Appendix – APR Supporting Commentary

Annual Performance Reporting

2021-22

from Southern Water

Annual Performance Report 2021-2022 Supporting Commentary

This document contains additional technical commentary associated with Southern Water's 2021-22 Annual Performance Report (APR) data tables, and commentary addressing specific narrative requirements from Ofwat's Regulatory Accounting Guideline 3.13 (RAG 3.13).

In addition to RAG 3.13, in the letter issued by Ofwat, dated 3rd May 2022, companies were requested to explain Average Pumping Head (APH) data for each price control in their accompanying APR commentary. The completed APH maturity matrix and commentary has been uploaded alongside this document. It provides % of APH derived from measured data, % of sites with measured volumes and/or lift, and any estimation methods applied.

Required additional commentary

Average Pumping Head: significant APH changes from the previous reporting year.
RAW WATER ABSTRACTION: Slightly more than a 5% change compared to previous year's figure. Minor changes will have resulted from variations in flows from each site considered, as well as minor input errors made in last year's data.

RAW WATER TRANSPORT: Less raw water has been pumped in 2021-22 due to above-average rainfall. The Bewl release and Bewl-Darwell transfer were utilised much less than in the previous year, and Testwood Lakes were also out of service for most of the year. Also, due to Eel screen works, pumped refill at Robertsbridge was limited. This has resulted in a more than 5% change compared to the previous year.

WATER TREATMENT: The average for this price control has remained the same.

TREATED WATER DISTRIBUTION: Less than a 5% change in this price control compared to 2020-21.

4.25: In table 6A.13 to 6A.27 companies are required to report water treatment works that have not been used in the year but have not been decommissioned. Companies should provide commentary on any instances where this is the case

The following are water treatment works that have not been used in the year, but have not been decommissioned: Deal Low Level WSW, Keycol WSW, Lewes Road Brighton WSW, Lord of the Manor WSW, Minster Isle of Thanet WSW, Rogate WSW, Shalcombe WSW, St Lawrence WSW, Ventnor New WSW, and Wierwood Forest Row WSW.

4.26: Companies should provide commentary on how they have calculated population and household growth in table 4R including how they have taken account of the 2011 census.

The population forecast is created by Experian Analytics and takes account of the 2011 census and the Office for National Statistics' updated population projections. Each year the forecast is then compared against the latest published Office for National Statistics mid-year forecast to check accuracy.

4.27: Companies are encouraged to provide commentary on how they interpret 'structurally refurbished' in completing line 7C.15. If a company is unable to identify the actual length of rising main that has been replaced or structurally refurbished, then it should submit an estimate and fully explain the methodology used and the assumptions made in the accompanying commentary.

Two rising main replacements have been completed and post-completion documentation provided during 2021-22. Structural refurbishment of rising mains comprises a permanent solution such as pipe replacement or bespoke in-pipe renewal such as lining with an expected design life exceeding 50 years. Refurbishment of part can be included, but only where the affected length is greater than 50m, in accordance with Southern Water's Structural Sewer Rehab Policy document.

4.28: Companies should explain the basis of its estimate for line 8A.4 of all the untreated sewage sludge (primary, secondary, tertiary) produced by in-area wastewater treatment processes in the report year, and which is produced as a result of treating non-appointed liquid wastes through appointed wastewater treatment assets

The calculations for sludge TDS generated from non-appointed liquid wastes treated through our treatment works are based on the following:

- For domestic tankered waste a Population Equivalent (PE) has been established from the volumes received. These PEs have been applied to the receiving site's sludge make/PE to calculate the amount of sludge arising from these imports.
- The commercial tankered waste annual BOD data has been used and converted to a PE for each receiving site, assuming 60 gms/BOD/day. The calculated PE for these wastes has been applied against the sites' sludge make/PE to generate the amount of sludge from these imports.

4.29: In lines 8A.10 and 8A.13 we ask for a measure of intersiting work done by tanker. In line 8A.11 we ask for a measure of intersiting work done by truck. In lines 8A.15 and 8A.18 we ask for a measure of work done in sludge disposal operations by tanker. In line 8A.16 we ask for a measure of work done in sludge disposal operations by truck. If actual road distances are not available companies should estimate the road distance and state in the commentary if this is the case.

Radial mileages for all data sets relating to haulage movements are taken from the actual radial mileage distances submitted by our waste and recycling contractor. These are converted to 'actual kms' by utilising a conversion factor from miles to km and then a factor of 1.6 to convert from radial distance to 'actual'. This is in line with previous reporting years.

4.30: In table 8A where both the incumbent and a third-party service provider undertake different stages of sludge treatment, e.g., dewatering followed by lime stabilisation, sludge quantities should not be doubled-counted and should be reported either in line 8A.1 or line 8A.2, not both. Where this situation occurs, the companies should report on the quantity involved and the line to which it has been allocated in the commentary.

N/A. Southern Water undertakes all its sludge treatment and dewatering activities.

4.31 Companies should explain the basis of their estimate of total sewage sludge produced from non-appointed liquid waste treatment reported in line 8A.4.

See commentary in 4.28 above.

4.32 The default assumption will be that the population equivalents reported in lines 7D.17 to 7D.20 will be served by sewage treatment works (STWs) at which the required output has been delivered primarily by a capex solution. Where this is not the case companies should report the population equivalent benefitting from (primarily) Opex solutions in their commentary.

As part of our reporting process, we check if schemes are delivered via capex solutions as opposed to opex solutions. Anything delivered via an opex solution is discarded from the reported figure and only population equivalent for capex solutions is included in these lines.

4.33 Where companies have used a different methodology to calculate non-resident population in table 4R they should provide details in their commentary.

N/A

4.34 Tables 4L, 6D and 6F require companies to provide details of their expenditure and benefits delivered in the area of improvements to the supply-demand balance and development of strategic regional water resource solutions. We expect companies to include narrative commentary to report on progress and deliverables in these areas. This should include explanation of any variances from their business plan and water resources management plan proposals.

While both PCC and leakage have been impacted by the Covid-19 pandemic, we are continuing to deliver our planned measures and we are driving demand reduction across our region. We have reviewed and revised our long-term strategy for achieving Target 100 while maintaining our delivery of home visits and customer awareness campaigns. We have deployed a smart meter pilot using clip on devices, which we will use to test and validate our behaviour change options, as well as informing a wider smart meter programme in AMP8.

Our Board has approved additional investment to accelerate our leakage reduction programme in recognition of having not met our PR19 target reduction. Following the successful implementation of phase one of our advanced pressure management scheme, we have commenced the delivery of phase two of the plan and have so far delivered 20 advanced pressure management installations (out of 57 planned for installation in 2022-23). We have also expanded our front-line leak detection team with skilled resources to drive leakage levels below the Natural Rate of Rise.

In summary we have made strong progress with the delivery of our obligations and maintained the supply-demand balance through 2021-22 without the need for drought interventions including any drought permits or orders. However, we acknowledge that there are areas of our WRMP and PR19 plans that are not on track, and we have put credible recovery plans in place to safeguard customers and the environment, full details of which can be found in our published Water Resources Management Plan Annual Review 2021-22.

4.35 Table 6B requires companies to report their total annual leakage. This figure should be derived from the same leakage data that is used in both leakage performance reporting (as an input to the three-year average calculation) and annual water resources management plan reporting. Companies should include explanation of any variances from their business plan and water resources management plan proposals.

This year, we recorded a three-year rolling average of 94.9 Ml/d and while this was outside the target set for us by our regulator of 93.9 Ml/d, we have made several improvements. In our commissioned National Rate of Rise (NRR) report completed by our service partners we have seen an increasing NRR which may be up to 150Ml/d. The report indicates that we are deploying and applying our Active Leakage Control efforts on a very effective basis. The delivery of our Calm Networks project is showing some benefit, but on a demand reduction basis rather than bottom-up leakage figure against the potential savings that were forecast.

Changes to household and non-household customer demand and usage patterns during COVID-19 lockdowns continue to be monitored to make sure we understand how they are having any impact on our

reported leakage levels, and in February, the second phase of our advanced pressure management began as part of our Water Network digitalisation project. Recruitment of additional detection resource is in progress and a number of mains replacement schemes began in May, all of which will continue to drive down leakage. Please also refer to section 3.4.of our published Water Resources Management Plan Annual Review 2021-22.

4.36 Table 6D requires companies to provide detail of their smart metering programmes. We understand that several alternative smart meter technologies can be adopted by companies. Companies should include narrative commentary explaining the smart metering technologies it is utilising and the capabilities and benefits these provide.

Our current smart meters in situ are all AMR ARAD meters with limited smart capability.

In terms of our metering plan, and in line with our Target 100 performance commitment, we're currently doing a Smart meter trial, testing an industry assumption that we can reduce water consumption by 3-5%, over a year, by giving people data on how much they use. We're working with a behavioural science platform to give smart meter households access to their data hourly, including as part of our trial. The platform allows us to talk to householders regularly and offer incentives and prompts to reduce consumption.

We're working with a local innovation hub with a network of thousands of start-ups, to scope our new water-efficient products and technology that will complement our behaviour-designed initiatives.

We're working on plans to install smart meters at 30% of our households by 2027, 60% by 2028 and 90% by 2029, so everyone will have personalised data to help them use less water and to meet the metering penetration targets set out in the WRMP and our business plan. Our meter penetration is increasing as we connect new developments (this is the % new connections with meters impacting overall supply base) and optants (circa 1,000 a year) with existing AMR meters. However, the bulk of the ramp up in meter penetration will be delivered once we have selected a new AMI capable meter and we are in the process of recruiting to set up our project team, including a Smart Metering Programme Lead to head up our Smart Metering programme which will identify, procure and deploy Smart Meters over the next few years to extend our installed base from 88%-92% of homes across our area.

4.37 We expect companies to include narrative commentary to explain how the metering and leakage figures reported in Table 6D relate to their business plan and water resources management plan forecasts.

Please see above commentary on 4.35 on leakage, and 4.36 on smart metering.

4.40 Common performance measures

Water supply interruptions:
Southern Water remains fully compliant with the guidance with all elements of the RAG at green.

Leakage and Per Capita Consumption (PCC):
There has been no change to the RAG provided to Ofwat in association with the restatement of our leakage and PCC values for 2020-21, and in association with query number SRN_APR_IP_001 provided in August 2021. We continue to report water balance data in a way that is entirely consistent with the three-year rolling average baseline. We are running parallel reporting internally with amendments made to both the calculation of household night use, and further work being done on the remaining amber elements, this change reduces our water balance gap to 3.15%, and further changes to unmetered household consumption (see 6D.19 Per capita consumption commentary in this document) are being introduced to this shadow reporting in order to ensure we are fully compliant by the start of AMP8.

Mains repairs:
Southern Water remains fully compliant with the guidance with all elements of the RAG at green.

Unplanned outage:

Over the course of the year, PWPC unplanned outage has improved significantly reducing from 9.21% to 7.19%. This is largely due to significant investment through reactive capital expenditure and driving adherence to our PWPC testing program. However, elements 3a (source data - programme of work) and 6b (evidence of water quality events) remain amber . This is because during the year a number of manual processes remained in place meaning that data had not been recorded for individual assets taken out of service unless they affected the sampling program, and as evidence of water quality events was not being recorded unless this caused full outage. Following the completion of the 2021-22 submission and RAG assessment this has now been addressed with all incidents of planned outage requiring full documentation, and for all water quality events from July 2022 to produce a fully compliant data set in 2022-23, and all water quality exemptions to be reviewed and approved by the relevant internal team.

Internal sewer flooding:
Southern Water remains fully compliant with the guidance with all elements of the RAG at green except for 5. Neighbouring properties. This remains at amber as whilst property checks are carried out, these are manually recorded and therefore subject to error.

Sewer collapses
Southern Water remains fully compliant with the guidance with all elements of the RAG at green.

PR19SRN_WWN15 Natural capital

In the PR19 final determination it was stated that, as this is a new measure in the 2020-25 period, the company's CCG was concerned that there was insufficient information on which to set targets. As such we committed to revisit our ambition and set out how much we would outperform our performance commitment by within our annual performance report for 2021-22.

We have now developed a natural and social capital framework which sets out the key principles, steps and metrics that should be applied when assessing natural and social capital. The framework is broadly consistent with the key steps of natural capital assessments set out within Defra's Enabling a Natural Capital Approach (ENCA). With respect to metrics that can be used to quantify and value changes in ecosystem services, the framework is primarily reliant on the Environment Agency's metrics for Wider Environmental Outcomes (WEOs) which are recommended for use when appraising options as part of the Water Industry National Environment Programme (WINEP).

The natural capital catchment accounts are being developed such that they are consistent with this framework. In developing the initial three catchment natural capital accounts, and as mentioned in our Annual Report and Financial Statements 2021-22, in February we reviewed the early outputs from our new Natural and Social Capital framework. This provides a long-term roadmap to support the embedding of multi-capitals thinking into our investment planning.

Our reputational performance commitment initially committed us to deliver baseline natural capital catchment accounts for three areas the Test & Itchen, Arun & Western Streams and Medway catchments but having revisited this, we believe we can go further to protect river catchments in our region so have expanded this to include an additional three catchments. Summaries from this important work will be shared on our website, starting with the original three in 2022-23.

Data trends, anomalies, and additional commentary in relation to non-financial data

Information on the Reporting and Assurance requirements (PSR Reach and PSR Data-Checking) for Table 3F

Companies are required to provide the following commentary on:

PSR reach: companies should present PSR membership by separately reporting forecast annual figures for individuals registered receiving support through PSR services for a) communication, b) support with mobility and access restrictions c) support with supply interruption, d) support with security and e) support with other needs.

Help with communication – 6,222; support with mobility/access restrictions (assumed to be those with needs codes - physical health, ventilator, progressive condition, C.I. & Dementia, Dialysis, req Oxygen) - 25,918; support with supply interruption - all; support with security (those with password on the account) - 144; support with other needs - all (we tailor our services according to circumstances and needs code).

PSR data-checking: Companies should report the number of households added and removed from the PSR if the data is not available to report numbers of individuals. Where possible, the company should report the corresponding figure for individuals alongside this.

151 customers removed from the PSR, 20,197 added.

PSR Reach continues to grow at a significant rate, increasing from 0.9% at the end of the last AMP to 2.9% currently. The Common Performance Commitment of 7% by the end of the AMP remains challenging but we continue to look for ways to increase registrations (including targeted campaigns and data sharing). The "Attempted to contact" metric was not achieved this year due to human error causing duplication of effort - meaning that some customers were part of a data cleanse initiative twice whilst some missed out. Going forwards the selection of customers for contacting is automated and we fully expect to hit the 90% target.

Data quality issues

As part of the audit process, we found that the figure for households on the PSR in March 2020 was inaccurate and didn't represent the full picture. The figure has been revised accordingly (increased by 2,076). The issue arose due to the March 2020 data being arrived at through a different process - going forwards all PSR data will be held in the same report, which will resolve this issue, and which is why the confidence grade is higher for the PSR Reach figure for this financial year.

The overall approach of the vulnerability support satisfaction questionnaire is consistent with that used in the company's baseline survey for 2017-18 (as per Ofwat guidance), but the methodology has been enhanced. The methodology differences aren't material, and the enhanced methodology was utilised last year. The details of the changes are outlined in our inter process document.

4R.17 & 4R.18, New Connections

There has been an increase in the number of new household connections by 2,154 (30%) compared to 2020-21. The number of new unmeasured connections has more than doubled from 721 last year to 2,050 this year. However, the vast majority of these customers are on assessed charges which means that they may have a meter but are on an assessed tariff rather than a measured tariff. PR19 new household forecast for 2021-22 was 12,569. There are thus 3,078 (24%) fewer connections than forecast. This is an improvement from last year but means that growth in AMP7 thus far has been significantly lower than forecast.
The number of new non-household connections is lower by 127 (28%) compared to last year and by 364 (53%) compared to the PR19 forecast for 2021-22. This probably reflects the impact of COVID-19 on businesses during 2021-22. A confidence grade of B3 is applied to non-household data as data is provided by a third-party - Market Operator Services Ltd (MOSL). MOSL is the market operator of the non-household market in England. The source of data is the Central Market Operating System (CMOS) maintained by MOSL. We have no direct control over CMOS.

PR19 growth forecast was informed by local area plans. The figures show growth planned by the local authorities over the first two years of AMP7 has not been delivered.

4R.28-30, Total Population

This reporting year we have rebased the population figures to the new EDGE population forecast. EDGE analytics are a different data provider to Experian, but the methodology remains unchanged. This improves accuracy on a local authority level when compared with the Office of National Statistics' (ONS) mid-year population estimates. This also brings the Dartford local authority back within 5% of ONS estimations. On a company level this sees a 1% increase in water household and non-household population and water supply zone population from 2020-21. Wastewater residential population sees a 2% decrease from 2020-21. Wastewater non-resident population sees a 6% decrease but is not due to the population forecast rebasing, but due to Tourism South East bedspace data being lower for the local authorities that were updated this year. As a result, there is little change against the lines reported but the data used is more accurate due to it being more aligned to current ONS population estimations.

Following Ofwat guidance after our 2020-21 submission, 4R.28 Water population now includes non-household population as well.

4R.30. Southern Water does not include non-resident population in our calculations for PCC, so this has been recorded as 0 as per RAG 4.10.

Reported energy consumption in 5A.24, 6A.32, 7E.6, 7E.7, 7E.8, 6A.7, 6B.27

Last year total gas consumption was 1,867MWh, this year it is 2,585MWh, an increase of 38.45%. The prior year had seen a reduction of 17% driven by office usage due to Covid. With offices re-opened in 2021-22 this has contributed to the subsequent increase. Last year self-supply from generation was 42,180MWh, this year it is 40,628MWh, a reduction of 3.68%. This was due to Combined Heat & Power performance issues on some engines and our Otterbourne solar array being out of service for six months. As consumption is split by price control, these and minimal increases to electricity and transport consumption have caused increases in usage across the board.

5A.21 Total installed power capacity of intake and source pumping stations

We have undertaken a significant number of data cleansing exercises including the removal of duplicate water pumping station data and improvement of our pumping station information. This has also impacted 6B.1 Total installed power capacity of potable water pumping stations and 6B.2 Total volumetric capacity of service reservoirs leading to a decrease of 5.5% and an increase in the total volumetric capacity.

6A.11 Water exported to 3rd parties' raw water transport systems

This was reported as 0 in 2020-21, as the volume had been included elsewhere. Following improvements to our reporting process, this is now being recorded in full with a value for 2021-22 of 19.249 Ml/d from bulk supplies to other water companies not included in the DI.

6B.25 Total number of service reservoirs

In 2020-21 this was recorded as 205, this was an error in the count within our systems, and the correct figure is 204.

6B.30 Water imported from 3rd parties' treated water distribution systems

This has seen a significant increase as it is now inclusive of the Portsmouth Water volume previously not being considered. This has been corrected this year.

6C Water network+ - Mains, communication pipes and other data

Numerous changes have been made to our water mains base data in our GIS mapping tool over the last year and a half. As a result, the numbers submitted for 2021-22 are taken from a systemised approach as opposed to manual calculations in spreadsheets which had been used historically. Particularly the removal of duplicate records, and an up to date cut of data from our mapping systems has resulted in an overall decrease to our total mains lengths.

6D Demand management – metering and leakage activities financials

All our metering costs are capitalised. In order to derive figures at the level of granularity requested, we have proportionately allocated meters based on the numbers installed.

6D. Meter installations and renewals, lines 6-14

We have seen an increase in the failure rate of some components within our existing ARAD meter base, which is likely to be the main cause of the increase in reactive exchanges being undertaken. Optant meter exchanges have also increased; these are works requested by our customers, so the numbers fluctuate based on customer demand. Due to COVID and delays in obtaining electrical components for the production and manufacture of meters from our suppliers, there is likely to be an increased backlog of work requests, this may result in a further increase in the numbers submitted 2022-23.

6D.19 Per capita consumption (unmeasured customers)

The decrease in overall PCC is entirely driven by unmeasured household PCC which has decreased by 23.5% or 46.8l/h/d from 199.3l/p/d to 152.5l/h/d. Measured household PCC has increased marginally from 130.5l/h/d to 131.0l/h/d. Measured household consumption has increased in Ml/d terms from 291.1Ml/d to 296.1Ml/d (5.0Ml/d or 1.7%) primarily due to growth, but also in part due to an increase in meter under-registration. Unmeasured PCC is calculated as the residual volume after all known components of Distribution Input (DI) have been subtracted from DI in a selection of DMAs considered to be representative of our overall unmeasured household customer base. Decrease in DI together with an increase in leakage and non-household demand remaining more or less the same suggests that household demand has gone down. This is to be expected given the lifting of COVID-19 related restrictions in the latter half of 2021-22. We would expect this to be reflected in measured PCC as well. Our measured household meters are read every six months. While changes in overall demand are instantaneously captured in DI, there is a time lag before they are fully reflected in measured household consumption. This is not an issue under normal circumstances but given that we had COVID-19 related restrictions at the beginning of the year which were gradually lifted over time, the time lag has probably led to measured PCC being higher and unmeasured

PCC being lower than would otherwise be the case. The overall PCC is however is considered to be a fair reflection of reality.

Although the PCC has come down from last year, it is still higher than we had originally forecast, and we are therefore behind our target. This is largely due to the COVID-19 related restrictions that were in place during part of the year. We expect PCC to reduce over the remainder of the AMP as we continue with our water efficiency programme.

The RAG status of our current unmeasured household calculation methodology is red predominantly because of our high meter penetration which means that we cannot set up conventional individual household monitors (IHMs) or small area monitors (SAM). Our methodology uses a mass balance approach using entire DMAs as SAMs. This allows unmeasured and measured household consumption to show opposite trends which is counter intuitive. We commissioned a study into our methodology to improve its RAG status. The study recommended an alternative methodology using measured household consumption as a proxy for unmeasured household methodology. We have developed a new methodology in line with the recommendation and our analysis shows that it would have led to +/- 2% change in our reported leakage and PCC figures going back to 2017-18. However, since our performance indicators (leakage and PCC) are based on existing methodologies, we have agreed to maintain consistency between our target baseline and actual performance. We will start calculating unmeasured PCC, and consequently the water balance, using the new methodology from 2022-23 internally to provide a clear picture of its impact on the reported leakage and PCC figures over the course of AMP7 and plan to switch to the new methodology from the start of AMP8.
We currently do not have information on non-resident household population in our supply area and do not account for them in our water balance. That is why we have inserted zero against them in table 3F.

6F WRMP annual reporting on delivery - non-leakage activities

Ofwat guidance dictates that the classification of the Water Resources Management Plan (WRMP) schemes delivered should be one of the following four categories, and that their expenditure should reconcile to the same categories in Table 4L: -

- Supply-side improvements delivering benefits in 2020-2025
- Demand-side improvements delivering benefits in 2020-2025 (excl. leakage and metering)
- Internal interconnectors delivering benefits in 2020-2025
- Supply-demand balance improvements delivering benefits starting from 2026

However, we do have a number of schemes that fall within those categories that do not form part of our WRMP, therefore a reconciliation is required to Table 4L.

Demand-side improvements do match and so do not form part of the following reconciliation table.

Classification	20-21	21-22
Supply demand balance improvements delivering benefits starting from 2026		
Table 6F	8.371	0.624
Table 4L	8.477	0.953
Difference	**0.106**	**0.329**
Reconciling Items		
Change in Classification		
Internal interconnectors in 21-22	0.023	0.000
Other		
Mitigation for Sussex North deficit	0.000	0.012
AIM	0.061	0.165
WQ Directive	0.021	0.004
WRSE	0.000	0.149
Total	**0.106**	**0.330**
Supply-side improvements delivering benefits in 2020-2025		
Table 6F	0.071	0.496
Table 4L	2.270	-0.011
Difference	**2.199**	**-0.507**
Reconciling Items		
Change in Classification		
Impounding Reservoir in 21-22	1.020	-1.020
Other		
Metering related	0.572	-0.170
WRMP14	0.099	0.539
Moved to Strategic Regional Water Resources in 21-22	0.438	0.000
Groundwater licence variation (1 in 500 year event)	0.070	0.143
Total	**2.199**	**-0.507**
Internal interconnectors delivering benefits in 2020-2025		
Table 6F	0.023	0.613
Table 4L	0.000	0.613
Difference	**-0.023**	**0.000**
Reconciling Items		
Change in Classification		
Supply demand balance improvements in 20-21	-0.023	0.000
Total	**-0.023**	**0.000**
Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering)		
Table 6F	0.180	2.844
Table 4L	0.180	2.844
Difference	**0.000**	**0.000**

7F Wastewater network+ - WINEP phosphorus removal scheme costs and cost drivers

Line 7F.10: Hexden channel drivers have been completed as one scheme but covering more than one site. Costs for this line are include in line 7F.09.

Line 7F.123: This scheme was reported against phosphate removal incorrectly in 2019/20 and 2020-21. This scheme has been re-purposed in year with £502k being effectively removed. Include for reconciliation to earlier reporting years.

Line 7F.124: This scheme was reported against phosphate removal incorrectly in 2019/20 and 2020-21. This scheme has been re-purposed in year with £845k being effectively removed. Include for reconciliation to earlier reporting years.

Line 7F.123: Given the scale of the programme, early planning and feasibility work was undertaken on the programme as a whole with no particular site solution. This shows the general early costs applicable to all named solutions.

Operating expenditure arising as a consequence of new operational plant is not identifiable until a scheme has reached the detailed design stage. This is the case for many of the schemes shown on the table. Where we have no firm idea of the solution at present and consequently no sensible estimate available for future running costs, we have not included any future forecasts. Future APR editions of this table will update as appropriate.

Separately we have reported two schemes A - Hailsham South WWTW 7SO100173 and B - Hailsham North WWTW 7SO100176/7SO200370, with phosphate removal included, under their own heading of 'WFD Manage uncertainty Special case' on Table 4M. Cost and permit information for these schemes are shown below.

		Capital expenditure						
Scheme	Units	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	After 2024-25
A	£m	2.746	9.411	10.727	0.516	0	0	
B	£m	1.980	5.374	3.626	0.125	0	0	

Operating expenditure						
2019-20	2020-21	2021-22	2022-23	2023-24	2024-225	After 2024-25
	0	0	0.285	0.285	0.285	
	0	0	0.185	0.185	0.185	

Cost drivers		
Site population equivalent	Historical consent for phosphorus (mg/L)	Enhanced consent for phosphorus (mg/L)
31623	1	0.25
17812	1	0.25

A number of the schemes, towards the top of the table, were started earlier than 2019-20. In order to complete the picture, we have also included a table showing pre-19-20 expenditure reported along with an indication of the year they were completed if applicable. This can be found in the table below.

Scheme	3dp	15-16	16-17	17-18	18-19	19-20	20-21	21-22	Total	complete pre 20-21	complete 20-21	complete 21-22	Annual opex - not AMP7
Uckfield WTW - AMP6 Planned Works	£m	0.000	0.452	3.077	2.270	0.134	0.024	0.001	5.958	Yes			0.319
Guestling Green WTW	£m	0.000	0.000	0.210	1.043	0.431	-0.005	0.000	1.679	Yes			0.054
Goddards Green WTW - UWWTD 17	£m	0.017	0.137	0.477	1.831	0.100	-0.070	0.005	2.497	Yes			0.371
AMP6 Planned WTW Edenbridge	£m	0.038	0.310	1.301	0.591	0.082	-0.001	0.015	2.336	Yes			0.076
AMP 6-2 Planned Hooe WTW	£m	0.000	0.169	0.617	2.060	7.518	1.113	0.028	11.505	Yes			
AMP6-2 Planned Cowfold WTW	£m	0.000	0.168	0.110	0.101	2.339	1.425	0.473	4.616			Yes	
AMP6-2 Planned WTW Neaves Ln Ringmer	£m	0.000	0.115	0.361	2.977	0.832	0.041	0.046	4.372	Yes			
AMP6 Planned River Uck Catchment	£m	0.000	0.036	0.458	1.232	5.196	0.651	0.029	7.602	Yes			
AMP6 - 2 Planned Hexden Channel Waterbody	£m	0.000	0.096	0.393	1.627	3.224	0.035	-0.015	5.360	Yes			
Ditchling WTW	£m	0.000	0.012	0.217	0.871	1.788	0.475	0.012	3.375	Yes			
Barns Green WTW	£m	0.000	0.015	0.132	0.221	2.594	0.228	-0.003	3.187	Yes			0.008
Catsfield WTW	£m	0.000	0.012	0.141	0.710	2.254	0.386	-0.017	3.486	Yes			
Coolham WTW	£m	0.000	0.011	0.377	0.165	0.497	0.068	-0.011	1.107	Yes			
Crouch Mayfield WTW	£m	0.000	0.010	0.215	0.733	1.572	0.105	0.004	2.639	Yes			
Plumpton WTW	£m	0.000	0.006	0.160	0.804	1.410	0.088	-0.006	2.462	Yes			
Wadhurst Washwell Lane	£m	0.000	0.016	0.163	0.712	1.105	0.017	-0.002	2.011	Yes			
Maresfield WTW	£m	0.000	0.015	0.221	1.121	1.556	0.082	0.009	3.004	Yes			
Southwick WTW	£m	0.000	0.015	0.150	0.248	2.771	0.665	0.016	3.865	Yes			
Woodchurch WTW	£m	0.000	0.007	0.233	0.859	1.461	0.050	-0.003	2.607	Yes			
AMP6-3 WTW Ansty NEP5	£m	0.000	0.000	0.065	0.041	0.124	0.383	0.880	1.493			Yes	
AMP6-3 WTW Ardingly NEP5	£m	0.000	0.000	0.023	0.097	0.287	0.894	0.968	2.269			Yes	
AMP6-3 WTW Faygate NEP5	£m	0.000	0.000	0.031	0.048	0.112	0.566	1.503	2.260			Yes	
AMP6-3 WTW Lidsey NEP5	£m	0.000	0.000	0.003	0.059	0.228	0.876	1.019	2.185			Yes	
AMP6-3 WTW Loxwood NEP5	£m	0.000	0.000	0.029	0.069	0.140	0.669	0.996	1.903				
AMP6-3 WTW Newbury Lane Cuckfield NEP5	£m	0.000	0.000	0.011	0.040	0.150	0.829	2.554	3.584			Yes	
AMP6-3 WTW Newick NEP5	£m	0.000	0.000	0.035	0.105	0.369	2.290	1.150	3.949			Yes	
AMP6-3 WTW Warnham NEP5	£m	0.000	0.000	0.019	0.050	0.080	0.809	1.303	2.261			Yes	
AMP6-3 WTW Wivelsfield NEP5	£m	0.000	0.000	0.025	0.091	0.312	1.862	0.490	2.780			Yes	
AMP6-3 WTW Wroxall NEP5	£m	0.000	0.000	0.024	0.062	0.202	0.496	2.088	2.872			Yes	
AMP6-3 WTW Benenden NEP5	£m	0.000	0.000	0.035	0.105	0.304	0.691	3.246	4.381				
AMP6-3 WTW Hawkhurst South NEP5	£m	0.000	0.000	0.037	0.112	0.175	1.539	4.047	5.910				
AMP6-3 WTW Mayfield NEP5	£m	0.000	0.000	0.027	0.069	0.205	0.913	0.261	1.475			Yes	
AMP6-3 WTW Henfield NEP5	£m	0.000	0.000	0.031	0.057	0.177	0.715	2.492	3.472			Yes	
Monks Gate WTW NEP5	£m	0.000	0.000	0.044	0.170	0.495	-0.021	-0.004	0.684				
Billingshurst WTW -AMP6 Planned Works	£m	0.000	0.000	0.000	0.000	0.000	0.000	2.349	2.349			Yes	

8C Bioresources energy and liquors analysis

We are currently in the process of our bioresources electricity sub-metering programme, with the meters due to be installed at the majority of our sludge treatment centres between August and October 2022.

As at 31st March 2022 we had no bioresources electricity submetering. The 36.427% meter coverage declared is in relation to our heat consumption, with 66,213 MWh metered of our total energy consumption of 181,769 MWh. In reality we do not have specific heat meters, the numbers were derived from taking spot samples which Ofwat recognises as being metered.

11A Operational greenhouse gas emissions reporting

In its consultation on regulatory reporting for 2021-22 – responses document, Ofwat requested that companies provide a strengths, weaknesses, opportunities and threats (SWOT) based explanatory statement on their approach to reducing greenhouse gas (GHG) emissions alongside the completion of table 11A of the APR (Operational greenhouse gas emissions reporting).

As part of the 2030 Southern Water Net Zero plan, the company has made efforts to reduce its emissions. One important approach taken during 2021-22 has been to source electricity from renewable energy. Therefore, Southern Water procured REGO-backed electricity suppliers, and this is reflected in the data for Scope 2 emissions: market based. The methodology to collect, analyse and input data in the Carbon Accounting Workbook (CAW) has been consistent to the report last year. There are some opportunities for improvement especially with data provided by new suppliers.

Strengths:

- Water industry following standardised methodology develop for 10 years.
- Engagement with a consultancy for CAW annual improvements and feedback.
- Ricardo helpdesk service for technical support and queries.

Weaknesses:

- Several versions CAW 16 can cause errors in the reporting. There were several errors in formulas in table 11A which had to be corrected and the CAW needs improvement.
- UKWIR reported a mistake in Net annual emissions, the emissions reductions are not deducted from the gross emissions in rows 510-513.

Opportunities:

- alignment with polices and voluntary schemes.
- Quarterly data CAW development.

Threats:

- changes in policy and misalignment with GHG reporting, and initiatives.