

Annual performance report 2021/22

Supplementary Information Appendix



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Leakage and Per Capita Consumption Convergence and Backcasting

Methodology convergence

During 2021/22 we have completed actions to move to fully convergent with the sector common leakage and PCC methodologies. This has now allowed us to fully backcast years 2017/18, 2018/19 and 2019/20 in order to set a fully convergent baseline for AMP7 reporting. We have also backcast 2020/21 which enables us to present a fully convergent year 1 performance level alongside our year 2 (2021/22) performance level.

The main outstanding action last year was for our non-household night use logging and metering. During 2020 and 2021 we had installed meters but the Covid impacts had prevented us from fully completing this programme. The knock on effect of this was lower coverage, and therefore a smaller data set than we required, leading to some uncertainty in the results being obtained when the data was modelled. Therefore, for last year, we reverted to our previous methodology. We have now completed this programme in full and have obtained a data set sufficient for modelling. As time now passes, we will be able to build up this data set further.

The actions we have completed to move to fully convergent will mean the backcasted performance values we now present are final and will not need to be backcast again in the future.

Whilst we are fully convergent in terms of process against the common methodology, in 2021/22 we have a water balance gap that is above the 2% threshold in the SST region. This is due to two main factors, residential meter reading lag and business meters not read for a year or more.

For residential customers, our annual meter reading frequency in the SST region means that there is a lag between changes in consumption in real time and seeing this consumption coming through in our systems and water balance. When consumption is relatively stable this impact is immaterial, but during the past two years residential consumption has been through a material step change and will take time to stabilise, although it should also be noted our overall DI remains elevated into 2022/23 so residential consumption has not yet returned to pre-Covid levels. In the CAM region meters are read twice-yearly and so the lag is less pronounced, however there was also a different pattern seen in terms of how DI has changed during Covid with the step change overall being less extreme than in the SST region. We believe that our regional location plays a significant part in this, as our SST area is close commuter belt to Birmingham and Wolverhampton however both of these cities are in Severn Trent's supply area. We therefore think that we have a residual working from home influence on our residential consumption that is not being offset by a reduction in business use in our own supply area.

For business customers, we still have a residual number of meters that have not been read for a year or more by the market retailers. This has reduced from last year, when over 8,000 meters were unread, down to around 4,000 this year. However this is still a considerable proportion of businesses where no reading was available.

The water balance process is designed to accommodate a gap by spreading it over all water balance components, therefore we will not need to restate any values in future as a result of this issue.

Backcasting impacts

We are providing restated values for leakage and PCC from 2017/18 onwards which are now fully consistent and inclusive of all convergence factors that will influence these numbers. We do not expect to restate values again in the future, and these values can now reliably form the basis for our AMP7 performance commitments. These restatements impact upon the calculated incentive values for 2020/21, which we set out below alongside the incentive position for 2021/22.

The foundation of the calculated 3-year-average leakage and PCC baselines, and the 3-year-average performance level used to calculate incentives, are the annual performance values for each year. Table 1 shows the full set of annual performance values pre- and post- backcasting. Tables 2 through 5 below show the 3 year averages and resulting incentives for each region's leakage and PCC performance.

Table 1: full set of pre- and post- backcasting annual leakage and PCC values

Pre-backcasting	2017/18	2018/19	2019/20	2020/21	2021/22
SST region annual leakage (MI/d)	72.3	69.9	64.7	65.5	n/a
CAM region annual leakage (MI/d)	14.3	14.9	14.3	12.5	n/a
SST region annual PCC (l/p/d)	129.0	133.2	128.4	151.6	n/a
CAM region annual PCC (l/p/d)	138.5	140.4	128.2	150.8	n/a
Post-backcasting	2017/18	2018/19	2019/20	2020/21	2021/22
SST region annual leakage (MI/d)	75.6	73.4	68.3	68.8	67.4
CAM region annual leakage (MI/d)	15.6	16.2	15.0	13.1	12.5
SST region annual PCC (l/p/d)	127.4	131.5	127.0	150.0	148.8
CAM region annual PCC (l/p/d)	137.4	140.0	127.0	150.4	141.0

Note that our estimate of leakage has increased in both regions as a result of backcasting. This is a consequence of our improved non-household night use data, which showed a lower night use than our previous model, therefore increasing our estimate of leakage. The reductions in PCC are a combination of two factors. First, a consequence of the influence from the non-household night use estimate on unmeasured PHC; and second, post MLE impacts resulting from alterations in other water balance components.

Table 2: SST region leakage restatement impact on baselines and incentives

	3ya Baseline MI/d	2020/21 3ya actual MI/d	2020/21 % change	2020/21 incentive £m	2021/22 3ya actual MI/d	2021/22 % change	2021/22 incentive £m
Pre-backcast	69.0	66.7	3.3	0.216	n/a	n/a	n/a
Post-backcast	72.4	70.2	3.0	0.176	68.2	5.8	0.235

In 2020/21 APR we reported, and were allowed, an outperformance payment of £0.216m. The table shows this needs to be adjusted down to £0.176m. We have reflected this change in our submitted in-period adjustments model for 2021/22, with a negative £0.04m adjustment in row reference IPD04_CO_IN_32. For the 2021/22 year, an outperformance payment of £0.235m has been reported.

Table 3: CAM region leakage restatement impact on baselines and incentives

	3ya Baseline MI/d	2020/21 3ya actual MI/d	2020/21 % change	2020/21 incentive £m	2021/22 3ya actual MI/d	2021/22 % change	2021/22 incentive £m
Pre-backcast	14.5	13.9	4.1	0.042	n/a	n/a	n/a
Post-backcast	15.6	14.8	5.1	0.063	13.5	13.5	0.190

In 2020/21 we reported an outperformance payment of £0.042m but we elected to defer this due to the remaining uncertainty on the impact of updating models in this region. Post-backcasting the 2020/21 outperformance payment should be £0.063m. We have reflected this change in our submitted in-period adjustments model for 2021/22 with a positive £0.021m adjustment in row reference IPD04_CO_IN_32. For the 2021/222 year, an outperformance payment of £0.190m has been reported.

Table 4: SST region PCC restatement impact on baselines and incentives

	3ya Baseline MI/d	2020/21 3ya actual MI/d	2020/21 % change	2020/21 incentive £m	2021/22 3ya actual MI/d	2021/22 % change	2021/22 incentive £m
Pre-backcast	130.2	137.7	-5.8	-1.352	n/a	n/a	n/a
Post-backcast	128.6	136.2	-5.9	-1.369	141.9	-10.3	-2.355

PCC incentives have been moved to end-of-period as a result of the impact of Covid on residential consumption. In 2020/21 we reported an underperformance payment of £1.352m, and post-backcasting this is updated to £1.369m. For 2021/22 a further underperformance payment of £2.355m has been accrued.

Table 5: CAM region PCC restatement impact on baselines and incentives

	3ya Baseline MI/d	2020/21 3ya actual MI/d	2020/21 % change	2020/21 incentive £m	2021/22 3ya actual MI/d	2021/22 % change	2021/22 incentive £m
Pre-backcast	135.7	139.8	-3.0	-0.143	n/a	n/a	n/a
Post-backcast	134.8	139.1	-3.2	-0.148	139.5	-3.5	-0.202

PCC incentives have been moved to end-of-period as a result of the impact of Covid on residential consumption. In 2020/21 we reported an underperformance payment of £0.143m, and post-backcasting this is updated to £0.148m. For 2021/22 a further underperformance payment of £0.202m has been accrued.

Per Capita Consumption Improvement Activity

Background

Per Capita Consumption (PCC) is a measure of the average water consumption per person, measured in litres per person per day. At PR19 companies were set reduction targets aligned with their water resource plan proposals and wider aspirations, and taking into account Ofwat's view of required water consumption reductions over time. This was based on historical data and future forecasts at 2018/19 and earlier. However in March 2020, the sudden impacts of the Covid pandemic meant that many businesses closed down or were operating reduced services, and many households found themselves at home instead of at work or school.

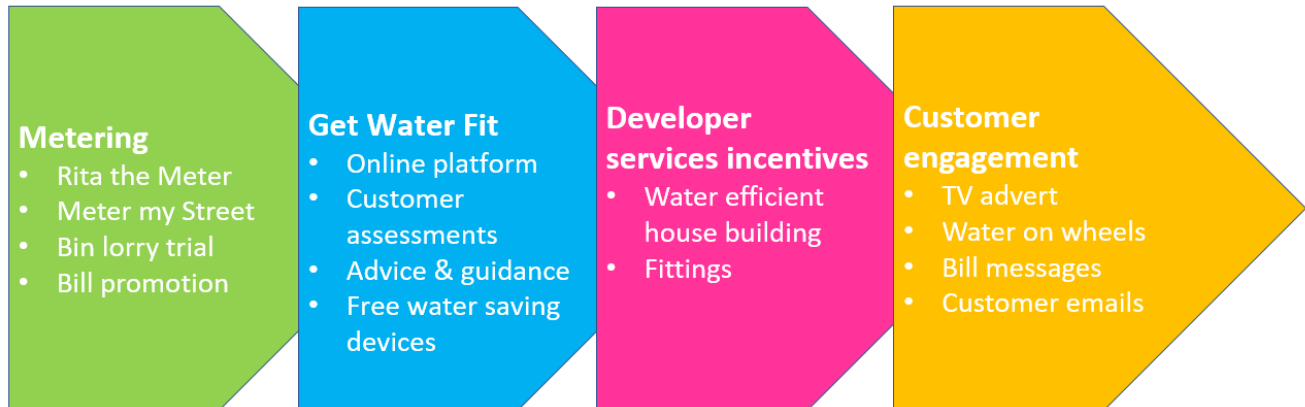
Across our two operating regions of South Staffs (SST) and Cambridge (CAM), we saw significant increases in residential water consumption, decreases in business consumption, and an overall net uplift in the volume of water consumed in total. Patterns were different in each region due to demographic factors, and the recovery has also been different in each region so far. However neither region has returned to the consumption profile from the pre-Covid years. We believe this is due to a residual working from home effect that has been enabled during Covid and proven to work well in many sectors. It remains to be seen whether this will slowly dissipate over time, returning to broadly pre-Covid profiles, or will remain viable and preferred into the future.

The new levels of PCC are significant not only in terms of the step change in behaviour that has occurred and may persist, but also because of the impact on targets set at PR19 before the pandemic occurred. Prior to the pandemic, targets were set which aimed for a percentage reduction from a baseline of around 1% in SST region and about 6% in CAM region. This was based on programmes such as metering, water efficiency improvements in homes and general trends in technology (appliance) improvement, and water efficiency activity carried out proactively by us in our role as a water provider. Water companies are one of many stakeholders that can influence PCC but longer term reduction aspirations identified nationally will require a national effort and certainly changes to building regulations for new homes, and improvements in product labelling as well as other factors such as an increasing recognition of water scarcity within the general population. We are one stakeholder in this but to achieve long term aspirations requires a collaborative approach across other sectors including Government support and actions.

However, the current levels of PCC are significantly in excess of the pre-Covid baselines for PCC targets set at PR19. Because of this, we are currently incurring significant ODI penalties on PCC measures in both regions. At present, Ofwat has deferred PCC penalties to end of period reconciliation – in practice this means that the evidence case will be reviewed as part of PR24. We remain strongly of the view that the unprecedented impacts of the Covid pandemic on water consumption, and the potential for persistent customer behavioural change as a result (predominantly working from home) means that the pre-Covid PCC values are no longer suitable to be used as a baseline for PR19 targets.

However, despite the significant impacts on PCC, we have continued with our extensive water efficiency and customer messaging programmes to try and influence domestic consumption. The following graphics show the activity we have been doing. Unfortunately, at the moment the impacts of Covid means that we cannot yet determine the impacts of these efforts in our PCC values, as overall PCC levels are still significantly impacted by the structural step-changes that have occurred. We expect it to take considerable time to re-establish a reliable baseline and trend because the scale of the step-change and the reasons behind it are so significant.

What we're doing...



This graphic shows a summary overview of our PCC improvement activity. We have a range of campaigns, some of which are branded to help draw in customer attention (for example our 'Rita the Meter' brand for our meter optant programme). We also offer advice and free water saving devices for customers via our Get Water Fit service.



We've carried on pushing our offering to developers too through an incentive programme, and we have a performance commitment (water efficient housebuilding) which we've beaten our targets on for 2020/21 and 2021/22.

And we've embarked on several customer focussed promotional campaigns (details on the following pages) which, for the first time for our company, included a TV advert.

Our customer engagement strategy is in five overall parts:

1 Mass communication



Summer Campaign – education of water behaviour

Life's sweeter on a meter – 2 year switch back guarantee

Metering campaigns – written, social, email, SMS, adverts, contact centre drive, website advice, community engagement

MP engagement – sharing a view of communication

Education – KS2 & KS3 activity for primary and secondary school ages

Waste not, one drop – TV advert

2 Community campaigns



Here for you – affordability support and metering driver

Water on wheels – CAM presence reaching all customers in our community

Care Leavers Covenant – working with young adults leaving the care system

In place of person – covid infographic boards

Stakeholder reach – updating on new initiatives through regular communication

Webpage improvements – Mapping water on wheels so customers have location visibility

Email campaigns – pre annual billing Here for you, static and planned engagement

3 Wonderfully Water... engagement plan

Mass Communication Community Campaigns Media / PR Stakeholders

CMEX alignment

4 Media & PR

Waste not one drop

Total Twitter reach: 9.3k ↑ 100%

Total Facebook reach: 4.1k ↑ 100%

- Waste not one drop – TV advert
- Education – KS2 & KS3 activity for primary and secondary school ages
- Social media advertising - low cost improves reach

CAM	SSW
Reach 31,408 81.3% of 38,651 target universe.	Reach 180,899 83.4% of 216,873 target universe.

Our TV advert can be viewed on our website: <https://www.south-staffs-water.co.uk/about-us/waste-not-one-drop>

Stakeholder engagement

Can you 'Get Water Fit' to win a £100 voucher?



Our customers
in our hands
CMEX • DMEX • RMEEX

External community organisations

Housing associations

Get Water Fit

Internal campaigns – contact centre drivers

All teams – 'Our customer comms

Third party campaign support – Water wise

For this year we have expanded our marketing activity in this area with even larger media and customer communications programme. We're also looking at linking it in with our vulnerable customers to provide additional and targeted support for example repair of leaky loos and purchase of water efficient white goods. We are looking to increase our resource in the community to share the messages wider and connect with community and faith leaders in our more harder to reach communities to better identify the relationship with water customers in these areas have and how we can best influence behaviours.

PCC Additional Work

- Disruptive multi-channel marketing campaign
 - 3D billboards
 - Standard billboards
 - Telephone box wrapping
 - Bus adverts
 - DAX personalised radio adverts
- Summer campaign TV advert
- Additional roles
 - Community engagement
 - Plumbers
- Link to charitable trust and vulnerable customer
- Attendance at wider range of community events e.g. Staffordshire County Show, Cambridge Big Weekend, Cambridge Folk Festival



We are also continuing to explore new initiatives so we can continue to help customers reduce their water use in future. Some examples of our future ideas are:

Future concepts...



Average Pumping Head

Introduction and background

In December 2021 Ofwat undertook a deep dive of sector average pumping head (APH) processes to determine the level of consistency in reporting between companies and the overall data quality. We welcomed the review as APH is a significant exogenous driver of pumping energy needs, driven by the physical layout of our supply area and pumping assets. We participated in the steering group for the project and cooperated in full with the deep dive reviews of our data and process.

The review demonstrated that we already have a high degree of telemetry coverage across our pumping processes.

The final report identified a number of areas across sector that should be improved. We have worked to address these for this reporting year and also committed to improve the commentary we provide on our reported APH data to improve the transparency of our data sources, processes and supporting engineering rationale for our reported APH figures.

Additional data quality information requested

In its letter dated 3rd May 2022, Ofwat asked companies to provide some additional data quality information alongside the APR values this year. The below information shows this additional data and narrative for each price control area.

Price control area:	Raw water abstraction			
% of APH derived from measured data	Our APH assessment for raw water transport is 100% derived from measured data. For volume, this is via either a dedicated abstraction flow meter or, if not available, a dual purpose DI meter. For lift, groundwater level data is taken either direct from telemetry or routine borehole 'dip' readings. Abstraction flowmeters and pressure instrumentation are part of a periodic maintenance and calibration programme.			
% of sites with measured volumes and/or lift	As above, 100% of sites have measured volumes and lift data, either from telemetry or from routine dip readings.			
Estimation methods applied (if any)	We acknowledge that where ground water levels are dip sampled, this will not be a day to day live view of levels as we would obtain from telemetry, however we do not expect this to be material over the course of a year as pumping water levels are relatively stable on average over time.			
Significant APH changes from the previous reporting year		2019/20	2020/21	2021/22
	Reported APH (m)	30.13	31.82	32.36
	Our raw water abstraction APH is increasing slightly over the three years above which is due to an increase in the volume being abstracted from borehole sites. Our demand has been higher since 2020 due to Covid increases in consumption which is a factor in the increasing raw water abstraction APH over the past two years. Environmental conditions can also be a factor, with ground water levels being related to water resource availability.			

Price control area:	Raw water transport								
% of APH derived from measured data	The majority of sites have no raw water transport function, and so register as zero APH in our assessment. For those sites with raw water transport, our assessment is 100% derived from measured data. For volume, this is via a dedicated flow meter for the site. For lift, we have suction and delivery pressure instrumentation which is either directly brought from telemetry into an automated calculation or manually reviewed from local instrumentation.								
% of sites with measured volumes and/or lift	As above, 100% of applicable sites have measured volumes and lift data, either direct from telemetry or via site instrumentation manual review.								
Estimation methods applied (if any)	Where we have made a manual review of site instrumentation, this will reflect a typical value rather than a live value. Whilst this approach cannot detect day to day variation, we do not expect this to be material as the trunk main route topography will be the main factor which influences APH, and this does not change over long periods of time.								
Significant APH changes from the previous reporting year	<table border="1"> <thead> <tr> <th></th> <th>2019/20</th> <th>2020/21</th> <th>2021/22</th> </tr> </thead> <tbody> <tr> <td>Reported APH (m)</td> <td>19.19</td> <td>21.53</td> <td>23.13</td> </tr> </tbody> </table> <p>Our raw water transport APH has been increasing over the past two years. This is due to the increased demand we have had due to Covid, which has required greater utilisation of our two large raw water transfers at Hampton Loade and Nethertown.</p>		2019/20	2020/21	2021/22	Reported APH (m)	19.19	21.53	23.13
	2019/20	2020/21	2021/22						
Reported APH (m)	19.19	21.53	23.13						

Price control area:	Water treatment								
% of APH derived from measured data	<p>Water treatment APH is the most difficult to assess in our view. Treatment processes are complex and often have a mix of processes which restrict flow to varying degrees. We have taken a pragmatic view of water treatment, only attributing treatment APH for sites which have complex treatment processes with flow restricting assets, such as pressure filters and vessels (for example nitrate removal plants). This means that we have assessed the majority of our simpler treatment sites as having zero treatment APH.</p> <p>All volumes are measured. The majority of lift data is static. We review lift data annually and do checks back to site data and measurements, and we have a process to capture changes within our capital investment delivery and production arenas. The treatment APH figure is small compared to the other price control areas.</p>								
% of sites with measured volumes and/or lift	As above, 100% of applicable sites have measured volume data, but most pressure data is estimated.								
Estimation methods applied (if any)	For estimated pressure data we predominantly do this by using measurements of the relative height between different assets on site and design specifications for head loss across pressure vessels, in combination with pump design specifications. This is brought together into an expert review of the site configuration.								
Significant APH changes from the previous reporting year	<table border="1"> <thead> <tr> <th></th> <th>2019/20</th> <th>2020/21</th> <th>2021/22</th> </tr> </thead> <tbody> <tr> <td>Reported APH (m)</td> <td>2.37</td> <td>2.54</td> <td>2.39</td> </tr> </tbody> </table> <p>Our water treatment APH has been stable. This reflects the situation that treatment processes do not change frequently, and that most sites do not have any treatment APH attributed.</p>		2019/20	2020/21	2021/22	Reported APH (m)	2.37	2.54	2.39
	2019/20	2020/21	2021/22						
Reported APH (m)	2.37	2.54	2.39						

Price control area:	Treated water distribution			
% of APH derived from measured data	Our APH assessment for treated water distribution is 100% derived from measured data. For volume, this is via the DI flowmeter. For lift, we have pressure instrumentation on pump suction and delivery, which either comes directly into telemetry systems or is available for manual review. DI flowmeters and pressure instrumentation are part of a periodic maintenance and calibration programme.			
% of sites with measured volumes and/or lift	As above, 100% of applicable sites have measured volumes and lift data, either direct from telemetry or via site instrumentation manual review.			
Estimation methods applied (if any)	None.			
Significant APH changes from the previous reporting year		2019/20	2020/21	2021/22
	Reported APH (m)	127.09	126.73	131.01
	Treated water APH is sensitive to the mix of sites used and particularly the utilisation of HL to meet recent elevated demands, and which we project to increase in future because of catchment pressures, climate change which lead to pressures on groundwater site utilisation (no deterioration). Our network is optimised weekly ensuring the highest efficiency levels are achieved in our pumping arrangements. Hampton Loade is a unique asset from our perspective, its size and lift means it has a very significant contribution to total APH. We explain this in more detail below.			

Engineering-based rationale for our APH values

For raw water abstraction, raw water transport and water treatment, we do not consider ourselves to have any unusual operating circumstances compared to the rest of the sector. However, for treated water distribution we have the highest average pumping head in the sector.

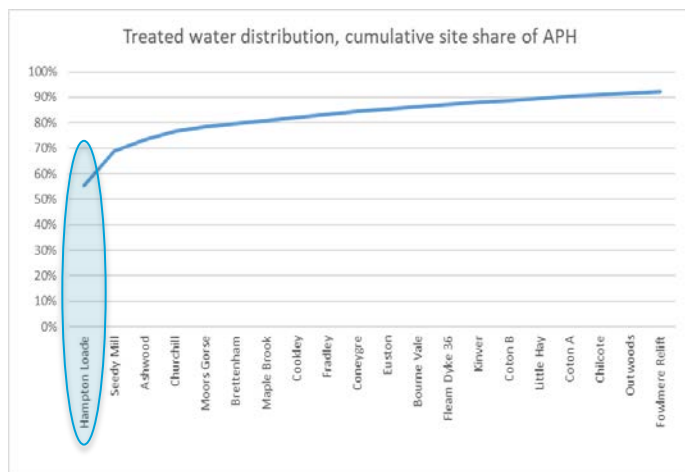
This is mainly due to the dominance of the Hampton Loade Water Treatment Works in the SST region. This is a surface water works located near Bridgnorth in Shropshire, which draws and treats water from the River Severn and pumps it to the densely populated regions of Wolverhampton, Dudley and Sandwell via a large strategic service reservoir located at Sedgley, West Midlands.

Hampton Loade is located at a height above sea level of 64m, and Sedgley is located at a height of 228m, a difference in static height of 164m. The 45" trunk mains between these sites run a total length of approximately 19 km, and incur some frictional pumping losses in this transfer. The delivery pumps at Hampton Loade are a total installation size of over 12 Megawatts (including standby). The lift and volume are directly measured via site flow and pressure instrumentation captured on a live basis via telemetry. Frictional losses in these trunk mains are greater at higher flow rates (which is also true across the whole network), which is why we see higher APH values when flow rates from the site are higher.

The output from the site is shared between ourselves and Severn Trent Water, via small exports located along the route of the trunk mains and a much larger export taken directly from the service reservoir at Sedgley. Note that in accordance with the APH guidance, we only account for the volume of water supplying our region in our APH calculation, with the Severn Trent export volume being excluded.

In 2021/22, Hampton Loade supplied around 36% of the demand of the SST region (29% of combined regions), and in future we are projecting this to increase further as the utilisation of the site increases

because of catchment pressures and climate change which leads to pressures on groundwater site utilisation (no deterioration). The remaining volume is supplied by another surface water works, Seedy Mill, located near Rugeley in Staffordshire, and a number of borehole sites located across the region. Our Cambridge region is 100% supplied by borehole sources. This large volume of water from a single source, when combined with the high elevation difference between the works and Sedgley reservoir, means that Hampton Loade alone takes a 55% share in the total treated water distribution APH of the combined SST and CAM regions, as shown in the below chart.



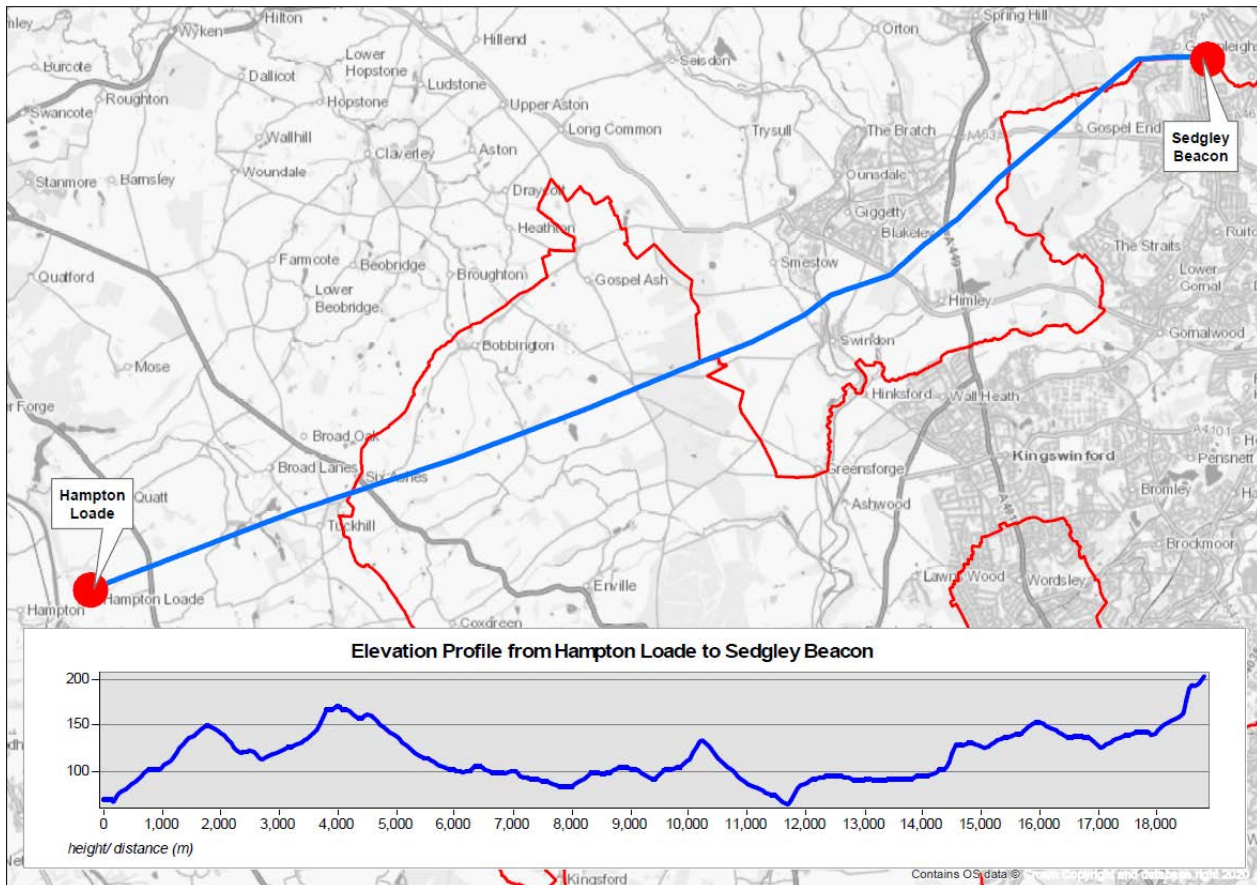
Hampton Loade alone takes a 55% share of combined treated water distribution APH.

Seedy Mill is another large volume surface water works, which also pumps to some significant elevated areas near to its location in Rugeley. Seedy Mill accounts for 14% of treated water distribution APH.

Over 90% of total treated water distribution APH derives from just 20 sites.

The remaining 113 sites included in our assessment account for less than 10% of APH. This shows why an asset count is not a reliable proxy for APH.

Hampton Loade alone is therefore a significant factor in explaining our high treated water distribution APH compared to the rest of the sector. This one site is providing a high proportion of water at a significant lift pressure. These factors cannot be changed due to the nature of the geography of the location of the source, the elevation of the reservoirs at Sedgley, and the route which the pipework has to take to reach our customer base. The diagram below shows the route of the trunk mains between Hampton Loade and Sedgley, and an elevation cross section of the route derived from our GIS system.



Ofwat will be aware that we are strongly supportive of including treated water distribution APH in the base cost models as there is a clear engineering rationale for its relationship with power costs. The above evidence shows why our treated water distribution APH value is high relative to the sector, and it is important that this exogenous factor is taken into account.

Visible Leak Repair Time

When defining our business plan our customers told us we should repair bursts quicker, to do our bit to minimise the wastage of water from our network. We agreed and set ourselves targets to significantly improve our performance in this area. During the business plan process we realised that the definition of the measure had been taken to include reinstatement time, which was not intended. We attempted to correct this with Ofwat post draft determination and post final determination. In a letter post final determination, Ofwat acknowledged that the definition should be amended however asked us to report the measure both with and without reinstatement time for the duration of the price control.

We have reported the value without reinstatement time, as originally intended, in table 3A. This is 90% of visible leaks repaired within 5 days, which meets our performance commitment. Including reinstatement, 90% of jobs are completed within 9 days.

Carbon Accounting

We have achieved our PR 19 PC carbon reduction target through a zero carbon electricity supply contract that will remain in place for the duration of the current AMP. However, having signed up to the water industry commitment to achieve net zero operational emissions by 2030.

Our approach to reducing Greenhouse Gas Emissions:

Strengths

- As a small company we're able to respond quickly to changes in circumstances;
- Our information systems provide us with a robust means of assessing our performance.

Weaknesses

- Our pumping head is one of the largest in the industry requiring similarly increased amounts of energy;
- As a water-only company we have no access to sewage treatment sludge from which we can generate biogas.

Opportunities

- We have identified a number of opportunities for the installation of renewable energy technologies.
- We are the first water company to operate major standby generation plant using HVO;
- The ongoing investment at our water treatment works affords the opportunity to introduce new and efficiency processes including ceramic membranes.

Threats

- Increased consumption as a result of changes in working practices amongst the population of our catchment has become evident in the last 12 months;
- As a water company whose local population is in part amongst the most deprived in the country we must balance investment carefully with the potential for additional cost;
- Impact of climate change on the availability of water resources is of concern in both South Staffs and Cambridge regions.