheme, is still primarily driven by growth and in particular increased ammonia load from trade discharges from an abattoir within the catchment. This is an abnormally high increase in ammonia load compared to an equivalent residential increase in population and requires investment in tertiary treatment to manage this increase rather than a simple capacity enhancement.

The quality element of the scheme is phosphorous removal and whilst some synergies in tertiary treatment required could be realised for tight phosphorous limits and ammonia treatment, as the phosphorous limit is 1 mg/L, tertiary treatment is not required for this level of phosphorous removal. Thus the tertiary treatment required for enhanced ammonia removal is only required for the growth element of the scheme and as such only small efficiencies can be realised through coincident construction periods.

3.7 Suggested action for Ofwat

For the reasons presented within this response we believe our cost adjustment claim for STW growth is valid and Ofwat should review their assessment of this claim.

4 New development wastewater schemes

Business plan table and Line ref: Table WWS2 Lines 25 and 72.

In our submission *Supporting document 5.7 – Accommodating growth and new development*, we listed wastewater network schemes that we named as defined schemes, defined contingent schemes, characterisation and adoption of new sustainable drainage.

In the following sections we provide further evidence confirming the need for investment.

4.1 Ofwat model

Ofwat's growth model is discussed in Section 2 above. The lumps three areas of sewerage (STW enhancement, sewerage enhancement and sewer flooding investment) into one model and uses a triangulation model to relate it against historical and forecast population growth. We consider that the Ofwat growth model is not suitable for applying to both sewer flooding and the new development wastewater schemes. This is because the model does not consider available headroom is the sewerage network. It is too simplistic, and we recommend that rather than using a model, a bottom up approach is required.

We also describe comments to the growth model in our IAP response to the flooding in Appendix 7 *Minimising sewer flooding*, Section 2. This shows that the model includes our costs for many aspects that are not related to new connections.

Ofwat's IAP model allocation would result in a 32% reduction in our proposed growth investment. This will reduce proposed capex for wastewater network schemes from £38.8m to £26.0m. If all development continues as we currently understand it, the IAP allowance would not provide sufficient funding to cover the efficient costs fulfilling our statutory duty of expanding our network to accommodate development.

The model does not reflect the lack of headroom in the existing sewer networks. This lack of headroom could be because of urban creep, climate change and the cumulative effect of historical development or expansion of the conurbations.

Where our existing sewers do not have available headroom, any new development will make the existing flooding problems worse and these will flood more frequently in the future. We receive many complaints from residents worried about new development putting extra pressures on the ageing sewerage infrastructure.

This can be significantly important if surface water is allowed to connect into the foul/combined sewers. We have a policy against this, but the developers have the right to connect - like for like sewer pipe diameter size. As a last resort surface water can enter foul sewers.

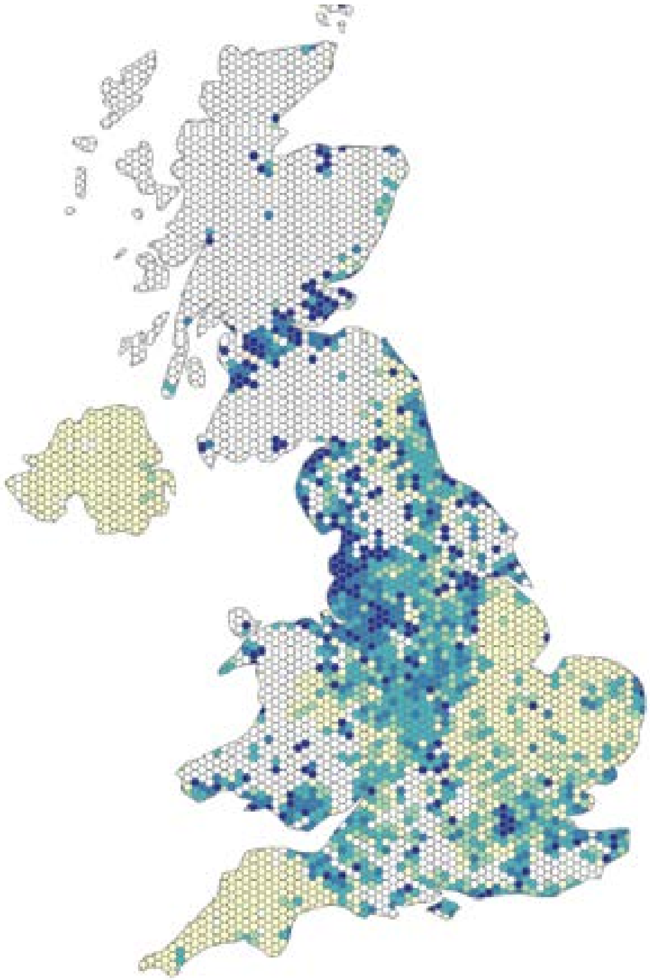
The 21st Century Drainage programme developed a 'national picture' of capacity attempted to show headroom. This is shown in Figure 4-1 below.

This is a complicated concept– we have provided this here to show how complicated headroom in the network is. And we are not going to explain the detailed narrative of what it means. However, we understand that Ofwat's model cannot go anywhere near this level of complexity.

We consider that a bottom up approach to new development and flooding in sewer network is more appropriate approach to setting investment levels. For example a development of 1000 houses proposed in one catchment could have an enormous flood risk is it was proposed on the outskirts of the catchment at the furthest point away from the STW, but if the 1000 houses were being built close to the STW then it could have negligible impact.

New development and flooding have to be considered using a bottom up approach.

Figure 4-1: National picture of headroom



To incentivise new development to be sustainably drained, we have set a very low infrastructure charge for foul only connections (at only 10% of the standard charge) - a current charge of only £19 per property. This will not fund network reinforcement, but because the new flows in theory are foul only, then network reinforcement will be less likely to be needed. We know however, that notionally separately drained foul only sewers do respond to rainfall due to misconnections. A 50% reduction applies if flows are attenuated by a sustainable system.

Like our flooding programme (see Appendix 7, section 3) we have a view of long-term planning for supply demand balance programme to accommodate development by expanding and reinforcing our sewer network. If all prospective developments that we know about were built, we estimate an investment of over £500m would be required to extend the network. However, this will be spread over the next several decades. We are developing

Drainage and wastewater management plans (see Appendix 7, section 4) which will develop strategies including future growth investment needs.

4.2 Need for investment

The need for investment was evidenced in Document 5.7- *Accommodating growth and new development of the September business plan submission*. This described the most likely schemes that would need to be constructed in AMP7, for different developments using a likelihood chance of investment being needed in AMP7. We development has started or is imminent then these were classified as Defined schemes. There are also many other defined contingent and sewer requisition schemes that are in progress, many of which will need constructing, as shown in Table 4-1. The appraisals of these schemes are at various stages in the design process.

Table 4-1: Supply demand balance scheme locations

Defined schemes			**£17.1m**
Bristol (harry Stoke)	Corsham	Gillingham	Taunton
Trowbridge	Weston-s-Mare		
Defined contingent schemes			**£12.1m**
Charfield	Highbridge	Burnham	Fordingbridge
Minehead	Poole	Wool	
Bradford on Avon	Bridport	Brimsmore	Chard
Buckover	Keynsham	Nailsea	
Developer enquiries (characterisation)			**£5.4m**
Avonmouth	Bath	Berkeley	Bridgwater
Calne	Charfield	Chippenham	Christchurch
Clutton	Devizes	Falfield	Malmesbury
Melksham	Midsomer Norton	Paulton	Radstock
Salisbury	Shaftesbury	Shepton Mallett	Tetbury
Warminster	Wellington		
Sustainable drainage			**£4.2m**
As described in detail in Document 5.7, Section 3.6.3, pages 24-28.			

Further evidence of the significant increase in growth in our area and need for investment is given for two catchments below.

4.2.1 Corsham

Supporting document 5.7, section 3.6.1, gave background for the need for a major defined scheme in Corsham.

In the last year Wessex Water has been in consultation with Wiltshire Council regarding the Local Plan review and the allocation of a further 13,250 houses in the Chippenham Housing Market Area up to 2036, of which Corsham forms a part.

The Corsham Neighbourhood Plan notes that Corsham has witnessed substantial growth in recent years with the town already on track to exceed its indicative requirement for housing to 2026.

In the last year an additional site has been promoted through the development management process. Land South of Westwells road, between Rowan Lane & Jaggards Lane, Neston , Corsham is for 95 dwellings and if approved will add further stress to the Corsham foul sewer network.

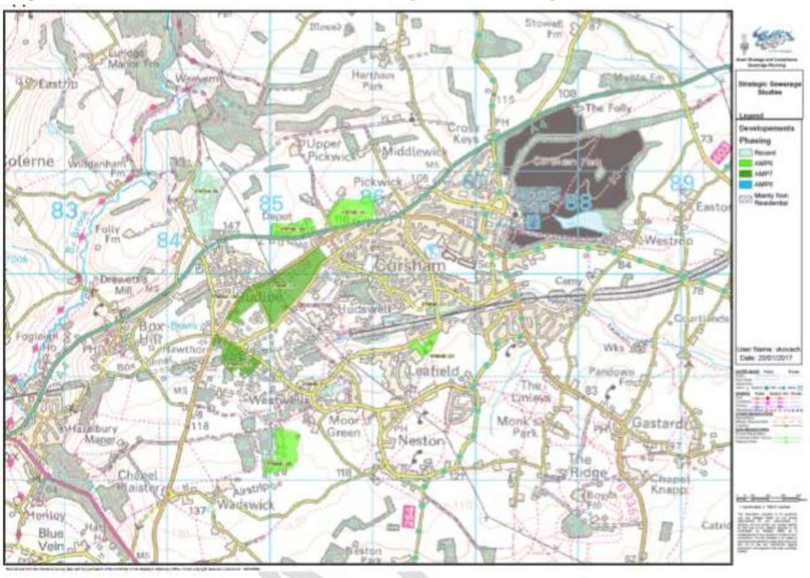
Corsham is home to the MOD Basil Barracks which employs circa 2,000 staff. Due to a change in strategy and ongoing security review the MOD is replacing contract civilian staff with permanent MOD civilian employees. Anecdotally this change is likely to generate more housing demand as permanent employees seek to establish roots.

Whilst some regions have local plan sites which have not been taken forward the majority of Corsham residential sites are under construction.

A recent article in the Sunday Times "Living in Corsham: the unspoilt Poldark location is a period delight"[24] promotes the area as a hot place to live "Local estate agents report that buyers are moving from Bath and Bristol, not only to get more house for their money, but also to find a friendly community where they can walk everywhere."

Investment in infrastructure for this growing town, including the sewerage network, is crucial.

Figure 4-1: Corsham recent and planned expansion



[24] Sunday Times "Going Places" March 3 2019

4.2.2 Weston Super Mare

Supporting document 5.7, section 3.6.1 gave background for the need for a major defined scheme in Weston Super Mare.

In the last year, since writing this, an application for 223 homes has been approved (17/P/5586/ reserved matters) and discharge of conditions application submitted for Parklands Phase 3.

North Somerset Annual Monitoring Reports for 2016/7 and 2017/8 report 268 and 247 completions respectively at Weston Villages. North Somerset's Large Sites Trajectory 2017 predicts only 171 completions for the year 2017/8.

Winterstoke and Parklands Villages form part of the Junction 21 Enterprise Area, the promotional literature for the Enterprise Area boasts:

> "Positioned alongside the M5 corridor, Junction 21 is strategically located at the access points to the South West and South Wales being 20 minutes' south of Bristol in close proximity to a deep-water port and international Airport.
>
> On completion, the Enterprise Area will provide over 2 million square foot of commercial space, 10,000 jobs and 6,000 new homes by 2026. Junction 21 Enterprise Area is part of the wider £1bn expansion and regeneration of Weston.
>
> £90m has been invested to date in developing c.30 Ha of Junction 21 Enterprise Area to date through a mix of public and private investment from Persimmon Homes, Homes England, St Modwen, Dowlas Developments Ltd, Landmore Developments, Mead Realisations, Abbey Manor Group and North Somerset Council – many of these forming a strategic joint marketing and delivery group for Junction 21 Enterprise Area."[25]

Wessex Water has worked with North Somerset Council in contributing to the surface water scheme to facilitate the development (Weston super pond). We have also worked together to promote equitable schemes of diversion and installation of sewers to match the construction of the new North/South Link Road serving the Weston Villages. Construction of the £13 million Link Road Scheme has commenced and is due to be completed in April 2020.

A robust sewer network scheme is required to serve the new Weston Super Mare villages which are being constructed at a faster rate than anticipated.

4.3 Suggested action for Ofwat

In conclusion, we consider that the Ofwat model is too simplistic for the complex nature of new development impact on the sewerage system. We recommend that our bottom up approach is used. For each of the named defined, defined contingent and developer enquiry schemes we have engineering appraisals, including computer modelling and costed estimates, to evidence the bottom up approach. We can provide these if Ofwat need more evidence.

[25] http://www.j21.co.uk/#map

5 First time sewerage

Business plan table and Line ref: Table WWS2 Lines 1 and 48.

In our PR19 submission *Supporting document 5.7 – Accommodating growth and new development,* we described the first time sewerage programme, as it was understood just prior to submission of our business plan in September 2018.

This section discusses Ofwat's IAP model and provides further evidence, including information about recent first time sewerage (FTS) applications.

5.1 Ofwat's model and recent FTS changes

Ofwat's IAP model is based on historical and forecast investment costs and a cost driver of the number of connectable properties served by s101A schemes (table WWn3 line 1), which seems to be a reasonable approach. However since submission of our business plan we have received a new first time sewerage application, which is likely to be viable and will require construction in the next five years. Thus the forecast number of connectable properties over the five year period is likely to increase.

Our submission included £5.3m for first time sewerage. Ofwat's IAP cost model allows £3.8m.

Given the recent application, the IAP allowance will not be enough to meet our duty under section 101a under the Water Industry Act.

Our first time sewerage submission costs was summarised in Table 3-4 in Document 5.7 in our September submission, duplicated below:

Table 3-4: First time sewerage investment

First time sewerage	Capex (£m)
Witchampton	1.2
Leigh Road Bradford on Avon	0.4
Viability studies	0.5
Newly arising schemes	3.2
Total	5.3

The number of connectable properties was based on Witchampton 19, Leigh Road 6 and 20 for newly arising schemes, to give a total of 45 over the five years.

Since our submission in September 2018 we have continued our AMP6 s101a FTS viability studies, which we aim to turn around within six months. One scheme appears to have a viable public solution and another scheme could be viable. The estimated cost of the viable scheme exceeds the £3.2m we allowed for newly arising schemes in our proposals.

These potential schemes are summarised along with the other named FTS schemes in the following section.

5.2 First time sewerage schemes

5.2.1 Witchampton

We are currently designing the Witchampton scheme, for delivery early in AMP7 but have come across difficulties. The land owner of the proposed location for a new soakaway system is refusing land entry. We have therefore not been able to prove if a soakaway system is viable. We are currently undertaking site investigations in a nearby road, to provide an indicative surrogate. To build the scheme we may need a compulsory purchase order of the land.

We are therefore considering alternative solutions like a new sewage treatment works in a different location that discharges to the river, rather than to a local soakaway.

This scheme is likely to cost more than the estimated £1.2m. If we recalculate the viability score, then this scheme may become non-viable.

5.2.2 Beanacre

We received an application from 60 residents in the hamlet of Beanacre, Wiltshire in June 2018. Our viability assessment shows there is evidence of pollution in the watercourse through this hamlet, as shown in Figure 5-1, which shows evidence of pollution with sewage fungus. There was a strong smell of sewerage and the brook had a dissolved oxygen of 10% and an ammonia concentration of 10 mg/l.

Figure 5-1: Private septic tanks causing pollution in Beanacre

The Environment Agency is aware of the issues in Beanacre and would welcome a FTS scheme, as quoted below:

> *So, in conclusion we would view the problems caused by the existing private drainage arrangements in Beanacre as significant and would welcome a first-time sewerage scheme for the village*

We are currently appraising two areas: one addressing the applicants only (Area 1) and a second larger area serving the entire hamlet (Area 2). For both we have considered pumping south (option 1), pumping west (option 2) and providing a new sewage treatment works (options 3 and 4). Both options of pumping flows to Melksham to the south appear to be viable. The options for a STW are over twice as expensive and are not viable.

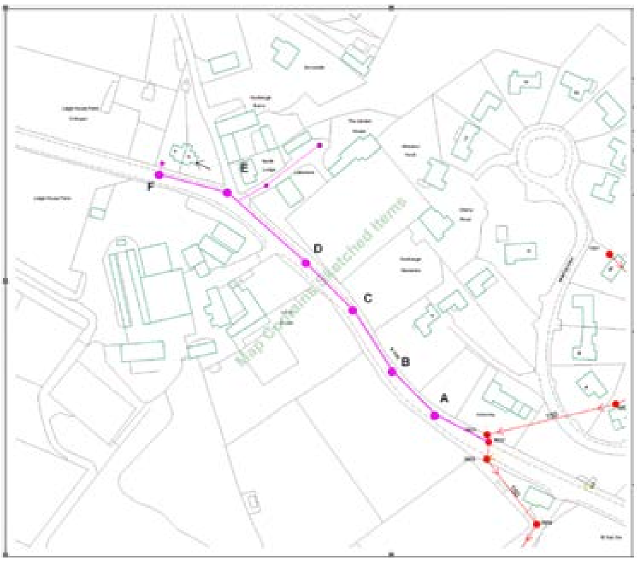
The cost estimate for Area 1 (option 1) is £2.6 to £3.2m and has an *initial* viability score of 1.3. The cost estimate for Area 2 (option 2) is £3.1 to £3.8m and has an *initial* viability score of 1.3.

Viability scores greater than 1 suggest that a public scheme is viable and should proceed to the next stage of design. These are initial viability scores only and we are not in a position to commit to deliver these schemes until the appraisals are more complete.

5.2.3 Leigh Road, Bradford on Avon

This is a small scheme Wessex Water are committed to deliver in AMP7.

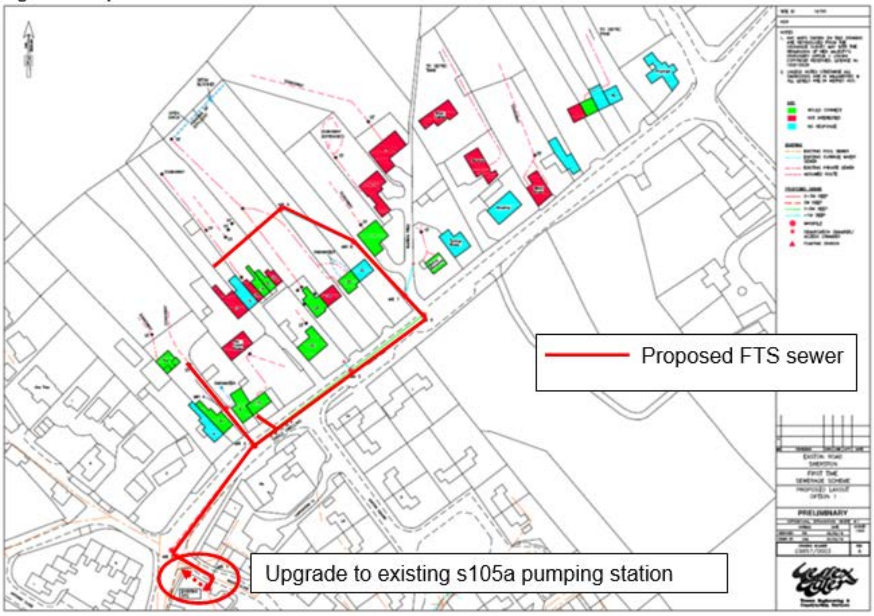
Figure 5-2: Leigh Road FTS proposal



5.2.4 Easton Road

This is a potential medium sized scheme, with the initial viability study suggesting a new gravity sewer discharging to an upgraded pumping station. However, further investigation has raised buildability issues and a topographical survey suggest that another pumping station will be required. The viability of this scheme is still being assessed and is probably not going to be viable to connect to the public system.

Figure 5-3: Easton Road FTS initial option



5.3 Discussion

Recent FTS applications have been for small schemes, with low numbers of properties, hence the modest level of investment proposed in our plan.

As mentioned above we have recently receive a large application for 60 properties in Beanacre. However, the scheme is not confirmed so we have not changed the data tables at the present time. If the scheme is confirmed our forecast for the total number of connectable properties would increase to around 85 to 105 over the period. This data should be available by July 2019.

This increase in applications could be due to change in government strategy - the Environment Agency has recently published on the government website[26] advice that some private assets will need to be upgraded (read the binding rules here).

The recently received application at Beanacre near Melksham is for an area of 60 properties, with many of the private drainage systems causing a visible polluting problem. However, although it appears likely that it will be viable, the Beanacre scheme has not been through the full viability assessment and our governance process, so we have not changed the explanatory variables data table to include it.

By the time of the draft determination we will have further information to support the case for increasing the number of properties to be connected by first time sewerage schemes.

5.4 Suggested action for Ofwat

We would request Ofwat note that we will have more information in order to confirm the estimate of the number of connectable properties at draft determination stage.

[26] https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-the-ground