WSX09 - Annexes - Base cost adjustment claims

June 2023 early submission

Wessex Water
YTL GROUP

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CAC3 – Growth at Water Recycling Centres (WRCs)

This supporting document is part of Wessex Water's business plan for 2025-2030.

More information can be found at wessexwater.co.uk

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A1-1. Introduction and background

It is not clear how Ofwat will assess growth at Water Recycling Centres (WRCs) and, in particular, Dry Weather Flow (DWF) related costs, and therefore this high-level introductory claim has been prepared in the context of this uncertainty. The claim should be read alongside the appropriate data table entries, with costs as below:

Table 1: Growth at Water Recycling Centres - net value of claim

	2025/26	2026/27	2027/28	2028/29	2029/30	Total
CAC3 – Growth at Water Recycling Centres (WRCs)	£38.141m	£80.466m	£52.987m	£48.698m	£29.784m	£250.076m

In Ofwat's consultation on their proposed Econometric base cost models for PR24, they state:

> *"The main differences from PR19 are the exclusion of the following growth related costs from the base cost models at PR24.*
>
> - *Site-specific developer services costs – …*
> - *Growth at sewage treatment works costs – Arup concluded that a standalone econometric model may be a viable option for assessing these costs. We will continue to assess this. If a robust standalone cost model is not feasible, we may* revert to including growth at sewage treatment works costs in the base cost models. "[1]

Prior to AMP6, expenditure to increase capacity at WRCs driven by DWF and pro-rata tightening was funded under the Environment Agency's National Environment Programme (NEP) and allowances set against quality drivers. The growth models for PR19 and currently proposed for PR24 did/do not take into account this additional DWF quality expenditure in the historic data.

At time of submission of this claim there remains significant uncertainty regarding both the scope and scale of the Water Industry National Environmental Programme (WINEP) for AMP8. A number of sites we have identified for capacity provision have also been identified as requiring enhancements under the WINEP, particularly regarding nutrient and sanitary requirements at our WRCs. Many of the currently developed options and proposed improvements to WRC discharges have been superseded through the emergence of new legislation and/or changes to regulatory guidance. Costs will be purpose split as appropriate and in line with Ofwats' regulatory reporting guidelines.

Given the uncertainty regarding how Ofwat will assess growth at WRCs, as well as the WINEP still being in development, we reserve the right to amend/re-submit this claim. We plan to provide further supporting evidence to Ofwat's cost adjustment claim assessment criteria as part of our business plan submission for any partially or not addressed through this early submission.

[1] Ofwat (April 2023). Econometric_base_cost_models_for_PR24_final.pdf (ofwat.gov.uk)

A1-2. Need for adjustment

For each permitted site, the Environment Agency (EA) sets numeric discharge permit limits for the daily Dry Weather Flow (DWF) of treated sewage or other effluent that operators may discharge. The effluent quality limits are determined on the basis of the permitted DWF.

The underlying need for investment in capacity enhancement is population and trade effluent growth in specific catchments. If growth within a WRC catchment leads to the measured DWF exceeding this permitted DWF limit, then we are required to investigate the reasons for the exceedance and provide a report to the EA. Measured DWF flows do tend to vary from year to year due to e.g. weather conditions or groundwater levels, although a higher DWF limit must be applied for if, following investigation, the cause of the exceedance is due to:

- Growth of connected pop, or
- Long-term increase in existing trade effluent discharges, or
- New trade effluent discharge, or
- Connection of other drainage systems.

To prevent deterioration of the receiving watercourse, a higher DWF permit limit will necessitate an associated tightening of quality permit limits, such as for sanitary or nutrient parameters. If the tighter quality limits cannot be achieved at the respective WRC through the operation of existing assets, then investment is required for provision of advanced treatment even if the WRC otherwise has capacity to meet existing sanitary and nutrient permit conditions.

Prior to PR14, quality enhancement due to a growth-related DWF exceedance was funded under the National Environment Programme (NEP) as a 'prevent deterioration' driver. As with PR14 and PR19, under the Water Industry NEP (WINEP) for PR24, the EA no longer allows for prevent-deterioration funding for sites with a DWF exceedance (i.e. growth beyond the permit headroom).

The following statement outlines the EA's view on funding principles for DWF exceedance schemes:

> *"Investment required to 'prevent deterioration' to current permitted Dry Weather Flows (DWF) should be included in the WINEP under the prevent deterioration driver.*
>
> *Investment to accommodate growth beyond the permit headroom should not be included in the WINEP under the prevent deterioration driver, but should be included in water company business plans, as a supply demand scheme."*[2]

The WRC growth model for PR19 model and the proposed PR24 model use load as the key variable, however the load / population equivalent (PE) increase used includes the additional PE provided by the DWF quality driver (but not the expenditure against the quality driver), making historic growth allowances look more efficient on a £ per PE added basis than in reality.

[2] Environment Agency (September 2022). PR24 WINEP Driver Guidance – Prevent Deterioration

A1-2.1. Materiality

Our business plan totex for AMP8 is still under development, so we do not have figures to apply Ofwat's materiality thresholds. Nonetheless, on current evidence:

- Our claim of £250m exceeds, by a considerable margin, Ofwat's materiality thresholds in respect of the wastewater network plus price control.

A1-2.2. Adjustment to allowances (including implicit allowance)

As set out in the introduction section it is not clear how Ofwat will assess growth at Water Recycling Centres (WRCs) and, in particular, Dry Weather Flow (DWF) related costs. Given the proposed exclusion of growth-related costs from the PR24 models, we would expect the corresponding implicit allowance funded by the models to be zero.

A1-2.3. We are not proposing a symmetrical cost adjustment

We are not proposing that Ofwat make a symmetrical cost adjustment across the industry as part of this claim at this stage, as it is unclear if Ofwat will assessment this costs within the base econometric models.

A1-3. Cost efficiency

Capex estimates have been derived from a high level capex costing tool, informed/calibrated through representative bottom-up estimates, alongside estimates developed for PR24. These bottom-up estimates are produced by our in-house estimating team, who have extensive experience both with Wessex Water and as commercial estimators for contracting companies. In addition to their core estimating skills the team also have substantial technical and design skillsets which contribute to making sure that the scope of works is complete and buildable. Additional estimating support was provided by our procurement team, who have day to day responsibility for procuring goods and services.

Risk allowances are required to cover unforeseen scope development, ground conditions and other risks. Typical risks to project costs, in addition to scope development, that may not be known during early development include changes in:

- Planning permission and conditions
- Environmental protection and improvement measures
- Land purchase costs, loss of business claims and other 3rd party compensation
- Extensive service / utility issues
- Major operational constraints
- Ground conditions.

The change in site opex associated with the required enhancement is similarly derived from a high level opex costing tool, informed/calibrated through representative bottom-up estimates and actual site-based opex costs, alongside estimates developed for PR24 which includes engagement with suppliers for new process units.

We have employed ChandlerKBS – an independent specialist cost consultant – to produce estimates for a representative sample of the investment proposals. They have extensive experience in the water sector and have worked with a number of other water companies. We supplied them with project briefs, appraisal reports, scopes of works, M&E schedules and civil quantities where available. In all cases the cost consultants were asked to provide independent estimates without sight of our cost values.

A1-4. Need for investment

A1-4.1. Discharge permit compliance

Discharge permit compliance measures progress against the EA expectation to achieve 100 per cent compliance for all licences and permits, and reduced impact on the water environment. The detail behind the measure is given in the EA's Environmental Performance Assessment (EPA) Methodology.

Increases in flows to sewage works can result in tightened permit levels to prevent deterioration of the environment. WRC compliance is therefore an important indicator as to whether investment levels have been sufficient to meet the pressures of new development and urban creep.

The following table illustrates discharge permit compliance by English WaSC from 2011, with data sourced from the EA's annual EPA.

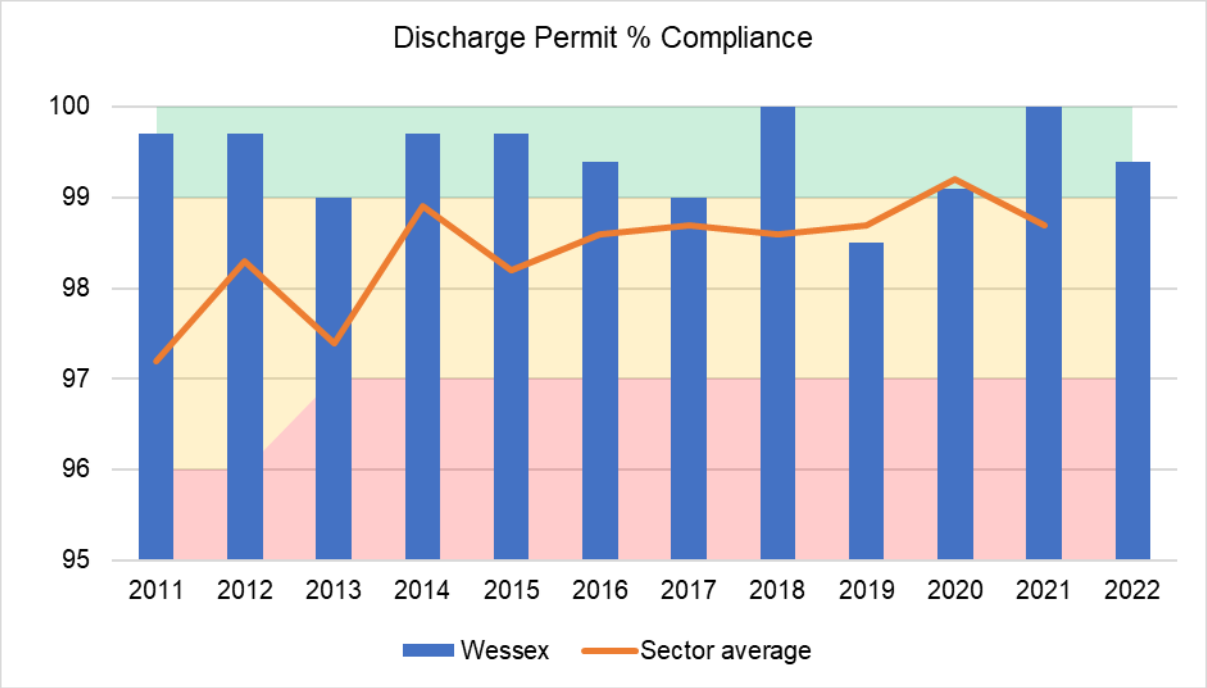
Table 2: Discharge permit % compliance – industry performance

WaSC	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Anglian	97.1	98.1	97.5	98.6	99.0	99.1	98.6	98.2	98.6	99.3	98.2	
Northumbrian	99.4	100	98.1	99.4	99.4	97.8	96.0	99.4	96.6	99.4	**98.3**	
Severn Trent	97.5	99.1	99.3	99.9	99.0	99.6	99.6	98.4	99.6	99.6	**99.3**	
Southern	96.0	96.8	96.0	99.0	99.3	98.7	97.1	99.1	98.8	97.1	**97.9**	
South West	90.1	97.1	92.5	96.1	95.8	98.1	98.2	98.7	98.7	99.0	**97.5**	
Thames	99.7	99.1	95.7	98.9	99.1	97.9	99.5	99.0	99.7	99.7	**99.0**	
United Utilities	98.6	99.2	98.6	98.3	97.2	97.4	98.8	98.7	98.5	99.7	**99.0**	
Wessex	**99.7**	**99.7**	**99.0**	**99.7**	**99.7**	**99.4**	**99.0**	**100.0**	**98.5**	**99.1**	**100.0**	**99.4**
Yorkshire	97.3	93.2	98.0	99.3	99.3	97.2	98.6	97.5	97.5	99.0	**99.0**	
Sector average	**97.2**	**98.3**	**97.4**	**98.9**	**98.2**	**98.6**	**98.7**	**98.6**	**98.7**	**99.2**	**98.7**	
Wessex Rank	**1**	**2**	**2**	**2**	**1**	**2**	**3**	**1**	**6**	**6**	**1**	

RAG scoring:	2011 - 2012 ≤96 red <99 amber ≥99 green	2013 - 2020 ≤97 red <99 amber ≥99 green	2021 to date ≤98 red <99 amber ≥99 green

Wessex Water have historically consistently ranked 1st or 2nd for discharge permit % compliance and our permit compliance is consistently above the sector average. We have ensured our historical level of investment was appropriate in order to safeguard our ability to maintain this leading performance. As can be seen in the chart below, however, our discharge permit % compliance trend has been slightly downward whilst the sector average has improved. Indeed, in 2018 and 2019 we were below the sector average.

Figure 1: Discharge permit % compliance – Wessex Water performance



A1-4.2. DWF permit compliance

The EA sets limits on the quality and quantity of treated effluent from WRCs to ensure discharges from WRCs do not cause an unacceptable impact on the environment. The flow that may be discharged in dry weather is one of these limits. DWF is the average daily flow to a WRC during a period without rain, and the permitted DWF limit is set as the planned annual 80% exceed daily volume discharged. For compliance purposes an exceedance is recorded for a calendar year only when the limit at the end of that year is exceeded by 90% or more of the recorded total daily volumes in that year (excluding spurious/missing flow readings).

From 01/01/2026, the EA are changing their DWF compliance assessment. The DWF limits will have been complied with in an assessment calendar year unless the limit was exceeded in the compliance assessment year, and two or more exceedances have occurred in the preceding 4 years, summarised as '3-in-5 year' compliance. Along with discharge permit compliance, the EA are considering adding flow compliance (including DWF) as a further EPA metric from 2027 (based on the 2026 calendar year).

As described in the following section, we have and continue to mitigate enhancement at WRCs linked with DWF compliance through maintenance activities in the sewerage network. This approach has, however, effectively led to a concertina effect where many sites are now at or imminently at risk of exceeding their DWF permit limits, and where infiltration reduction / sewer sealing is no longer sufficiently effective.

A DWF permit increase is associated with a pro-rata tightening of sanitary/nutrient permit limits under a 'maintenance of load' approach, alongside additional storm storage requirements (typically to meet 68l/hd, based on a residential population equivalent) as well as a potential increase to the flow passed forward (FPF) rate.

A1-4.3. Ofwat funding allowance

The table below summarises Wessex Water's request for WRC capacity provision through past business plan submissions and Ofwat's subsequent allowances.

Table 3: Prior business plan allowances for WRC capacity provision

	Business Plan Submission	Stated Capacity Provision	Ofwat (Implicit) Allowance	Actual Expenditure	Actual Capacity Provision
PR09/AMP5 2010-15	£52.9m*	77,095 p.e.	£60.4m	£57.7m	78,930 p.e.
PR14/AMP6 2015-20	£51.9m	72,358 p.e.	£29.5m	£60.4m	71,685 p.e.
PR19/AMP7 2020-25	£72.1m	138,714 p.e. *(see below)*	£49.5m	£23.9m *(to 2022/23)*	42,674 p.e. *(to 2022/23)*

All costs at 2022/23 price base.
* Excludes costs associated with DWF Exceedance, as prior to PR14 quality enhancement due to growth-related DWF exceedance was funded under the National Environment Programme (NEP) as a 'prevent deterioration' driver.

The stated capacity enhancement for PR19 included a significant proportion associated with AMP7 WINEP Flow to Full Treatment (FFT) Increase schemes, with PE stated here but c.95% of costs purpose split to 'Schemes to increase flow to full treatment'. This includes 30,729 PE at Avonmouth (Bristol) WRC and 19,937 PE at Saltford WRC.

For both PR14 and PR19 we submitted WRC growth cost adjustment claims for additional funding above the implicit allowance. On both occasions, however, our claims were rejected. We did not agree with Ofwat's allowance at either PR14 or PR19, but accepted the Final Determination in-the-round. To ensure we continue to appropriately invest in WRC growth to maintain compliance we invested greater than our allowance in AMP6, and are forecasting to do similar in AMP7, with a further £65m forecast by the end AMP7.

A1-5. Best option for customers

Our approach to ensuring DWF compliance is to:

1. Identify WRCs where the measured Q90 flow is approaching or exceeding the permitted DWF.
2. Assess the level of infiltration using population and consumption figures.
3. Survey sewerage catchments to locate areas of infiltration.
4. Prioritise the lengths of sewers identified for sealing.
5. Monitor flows post-sealing works.
6. Apply for a new permit where permit DWF compliance cannot be achieved.

Where WRCs have a measured Q90 flow within 15% of the permit DWF we calculate the theoretical DWF flow. If the calculation indicates that the measured Q90 flow reflects the predicted flow with little infiltration, then we assess development rates and likely timescales for permit exceedance and amendment.

The table on the following page indicates the progress that has been made since 2015. It identifies the investigations and sealing works completed and those planned. Whilst there have been a number of successful sealing works, in other catchments this success has only been partial. The table shows which catchment have been repeatedly visited for sewer sealing works at diminishing levels of success, and where a new DWF permit is now required at the WRC.

We regularly liaise with the EA regarding DWF compliance. For a number of the sites exceeding for extended periods we have engaged with the EA about aligning with PR24 WINEP requirements – such as phosphorus removal – to ensure we deliver holistic upgrades to the sites at lower overall costs. This does mean that we hold DWF compliance risk for longer. As noted earlier, with EA’s change in DWF compliance assessment and the likelihood of it becoming a metric in the EPA, we are no longer in a position to take this approach.

Table 4: DWF compliance and network mitigation measures

	Network Measures & Sewer Sealing Lengths (INV = Investigations, MF = Monitoring Flows, MHs = Manholes)									Flows										
Water Recycling Centres	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24 (planned)**	**Permit DWF m³/d**	**Q90 2014 m³/d**	**Q90 2015 m³/d**	**Q90 2016 m³/d**	**Q90 2017 m³/d**	**Q90 2018 m³/d**	**Q90 2019 m³/d**	**Q90 2020 m³/d**	**Q90 2021 m³/d**	**Q90 2022 m³/d**	**DWF 3 in 5 Year**
All Cannings	INV	445	MF	985 & MHs	MF	INV	734		245	**240**	279	259	288	259	236	265	392	332	167	Fail
Bishops Caundle					INV	664				**52**	42	48	60	43	41	50	51	50	44	Pass
Bradford on Tone	450	MHs & INV	14 & MHs			INV		263	INV	**280**	330	454	266	252	206	291	248	286	217	Pass
Buckland Newton	INV	MF	489		150	330	1,656	103	INV	**83**	101	80	165	122	130	165	197	162	127	Fail
Burton			INV				INV	244		**32**	35	33	36	27	29	25	37	38	31	Pass
Cannington		INV					INV			**510**	452	524	379	394	516	560	557	646	508	Fail
Cerne Abbas	330						INV			**159**	175	122	125	105	120	118	116	127	128	Pass
Ditcheat	INV	215								**144**	136	152	129	139	107	102	102	97	72	Pass
Fitzhead			INV							**55**	37	45	62	20	20	27	42	45	38	Pass
Great Somerford			INV							**177**	144	156	198	147	149	141	173	167	145	Pass
Great Wishford	INV	197	331	INV	235	INV	499	103	130	**791**	1,243	1,062	1,066	926	959	911	870	927	485	Fail
Halstock		INV								**95**	84	103	73	90	51	50	65	77	43	Pass
Hatch Beauchamp		INV							INV	**70**	67	70	81	90	82	74	72	78	78	Fail
Holt Pond Head							INV	211	INV	**75**	41	45	40	41	39	61	82	91	98	Fail
Hurdcott	INV	450	INV		898		INV		286	**2,034**	2,680	2,877	2,461	2,652	2,735	2,444	2,439	2,621	2,149	Fail
Lavington Woodbridge		INV	491 & MHs							**1,212**	1,393	1,241	1,157	1,132	992	1,023	1,208	1,119	1,030	Pass
Leyhill					INV	145		223		**300**	Adopted in 2016		289	275	305	308	298	285	244	Pass
Longburton	801	INV	MF	88 & MHs			601	230		**75**	84	81	149	102	81	96	82	92	71	Fail
Marden							INV	35		**190**	131	108	140	126	145	155	217	190	131	Pass
Marnhull Common				INV		215				**1,163**	1,159	1,068	1,119	1,238	1,091	1,100	1,136	1,089	1,043	Pass
Meare					INV			542		**227**	174	199	184	188	221	192	228	253	219	Pass
Merriott								879		**1,184**	865	686	689	675	625	497	1,179	1,290	1,162	Fail
Milborne Port	INV	92	MF	716		INV		1073		**900**	931	914	887	950	960	1,122	1,027	811	651	Fail
North Petherton		INV	267							**780**	803	804	727	667	642	721	715	725	654	Pass
Nunney		INV								**334**	427	335	205	212	246	233	255	226	173	Pass
Over Stratton	INV					263				**71**	131	92	69	90	70	81	89	93	83	Fail
Pewsey	INV	66	MF			56	308		INV	**1,596**	1,741	1,620	1,730	1,565	1,650	1,751	2,037	1,719	1,683	Fail
Puncknowle				INV						**435**	228	351	380	481	332	303	267	277	232	Pass
Ringwood				INV	INV	963		241	INV	**4,564**	5,277	3,868	3,791	4,681	4,912	4,753	4,624	4,984	4,205	Fail
South Perrott		INV	107							**160**	171	172	151	153	134	59	124	127	124	Pass
Stourton Caundle					INV					**100**	51	46	40	41	112	72	41	34	24	Pass
Sydling St Nicholas	374	MHs	MHs	MF		INV			450	**86**	118	113	110	71	53	63	69	69	53	Pass
Thornford	532	MF								**670**	676	630	518	591	493	541	441	425	359	Pass
Tisbury	INV	257	MF						INV	**925**	1,037	980	792	838	816	933	1,060	879	876	Pass
Wellington			INV	854						**3,750**	3,158	2,981	3,018	3,042	2,997	3,001	3,244	3,189	2,789	Pass
West Lavington			491							**1,212**	1,393	1,241	1,157	1,132	992	1,023	1,208	1,119	1,030	Pass
Wiveliscombe Styles				INV				INV		**318**	334	296	269	304	244	293	310	418	268	Pass
Wookey	INV	248	INV	572	MF	INV		743		**315**	434	439	427	507	308	372	387	455	404	Fail
Length Sealed (m)	**2,487**	**1,577**	**1,295**	**2,952**	**1,283**	**2,636**	**3,798**	**4,890**	**1,111**											

An example of sewer sealing improvement in permit DWF compliance is below.

Figure 2: Sewer sealing improvements prior to sealing (2013)

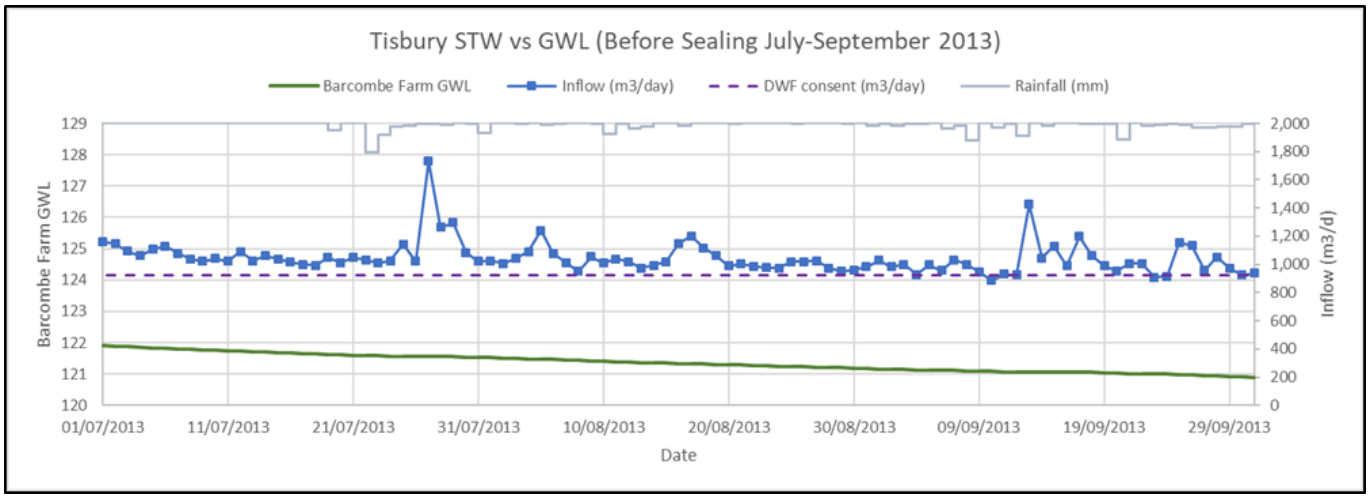
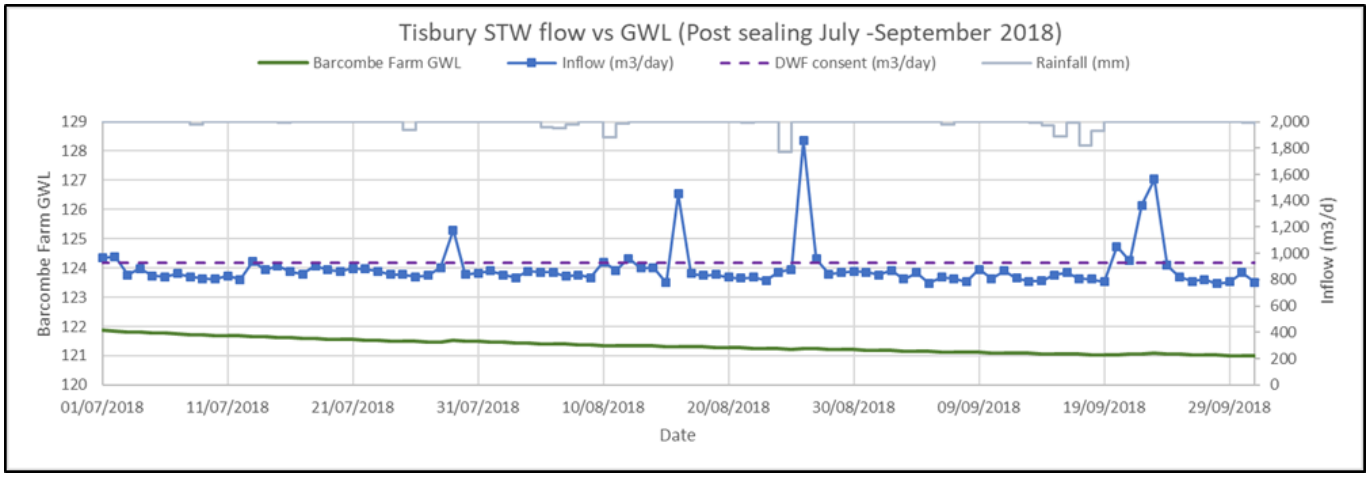


Figure 3: Sewer sealing improvements post sealing (2018)



For those catchments where sewer sealing does not show a demonstrable reduction in measured DWF and thus DWF compliance remains a risk, an increase in the DWF permit limit is required. For these WRCs we assess a number of different options, including many as described in our Drainage and Wastewater Management Plan and as summarised in the table below. We typically use a 20-yr planning horizon when forecasting new DWF permit limits, although in some cases adopt a shorter design horizon, for example to reduce the enhancement spend needed to achieve other permit limits (which could include tolerating a tightening of limits), or if there is uncertainty in the forecast growth, or to align with other expected future changes on site (either linked with a WINEP quality driver or capital maintenance needs promoting wholesale changes to a site's operation).

Table 5: Unconstrained options at WRCs

Option	Description
Modify consents/permits	Review/revise permits with the EA.
River catchment / dynamic permitting	Work with the EA to spread loading across the catchment, or seasonal/flexible permitting.
Tolerate	Site already achieving new permit requirements.
Optimise/operate	Increase the efficient use of the existing capacity with the existing assets.
Treat/pre-treat in network	Reduce load transferred to the WRC, e.g. network chemical dosing.
Rationalisation/centralisation	Close smaller treatment works and transfer flows to a larger one
De-centralisation	Remove flows from a treatment works and create localised treatment works
Catchment management initiatives	Source Control – Treating either diffuse or point-source non-domestic elements of wastewater before they enter the sewer system
	Catchment Nutrient Balancing – Treating and controlling the other contributors to the environment.
Discharge relocation	Relocate effluent discharge to remove/reduce the need for other enhancement.
Increase treatment capacity	Green – Nature-based solutions, such as integrated constructed wetlands.
	Grey – Invest in new assets to provide additional capacity.

We plan to provide further supporting evidence in this area as part of our business plan, including individual site/scheme based proposals.

A1-6. Customer protection

Ofwat are proposing a PR24 Performance Commitment on 'Discharge permit compliance', and state in their final methodology that they propose to use the EA's discharge compliance metric definition, as described earlier. Our historical performance for permit compliance is outlined in the table below.

Table 6: Discharge permit % compliance - Wessex Water performance

WaSC	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Discharge permit % compliance	99.7	99.7	99.0	99.7	99.7	99.4	99.0	100.0	98.5	99.1	100.0	99.4

Our target of 100% discharge permit compliance is stretching and our investment in WRC capacity due to growth is critical to meeting treatment works compliance.

As this PC has an associated underperformance payment only, failure to invest and thus failure to meet the PC will ensure our customers are protected.