

Supply-demand balance enhancement:
Feeder model summaries

Cost assessment team
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- Meeting the supply-demand balance to ensure **resilient supplies during droughts is becoming ever more challenging** as water resources face increasing pressures from climate change, population growth, societal expectations and increasing environmental aspirations.
- Companies have proposed various investment programmes to meet these challenges in their business plan submissions. The **justification, cost efficiency and customer protection** of this investment has been assessed as part of the **initial assessment of business plans (IAP)**.
- We have increased the scrutiny in assessing water resources investment at PR19 based on the increasing **strategic importance of drought resilience** and changes in **scale of the investment needs**. We challenge companies to efficiently deliver the necessary enhancements on behalf of customers while protecting the environment.
- The plans and resulting allowances provides **investment to deliver over 800 megalitres per day (MI/d) of new capacity and demand reductions by 2025** through delivery of short-term supply options, leakage reductions, and water efficiency programmes. This is complemented by **300 MI/d through long-term solution development** delivering in the 2030s.
- The scale of capacity to be delivered is consistent with the long-term needs identified in company water resources management plans (WRMP19) which was further reiterated by the National Infrastructure Commission report '*Preparing for a drier future*'. This summarised the high-level **need for 3000 MI/d of capacity by 2050 to maintain resilience**.

- In our response to companies' draft water resources management plans we raised concerns '*the draft plans in the south-east appear to miss a major opportunity to secure the long-term resilience of the region*'. The business plans reaffirmed our conclusion that **at least one strategic supply solution is required over the next 5-15 years** to secure resilient supplies in the south-east.
- Some companies have proposed strategic regional solutions but it is unclear why these options are more preferable than those not selected or selected much further in the future. We have **concerns with consistency of assumptions and inputs** and **transparency of decision making** across the south-east regions' company plans.
- We have allocated up to **£360m** across several companies to consistently investigate and develop several strategic regional solutions (reservoir, effluent reuse, transfer, desalination) in order to **identify the regionally optimum solutions and ensure they are 'construction-ready' by 2025**. Customers will be protected as investment will be returned if an activity is not required or deliverables are not met.

These do not include any benefits gained through metering investment that helps reduce personal water consumption, or those from internal interconnection schemes where it is complex to aggregate individual scheme benefits.



500 MI/d in leakage savings in 2020-25



300 MI/d in additional supplies in 2020-25



300 MI/d in long-term supplies in the 2030s



Up to **900 MI/d** in strategic regional developments

1. Approach



Meeting the supply-demand balance (SDB) to ensure resilient supplies is becoming ever more challenging as water resources face increasing pressures from climate change, population growth, societal expectations and increasing environmental aspirations. We have increased the scrutiny in assessing water resources investment at PR19 based on the increasing strategic importance of drought resilience and changes in scale of the investment needs presented in the water resources management plans and business plans.

- Based on the information presented by companies it is not always clear what is being delivered and when and how the costs and benefits within the SDB enhancement lines, and other enhancement lines such as metering reconcile. For most companies the presentation transparency and consistency (with water resources management plans) has been lacking.
- The assessment at PR14 used a high level SDB enhancement model based on the SDB costs and SDB benefits presented at a company level. We acknowledge that the PR14 approach is no longer fit for purpose and fair for all companies. We conclude this after considering both the uncertainty in the presented SDB costs and benefits, and that the longer-term solutions requiring expenditure over 2020-25 do not deliver benefits until after 2025.
- Two high level approaches to assessing SDB enhancement (see [FM_E_WW_SDB](#)) have been taken:
 1. Materiality test comparing SDB enhancement with company totex to determine if any companies can be assessed via a shallow dive. The shallow dive assessment comprised of applying the company efficiency challenge to the requested totex. This resulted in Hafren Dyfrdwy (no expenditure) and South West Water being subject to the shallow dive.
 2. The deep dive assessment included a disaggregation of costs and benefits into further sub-components and challenge applied through the utilisation of unit costs and assessment of evidence of needs. The disaggregation of the SDB resulted in the following six components: 2020-25 enhancement, long-term enhancement, leakage enhancement, strategic regional solution development, internal interconnections and investigations and future planning.

Supply-demand balance (SDB) assessment process

2020-25 enhancement

- Includes new supply and water efficiency schemes delivering supply-demand balance (SDB) benefits in the period 2020-25.
- Companies have been allocated expenditure based upon our view of their proposed SDB benefit (MI/d). Metering benefits are excluded with metering enhancement assessed separately.
- Unit costs used being the minimum of the industry median forecast unit cost for the period 2020-25, **£1.39m/MI/d** or the company-proposed equivalent.

Long-term enhancement

- 'Local' supply schemes delivering SDB benefit (MI/d) beyond 2025 (not considered regional).
- Each option reviewed to determine if the spend has a valid need (DPC schemes included at this stage).
- Options without a valid need are removed from the expenditure allowance.
- Valid options assessed against the average scheme-type unit cost from industry-wide WRMP option analysis.
- 20% challenge for limited evidence of optioneering and company level cost efficiency applied.

Leakage enhancement

- Expenditure allocated using forecast leakage change in AMP7, adjusted to remove benefits resulting from metering.
- Base allowance considered to cover reductions up to 15% and less than upper quartile performance. or specified as base changes.
- Unit costs applied to leakage reductions beyond 15%, or where company forecasts leakage performance beyond upper quartile by 2025.
- Unit costs used are the minimum of industry median, **£1.60m/MI/d** or company-proposed.

Strategic regional solution development

- Enables the consistent development of multiple strategic regional projects through the planning stage to determine the optimum long-term solution for the region.
- Includes schemes that benefit the south-east addressing the long term deficits facing Affinity, Thames and Southern.
- Schemes such as Abingdon reservoir and Fawley desalination are already included in company plans.
- Company level cost efficiency applied to scheme costs with ODIs needed to protect customers.

Internal interconnections

- Includes network-improvement schemes providing SDB benefit to overcome localised deficits.
- All expenditure has been reviewed to determine if the company has a valid need.
- Expenditure without a valid need is removed.
- Expenditure with a valid need is reviewed and challenged in the context of £m/MI/d and £m per km transfer distance where relevant/known.
- 20% challenge for limited evidence of optioneering and company level cost efficiency applied.

Investigations and future planning

- Includes water resource investigations, water resources management plan and regional plan development.
- We consider these costs are part of base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations.

2. 2020-25 enhancement



- This component includes new supply and demand management schemes delivering supply-demand balance (SDB) benefits in the period 2020-25.
- Companies have been allocated expenditure based upon our view of their proposed SDB benefit (MI/d). Leakage benefits and those from metering (directly through per capita consumption reduction and leakage identification) are excluded. Metering enhancement expenditure is assessed through a separate econometric model.
- The schemes included in this component are generally small supply-side options such as groundwater development, additional treatment/removal of constraints, abstraction licence trades and water efficiency programmes.
- Unit costs used being the minimum of the industry median forecast unit cost for the period 2020-25, **£1.39m/MI/d** or the company-proposed equivalent (see table 2.1).

Table 2.1 – Company 2020-25 delivery scheme unit costs

Company	Company 2020-25 enhancement totex unit cost (£m/MI/d)
Affinity Water	1.54
Anglian Water	1.45
Bristol Water	N/A – none proposed
Hafren Dyfrdwy	Shallow dive – unit cost not calculated
Northumbrian Water	N/A – costs included in base
Portsmouth Water	0.19
Severn Trent Water	1.67
South East Water	1.03
South Staffs Water	1.33
South West Water	Shallow dive – unit cost not calculated
Southern Water	1.55
SES Water	1.14
Thames Water	1.47
United Utilities Water	N/A – none proposed
Welsh Water	3.71
Wessex Water	0.57
Yorkshire Water	0.17
Industry median	1.39

3. Long-term enhancement



- Given the nature of water resources options some of those proposed do not deliver a benefit within the next five years (2020-25) and therefore do not provide a benefit to the submitted SDB. However, where fully justified, this expenditure is required to ensure that schemes with a longer delivery time are progressed to ensure resilience now and in the future.
- This component considers 'local' schemes that deliver a SDB benefit (MI/d) beyond 2025, but that are not considered regional. These are generally smaller scale options supplying less than 50MI/d.
- Each option identified as delivering a SDB benefit beyond 2025 was reviewed to determine if the spend has a valid need.
- Any options or elements of options without a valid need are removed from the expenditure allowance.
- Valid options have been assessed against the average scheme-type costs from industry-wide WRMP option analysis. This benchmarking applied to reservoirs, effluent reuse and desalination option types. A minimum of the company requested and average scheme-type costs have been used.
- A 20% challenge has been applied to costs where limited evidence of solution development and optioneering was provided . A further company level cost efficiency is applied to this component of SDB enhancement.
- Given the long term nature and significant size of this expenditure for some companies, additional customer protection may be required (see specific company actions).

4. Leakage enhancement



Expenditure is allocated using forecast leakage change in 2020-25, adjusted to remove benefits resulting from metering or specified as base changes.

We expect the 15% leakage reduction to be achieved through base costs and only provide an allowance for companies exceeding 15% leakage reduction or who are forecast to go beyond upper quartile performance.

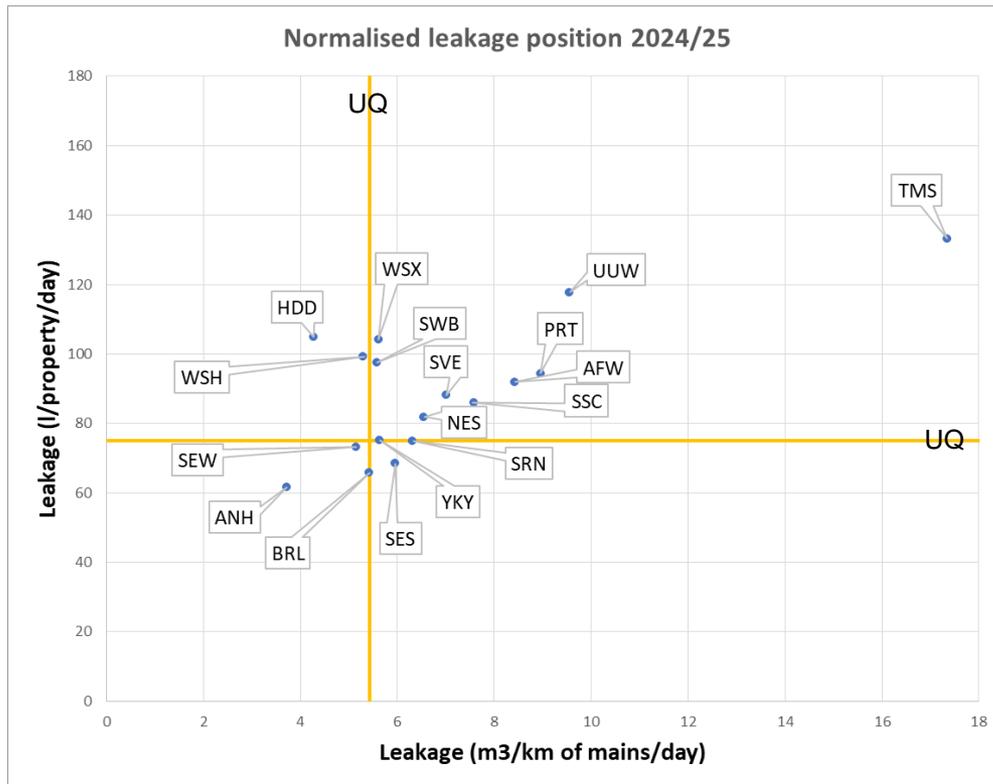


Figure 4.1 - Forecast upper quartile leakage reductions for both leakage metrics

For IAP we have applied the following tests:

1. If **not upper quartile (UQ)** in both normalised measures (by km of main and per property) or reducing leakage by >15% - assume base is funding all leakage reductions.
2. If **reducing leakage by >15%** but not UQ – assume MI/d of leakage reduction beyond 15% funded at the minimum of the industry forecast median unit cost (£1.6m/MI/d) or the company’s proposed unit cost.
3. If a **company will be UQ by 2024-25** in both normalised measures (by km of main and per property) – assume MI/d of leakage reduction beyond UQ level is funded at the minimum of the industry forecast median unit cost (£1.6m/MI/d) or the company’s proposed unit cost.
4. If a company is **both UQ and reducing leakage by >15%** then the company is allocated the greater of these

Leakage 15% test

Table 4.1 - Leakage 15% test analysis

Company	Leakage 2019-20 (MI/d)	Leakage 2024-25 (MI/d)	Proposed reduction	Test result	Leakage reduction beyond 15% (MI/d)	Comments
Affinity Water	162.2	137.9	-15.00%	Fail	N/A	Aligned with company presentation pro-forma
Anglian Water	172.0	142.2	-17.30%	Pass	4.0	Aligned with company presentation pro-forma
Bristol Water	43.0	36.5	-15.12%	Pass	0.1	Aligned with company presentation pro-forma
Hafren Dyfrdwy	12.6	10.7	-15.00%	Fail	N/A	Aligned with company presentation pro-forma
Northumbrian Water	201.1	169.4	-15.78%	Pass	1.6	Aligned with company presentation pro-forma
Portsmouth Water	34.9	29.6	-15.20%	Pass	0.1	Aligned with company presentation pro-forma
SES Water	24.0	20.4	-15.00%	Fail	N/A	Aligned with company presentation pro-forma
South East Water	87.7	75.1	-14.39%	Fail	N/A	Aligned with company presentation pro-forma
Southern Water	105.4	89.6	-14.99%	Fail	N/A	Aligned with company presentation pro-forma
South Staffs Water	84.0	64.4	-23.33%	Pass	7.0	Aligned with company presentation pro-forma
Severn Trent Water	381.1	323.0	-15.25%	Pass	0.9	Aligned with company presentation pro-forma. Note that the company presented 421.6 MI/d (2019-20) and 357.3 MI/d (2024-25) in Table Wn2, line 25, Total Leakage which are inconsistent with the company presentation pro-forma.
South West Water	117.8	100.2	-15.00%	Fail	N/A	Aligned with company presentation pro-forma. Note that the company presented 116.2 MI/d (2019-20) and 100.2 MI/d (2024-25) in Table Wn2, line 25, Total Leakage which are inconsistent with the company presentation pro-forma.
Thames Water	637.9	540.3	-15.30%	Pass	1.9	Aligned with company presentation pro-forma
United Utilities Water	448.2	381.0	-15.00%	Fail	N/A	Aligned with company presentation pro-forma
Welsh Water	169.0	143.5	-15.09%	Pass	0.2	The company presented 169.0 MI/d (2019-20) and 143.0 MI/d (2024-25) in Table Wn2, line 25, Total Leakage consistent with the figures presented in the company presentation pro-forma. However, the breakdown of leakage benefit in Appendix Ref 5.8J PR19: Leakage Improvement indicates a reduction of 25.5 MI/d. The assessment has used a 25.5MI/d reduction with the 2024-25 figure adjusted to 143.5 to represent this.
Wessex Water	78.2	66.4	-15.00%	Fail	N/A	Aligned with company presentation pro-forma
Yorkshire Water	234.6	175.0	-25.40%	Pass	24.4	Aligned with company presentation pro-forma

Leakage upper quartile test

Table 4.2 - Leakage upper quartile test analysis

Company	Leakage forecast 3-year average position in 2024-25 (MI/d)	Industry UQ leakage m3/km mains	Company leakage m3/km mains ¹	Industry UQ leakage l/prop/d	Company leakage l/prop/d ²	Is UQ performance achieved in both measures?	Average upper quartile leakage value (MI/d) ³	Leakage reduction beyond UQ (MI/d)
Affinity Water	142.7	5.42	8.42	75.02	91.91	Fail	N/A	N/A
Anglian Water	149.2	5.42	3.72	75.02	61.74	Pass	172.0 ⁴	22.8
Bristol Water	38.0	5.42	5.42	75.02	65.83	Pass	40.7	2.7
Hafren Dyfrdwy	11.6	5.42	4.28	75.02	104.94	Fail	N/A	N/A
Northumbrian Water	175.7	5.42	6.55	75.02	81.90	Fail	N/A	N/A
Portsmouth Water	30.6	5.42	8.96	75.02	94.34	Fail	N/A	N/A
SES Water	21.1	5.42	5.95	75.02	68.50	Fail	N/A	N/A
South East Water	79.1	5.42	5.14	75.02	73.31	Pass	82.2	3.1
Southern Water	89.6	5.42	6.32	75.02	75.02	Fail	N/A	N/A
South Staffs Water	68.4	5.42	7.59	75.02	86.06	Fail	N/A	N/A
Severn Trent Water	332.1	5.42	7.01	75.02	88.13	Fail	N/A	N/A
South West Water	103.7	5.42	5.58	75.02	97.48	Fail	N/A	N/A
Thames Water	568.0	5.42	17.35	75.02	133.25	Fail	N/A	N/A
United Utilities Water	409.4	5.42	9.56	75.02	117.79	Fail	N/A	N/A
Welsh Water	148.2	5.42	5.29	75.02	99.29	Fail	N/A	N/A
Wessex Water	68.8	5.42	5.61	75.02	104.18	Fail	N/A	N/A
Yorkshire Water	182.8	5.42	5.64	75.02	75.25	Fail	N/A	N/A

Notes:

1. Calculated using *Leakage forecast 3-year average position in 2024-25* and *Mains length forecast 2024-25 (km)*
2. Calculated using *Leakage forecast 3-year average position in 2024-25* and *Property forecast 2024-25*
3. Calculated using average leakage (MI/d) needed to achieve each metric based on company mains length and properties
4. Anglian Water maintains a level of 172 MI/d through the base allowance and the related cost adjustment claim ANH-WN601001, therefore, enhancement is assessed from beyond this point

Leakage unit costs

Company	PR19 SDB enhancement analysis – leakage unit costs (£m/MI/d)	PR19 outcomes analysis – App1 leakage standard underperformance unit costs (£m/MI/d)	PR19 outcomes analysis – App1 leakage standard outperformance unit costs (£m/MI/d)
Affinity Water	1.44	2.53	1.87
Anglian Water	3.30	1.83	1.10
Bristol Water	0.93	0.84	0.80
Essex & Suffolk Water	N/A	0.64	0.37
Hafren Dyfrdwy	N/A	Units not MI/d	Units not MI/d
Northumbrian Water	N/A	0.20	0.20
Portsmouth Water	0.33	0.07	0.13
SES Water	4.85	3.73	3.59
Severn Trent Water	0.52	1.62	1.62
South East Water	2.35	3.41	1.89
South Staffordshire Water	0.49	End of period	End of period
South West Water	0.63	3.62	4.28
Southern Water	2.07	0.98	0.88
Thames Water	3.70	1.77	1.45
United Utilities Water	0.60	0.65	0.65
Welsh Water	2.76	5.00	6.25
Wessex Water	2.42	1.65	1.10
Yorkshire Water	4.20	0.45	1.06
Median	2.07	1.64	1.10
Average		1.60	

Table 4.3 - Leakage unit costs presented in PR19

- The PR19 SDB leakage unit cost is calculated from the SDB analysis in this pack, the outcomes underperformance and outperformance rates is derived from the annual rates presented in App1 of the business plan tables (the submitted cost has been multiplied by 5 to give a £m/MI/d unit cost).
- The triangulated leakage unit cost from the above is **£1.60m/MI/d** which has been used to allocate any allowed leakage enhancement expenditure (where the company unit cost is higher).

Table 4.4 - Leakage allocations based on analysis outputs

Company	15% test result	Upper quartile test result	Leakage reduction beyond 15% (MI/d)	Leakage reduction beyond UQ (MI/d)	Leakage enhancement expenditure allowance (£m)	Comments
Affinity Water	Fail	Fail	N/A	N/A	0.00	
Anglian Water	Pass	Pass	4.0	22.8	36.48	Maintains a level of 172 MI/d through the base allowance and the related cost adjustment claim, ANH-WN601001 therefore enhancement is assessed from beyond this point. 22.8 MI/d applied to industry unit cost.
Bristol Water	Pass	Pass	0.1	2.7	2.46	2.7MI/d applied to company unit cost
Hafren Dyfrdwy	Fail	Fail	N/A	N/A	0.00	
Northumbrian Water	Pass	Fail	1.6	N/A	2.50	1.6MI/d applied to industry unit cost
Portsmouth Water	Pass	Fail	0.1	N/A	0.02	0.1MI/d applied to company unit cost
SES Water	Fail	Fail	N/A	N/A	0.00	
South East Water	Fail	Pass	N/A	3.1	4.91	3.1MI/d applied to industry unit cost
Southern Water	Fail	Fail	N/A	N/A	0.00	
South Staffs Water	Pass	Fail	7.0	N/A	3.40	7.0MI/d applied to company unit cost
Severn Trent Water	Pass	Fail	0.9	N/A	0.49	0.9MI/d applied to company unit cost
South West Water	Fail	Fail	N/A	N/A	0.00	
Thames Water	Pass	Fail	1.9	N/A	3.09	1.9MI/d applied to industry unit cost
United Utilities Water	Fail	Fail	N/A	N/A	0.00	
Welsh Water	Pass	Fail	0.2	N/A	0.24	0.15MI/d applied to industry unit cost
Wessex Water	Fail	Fail	N/A	N/A	0.00	
Yorkshire Water	Pass	Fail	24.4	N/A	39.03	24.4MI/d applied to industry unit cost

5. Strategic regional solutions



What is being considered?

- We identified from the water resources management plans and business plans that at least one strategic solution is required over the next 5-15 years to secure drought resilience in the south-east.
- This regional development is complemented by smaller short-term supply options (delivery <5 years), localised long-term options, water efficiency programmes and leakage management.

Why this intervention?

- Some companies have proposed these types of solutions but it is unclear why the selected options are more preferable than those not selected or selected much further in the future.
- We have concerns with consistency of assumptions and inputs and transparency of decision making across the south-east regions' company plans, these issues were raised in our [consultation responses](#) to company draft water resource management plans (WRMP).

Development costs

- Allocating 6.4% of total scheme construction cost to companies involved to consistently investigate, develop, design and proceed through planning a minimum of five strategic schemes across the region. Several of these may require sub-options being developed to ensure the optimum design is carried forward.
- Companies should collaborate on schemes to ensure that all cost-benefit analyses are all comparable.
- All companies with the potential to be involved receive an equal split for the schemes they will be involved in. If any other water company or a third-party is subsequently involved the allocated funding should be used fairly to engage their involvement.

Delivery and protection

- These projects will be linked gated project deliverables with associated funding releases. For example consistent option design, consistent costing, transparent option filtering and selection, and finally planning permission.
- These will require an ODI-type mechanism with penalties applied if companies do not deliver the outputs or to the timings required (see company actions).
- The result of this expenditure will be that several regional options will be 'construction-ready' by 2025.

Company and scheme allocations

Table 5.1 – Regional options and company allocations

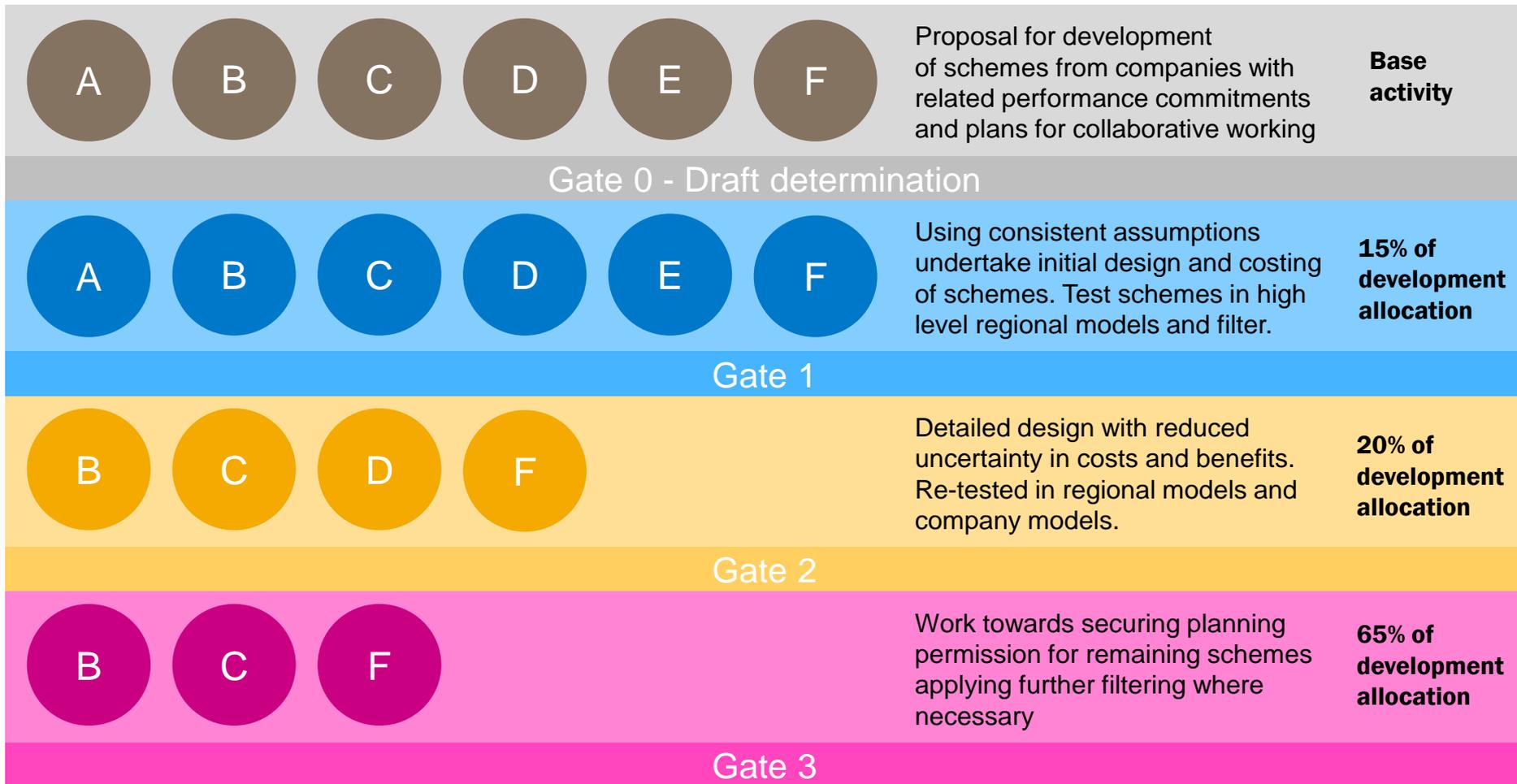
Companies	Proposed regional options	Maximum development allocation (£m)
Affinity Water	Abingdon reservoir (two sizes)	70.9
	Regional transfer from Thames to Southern and Affinity	
	Eastern regional solution/transfer	
Thames Water	Abingdon reservoir (two sizes)	150.5
	River Severn-River Thames transfer (pipeline and canal)	
	Teddington effluent reuse	
	Regional transfer from Thames to Southern and Affinity	
Southern Water	Abingdon reservoir (two sizes)	75.3
	Regional transfer from Thames to Southern and Affinity	
	Fawley desalination/local trades	
Anglian Water	Eastern regional solution/transfer	10.3
Severn Trent Water	River Severn-River Thames transfer (pipeline and canal)	25.7
United Utilities Water	River Severn-River Thames transfer (pipeline and canal)	25.7
Total		358.4

- These proposed schemes already appear in current business plans, or the latest set of draft or revised draft WRMPs. They appear comparable in terms of scale and regional outputs meaning we see benefit in their ongoing investigation and development to ensure confidence for PR24 and WRMP24 plans.
- These costs are based on a 6.4% allocation of total scheme cost – calculated from the water resource management plans or business plans (using PR19 DPC scheme data where available to calculate industry proportion).
- The total maximum allocation is based on the deliverables being delivered on time and to the expected quality all the way through to Gate 3 (construction-ready). An ODI-type mechanism will ensure allocation is returned to customers if the scheme, part of scheme, or a company's need for a particular scheme does not proceed beyond a gate.

Proposed gated process

Pre-DD	Companies develop joint proposals for schemes including plans for collaborative working with related performance commitments, defined deliverables and gated process.	Indicative minimum of five schemes across region	All companies involved at this stage
DD	Proposals presented, consistency of plans between companies assessed and agreed		
Activity 1	Preliminary work to determine consistent availability of water, environmental constraints, environmental and social benefits, etc for all options. Using consistent assumptions undertake initial design and costing of schemes (common cost models and assumptions). Test schemes in high-level regional models to determine benefits in selected set of scenarios. Complete decision-making and filtering on outputs.	Indicative minimum of five schemes across region	All companies involved at this stage
Gate 1	Initial design work completed (using agreed consistent assumptions) and decision-making outputs presented and selected schemes carried forward		
Activity 2	Detailed design with reduced uncertainty in costs and benefits. Re-tested in regional models and company models. Undertake updated decision-making and filtering on outputs including those that are mutually exclusive.	Indicative minimum of four schemes across region	Companies involved in remaining schemes
Gate 2	Detailed design work completed with outputs of decision-making presented and selected schemes carried forward		
Activity 3	Work towards securing planning permission for remaining schemes applying further filtering where necessary	Indicative minimum of three schemes across region	Companies involved in remaining schemes
Gate 3	Agreed schemes 'construction-ready' with planning permission granted		

Proposed gate allocations



By draft determination:

- Jointly propose methods for collaborative working including setting up joint working groups for individual schemes, and defining how consistent assumptions and decisions will be made within these groups and between them.
- Provide more detail on the gated process, the deliverables, timings and expenditure allocations at each gate
- Propose ODI-type mechanisms to allow allocated funding to be recovered by customers in the event of the scheme not progressing to Gate 3 (not all are expected to) and for the non-delivery or late delivery of outputs.
- **Joint scheme proposals presented, assessed and agreed**

By 2021:

- Investigations and preliminary work to determine consistent inputs to decision making and designs, including:
 - baseline and drought condition availability of water
 - environmental constraints
 - environmental, social and economic benefits
 - cost models and assumptions
- Initial design work of schemes to specification required for initial decision making stage
- **Initial design work completed (using agreed consistent assumptions) and decision-making outputs presented and selected schemes carried forward**

By 2022:

- **Detailed design work completed with outputs of decision-making presented and selected schemes carried forward**

By 2024:

- **Planning permission granted for schemes and 'construction-ready'**

6. Internal interconnections



- Several company plans identify internal interconnections to improve the company level SDB position through improving availability of surplus water in drought, and to provide wider levels of supply system resilience.
- Proposed programmes include internal network-improvement schemes providing SDB benefit to overcome localised company deficits.
- All internal interconnection expenditure has been reviewed to determine if the company has a valid need.
- Any scheme or scheme component related expenditure without a valid need is removed from the allowance.
- Expenditure with a valid need is reviewed and challenged in the context of £m/MI/d and £m per km transfer distance where this is relevant and known. Significant outliers have been allocated the 2020-25 enhancement industry unit cost to deliver the component SDB benefit.
- A 20% challenge has been applied to costs where limited evidence of solution development and optioneering is provided. A further company level cost efficiency is applied to this component of SDB enhancement.
- Given the long term nature and significant size of expenditure for some companies, customer protection may be required (see specific company actions).

7. Investigations and future planning



- Companies have proposed expenditure for the delivery of water resource investigations, development of future water resources management plans, as well as regional group co-ordination and regional plan development.
- We consider these are normal operating activities and associated costs are part of company base allowances.
- Planning and co-ordination is part of normal company activity to maintain customer supplies through the provision of an efficient and secure supply-demand balance in order to meet statutory obligations.

8. Company feeder model summaries



The following pack provides a summary of our assessments for all companies on the following enhancement lines:

- Supply side enhancements to the supply/demand balance (dry year critical / peak conditions)
- Supply side enhancements to the supply/demand balance (dry year annual average conditions)
- Demand side enhancements to the supply/demand balance (dry year critical / peak conditions)
- Demand side enhancements to the supply/demand balance (dry year annual average conditions)

- This pack also includes an assessment of bespoke enhancement lines and cost adjustment claims where there is an enhancement to the supply-demand balance:
 - SES Water – Bespoke enhancement – Leakage reduction
 - South West Water– Bespoke enhancement – Clean water service other
 - Welsh Water– Bespoke enhancement – Capital expenditure purpose ~ Leakage
 - Wessex Water– Bespoke enhancement – Enhanced leakage
 - Yorkshire Water– Bespoke enhancement – Leakage Reduction - UQ
 - Severn Trent Water– Cost Adjustment Claim – Water Supply Demand Balance - New supply schemes
 - Wessex Water– Cost Adjustment Claim – Reducing leakage by a further 15%
- We also consider any overlap in terms of costs and benefits with the metering enhancement line:
 - Metering enhancement expenditure is included in a separate enhancement line and is assessed through an econometric model which links to the allocation of expenditure for new developments and new connections.
 - The outputs of this model are noted in the deep dive assessment process where necessary. Any benefits for metering delivered through this expenditure are excluded from the supply-demand balance assessment to avoid double counting.
 - Where companies have included metering expenditure within the supply-demand enhancement lines this expenditure is reallocated to the metering enhancement lines.
 - Where this relates to smart meter installation we have assessed the option presented and allocated costs based upon an assessment of the validity of the option.

Feeder model key

Table 1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
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Table 2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
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Tables 1 and 2:

Supply-demand balance (SDB) enhancement in PR19 business plans are presented in terms of supply option expenditure (critical period and dry year annual average) and demand expenditure (critical period and dry year annual average). Capex and opex (in brackets) values are presented. The companies then present the SDB benefit of this investment in terms of deployable output gains measured in megalitres per day (MI/d) again split by supply and demand, and critical period and dry year annual average. For this analysis we combine the SDB enhancement lines by summing the expenditure (totex) and using the maximum of the benefits between annual average and critical period.

Table 3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (£m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
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Table 3:

Our view of disaggregated costs and benefits based on business plan documentation. This includes a calculated company unit cost for relevant components and notes on decisions for disaggregation.

Table 4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (£m)	Notes
Company efficiency challenge	%	

Table 4:

Our view of company allowance for SDB enhancement based on assessment approach. This includes allowance output per disaggregated component, total company allowance and notes explaining the process. Provides company efficiency challenge that is applied to some components.

A. Severn Trent Water feeder model

Table A.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	116.60	0.0	116.6	
Supply-side (dry year annual average)	116.60 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	36.60	-1.60	35.00	Reallocation of £1.6m to metering enhancement
Demand-side (dry year annual average)	31.99 (4.61)				

Table A.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	No benefits identified in the business plan table therefore information from the plan narrative is used to assess benefits
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	103.61	103.61	No clear reconciliation of benefits with plan narrative provided and therefore narrative figures were used to assess benefits
Demand-side (dry year annual average)	103.61		

Table A.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	117.90	70.60	1.67	£113.3m for delivery of three supply-side schemes (Bamford WTW, Heathy Lea, Peckforton). The documented benefits being 68.5 MI/d are not shown in SDB enhancement table. £4.61m opex for demand management benefit of 2.1 MI/d (<i>PR19 Appendix A8</i>)
Long-term enhancement	3.30	N/A	N/A	£3.3m for East Midlands Reservoir development (<i>PR19 Appendix A8</i>)
Strategic regional solution development	0.00	N/A	N/A	The company proposes a triggered ODI to provide £40m to investigate the River Severn-River Thames transfer. This does not form part of the SDB enhancement lines.
Internal interconnections	0.00	N/A	N/A	None proposed
Leakage enhancement	30.40	58.10	0.52	£30.4m costs taken from documentation (<i>PR19 Appendix A8</i>). Benefits calculated using 2019-20 value 381.1MI/d and 2024-25-value of 323.0 MI/d.
Investigations and future planning	0.00	N/A	N/A	None proposed

Note: The planning table benefits do not clearly reconcile with those in the plan narrative, therefore, we have used the plan narrative figures for the assessment because this could be readily associated with the proposed expenditure.

Table A.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	98.15	70.6 MI/d in identified 2020-25 SDB benefits assessed at the industry unit cost which is lower than the company unit cost.
Long-term enhancement	3.30	The £3.3m is justified in terms of scale to investigate the need for and appraisal of large supply options. However, we would expect this development to consider a range of options beyond the East Midlands reservoir, whose costs appear higher than several alternatives. It is expected that if the East Midlands reservoir or an alternative scheme meets the requirements of Direct Procurement for Customers (DPC) scheme consideration (such as the £100m whole-life totex threshold) and is ultimately deemed suitable it will be procured through the DPC process.
Strategic regional solution development	25.70	Joint development of River Severn-River Thames transfer (pipeline and canal) option. This enhancement allowance has been added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	0.00	None proposed
Leakage enhancement	0.49	Proposed leakage reduction is greater than 15% and therefore an enhancement allowance is made based on 0.9 MI/d of benefit and the company unit cost which is lower than the triangulated industry unit cost.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	127.6	
Company efficiency challenge	0.0%	

B. South West Water feeder model

Table B.1– SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	3.93	11.20	15.13	£11.20m reallocated from bespoke leakage enhancement line. Non-leakage expenditure assessed through a shallow dive as non-material.
Demand-side (dry year annual average)	3.73 (0.20)				

Table B.2– SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	29.94	29.94	17.7 MI/d of this to be delivered through leakage reduction assessed consistently with other companies. The remaining benefits are assumed to be associated with the expenditure that was non-material and was shallow dived, or associated with metering expenditure.
Demand-side (dry year annual average)	29.94		

Table B.3 – Disaggregated SDB enhancement costs and benefits

Not required for shallow dive details in Table B.1

Table B.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	3.93	Company's non-leakage supply-demand balance expenditure is not material, therefore, it has been evaluated through a shallow dive approach applying the company level efficiency
Leakage enhancement	0.00	The company does not forecast to achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore, no leakage enhancement allowance is made.
Total SDB enhancement (£m totex)	3.93	
Company efficiency challenge	0.0%	

C. United Utilities feeder model

Table C.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (4.72)	4.72	0.00	4.72	
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	50.00 (0.00)	51.04	0.00	51.04	
Demand-side (dry year annual average)	0.00 (1.04)				

Table C.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefit (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	67.20	67.20	
Demand-side (dry year annual average)	67.20		

Table C.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	5.72	0.00	N/A	Company proposes £4.7m opex associated with delivery of AMP6 enhancement and £1m opex for customer communications promoting water efficiency, but with no SDB benefit associated with either in the SDB enhancement table. (PR19 Data Table Commentary. Sup. Report S6022)
Long-term enhancement	0.00	N/A	N/A	None proposed
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	10.00	N/A	N/A	AMP6 carry-over for Thirlmere to West Cumbria transfer (PR19 Data Table Commentary, Doc Ref P0003)
Leakage enhancement	40.00	67.20	0.60	15% reduction but performance commitment is for 8.7% reduction (PR19 Data Table Commentary. Sup. Report S6022)
Investigations and future planning	0.00	N/A	N/A	None proposed

Table C.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	0.00	Insufficient justification for proposed enhancement expenditure relating to customer communications. Opex associated with projects delivered in the period 2015-20 is considered to be included in the base allowance.
Long-term enhancement	0.00	None proposed
Strategic regional solution development	25.70	Joint development of River Severn-River Thames transfer (pipeline and canal) option. This enhancement allowance has been added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	10.00	AMP6 carry-over for Thirlmere to West Cumbria transfer has the company efficiency challenge applied. The company claims that as <i>"98.7% of project milestones are scheduled to be completed within the current 2015-2020 price control period... continuing the (bespoke) outcome delivery incentive into AMP7 would not be proportionate."</i> If the scheme is not 100% complete and additional investment is needed we would expect the company to continue to ensure customers are protected for the efficient delivery of this scheme.
Leakage enhancement	0.00	The company does not forecast to achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore, no leakage enhancement allowance is made.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	35.70	
Company efficiency challenge	0.0%	

D. Anglian Water feeder model

Table D.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	75.71	505.00	580.71	Reallocation of £56.99m to new developments. Reallocation of 5.01m from resilience and £556.99m associated with the supply-side strategy
Supply-side (dry year annual average)	74.62 (1.09)				
Demand-side (dry year critical / peak)	0.00 (0.00)	238.60	-161.67	76.94	
Demand-side (dry year annual average)	168.99 (69.61)				

Table D.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefit (MI/d)	Comments
Supply-side (dry year critical / peak)	6.00	6.00	The 2020-25 benefits specified in the narrative is used because the 6.00 MI/d represents a net benefit across the region. In order to achieve this benefit a number of larger scale schemes linked to the transfers and associated treatment are required as identified in the revised draft WRMP.
Supply-side (dry year annual average)	6.00		
Demand-side (dry year critical / peak)	56.25	56.25	The demand-side benefits used are those associated with non-metering leakage reduction. The other benefits are associated with the expenditure assessed in the metering model feeder model. There is insufficient information provided to enable the separation of the expenditure and benefits to a lower level and split between the models.
Demand-side (dry year annual average)	55.75		

Table D.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	96.60	62.0	1.45	This is supply-side only as all of the demand reduction expenditure remaining following reallocation is associated with leakage. The supply-side costs are based on the totals in '10d Anglian Water Benchmarking'. Limited detail of the breakdown of the WRMP supply-side strategy expenditure is provided, therefore, an assumption is made based on the narrative information. We note that ~£6.7m of expenditure does not appear to be associated with the identified schemes. This has not been included in the unit cost calculation (£89.9m/62.0MI/d).
Long-term enhancement	18.70	N/A	N/A	Includes development of South Lincolnshire and North Fenland reservoirs, Severn-Trent Water trade, Felixstowe desalination, water reuse/river augmentation in Kings Lynn/Ipswich and continuation of Water Resources East (insufficient detail is provided to dissociate this into the future planning line below)
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	465.39	N/A	N/A	Limited breakdown of the WRMP supply-side strategy is provided therefore it is assumed any expenditure not associated with the supply or long-term enhancement schemes above is related to the significant interconnection investment.
Leakage enhancement	76.94	23.35	3.30	Identified in the 'Driving down the leakage frontier business case'. Benefits associated with metering have been removed.
Investigations and future planning	0.00	N/A	N/A	Insufficient detail provided to separate future planning expenditure from aggregated expenditure above.

Anglian Water SDB enhancement analysis

Table D.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	86.19	62.0 MI/d in identified 2020-25 supply-side benefits assessed at the industry median unit cost which is lower than the company unit cost.
Long-term enhancement	6.83	Insufficient evidence provided to justify the development of options identified. A development allowance (based on the South Lincolnshire reservoir, the costs being challenged against average industry scheme-type costs and the company efficiency) is provided. It is expected that if South Lincolnshire reservoir or an alternative scheme meets the requirements of Direct Procurement for Customers (DPC) scheme consideration (such as the £100m whole-life totex threshold) and is ultimately deemed suitable it will be procured through the DPC process.
Strategic regional solution development	10.34	Joint development of an eastern regional solution/transfer. Enhancement allowance added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	298.88	20% efficiency challenge applied due to the insufficient justification provided for the majority of scope. Company level efficiency is subsequently applied. Options <i>Central Lincolnshire WRZ to Nottinghamshire WRZ transfer</i> and <i>Norwich & the Boards WRZ to Happisburgh WRZ Transfer</i> have significantly higher costs than the forecast industry median unit cost. Expenditure is allocated at the industry forecast median unit cost and the company should investigate and provide further justification that the interconnection is the best value option. Further protection for customers required.
Leakage enhancement	36.48	The company is forecast to achieve beyond upper quartile leakage reduction performance in both normalised measures and therefore an enhancement allowance is made based on 22.8 MI/d of benefit and the triangulated industry unit cost which is lower than the company unit cost.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	438.71	
Company efficiency challenge	15.0%	

E. Bristol Water feeder model

Table E.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	6.02	0.00	6.02	
Demand-side (dry year annual average)	3.48 (2.54)				

Table E.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	0.00	6.69	
Demand-side (dry year annual average)	6.69		

Table E.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	0.00	0.00	N/A	None proposed
Long-term enhancement	0.00	N/A	N/A	None proposed
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	0.00	N/A	N/A	None proposed
Leakage enhancement	6.02	6.50	0.93	There is a slight variance (0.2 MI/d) between the leakage reduction figures and the demand benefits included as explanatory variables. We exclude this on grounds it can not be attributed to any activities.
Investigations and future planning	0.00	N/A	N/A	None proposed

Table E.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	0.00	None proposed
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	2.46	The company is forecast to achieve beyond upper quartile leakage reduction performance in both normalised measures and therefore an enhancement allowance is made based on 2.7 MI/d of benefit and the company unit cost which is lower than the triangulated industry unit cost.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	2.46	
Company efficiency challenge	7.2%	

F. Northumbrian Water feeder model

Table F.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	20.2	20.2	Reallocation from resilience line, the Hanningfield to Abberton interconnection
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	
Demand-side (dry year annual average)	0.00 (0.00)				

Table F.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	139.70	139.70	
Demand-side (dry year annual average)	139.70		

Table F.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (Ml/d)	Company unit cost (£m/Ml/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	0.00	139.7	N/A	Assumed to be per capita consumption (PCC) reduction benefits associated with metering all included within base operating expenditure.
Long-term enhancement	0.00	N/A	N/A	None proposed
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	20.40	N/A	N/A	Abberton to Hanningfield main reallocated from resilience, £20.2m capex, £0.2m opex (<i>Appendix 3.2 Resilience Case</i>)
Leakage enhancement	0.00	31.7	N/A	15.8% leakage reduction assume all costs presented within base operating expenditure.
Investigations and future planning	0.00	N/A	N/A	None proposed

Table F.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	0.00	None proposed
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	We find insufficient evidence the proposed interconnection is necessary or provides benefit to customers. We have not made an allowance for this expenditure.
Leakage enhancement	2.50	Proposed leakage reduction is greater than 15% and therefore an enhancement allowance is made based on 1.6 MI/d of benefit and the triangulated industry unit cost which is lower than the company unit cost.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	2.50	
Company efficiency challenge	0.03%	

G. Portsmouth Water feeder model

Table G.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	64.91	0.00	64.91	
Supply-side (dry year annual average)	64.91 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	1.55	0.00	1.55	
Demand-side (dry year annual average)	1.55 (0.00)				

Table G.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	26.80	20.30	The benefits identified are not clearly linked to the proposed expenditure and therefore the benefits from the revised draft WRMP were used for the schemes identified in the data table commentary
Supply-side (dry year annual average)	20.30		
Demand-side (dry year critical / peak)	0.00	0.00	No benefits recorded despite leakage reduction being proposed and demand-side expenditure being identified
Demand-side (dry year annual average)	0.00		

Table G.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	2.66	14.30	0.19	£2.66m capex associated with borehole projects, Funtington and World's End. Benefits have been derived from revised draft WRMP Table 5 and aligned to the schemes specified in data table commentary WS2. It is unclear how the benefits associated with the named schemes add up to those presented in the business plan tables. However, use of the business plan table figure has no material impact on the assessment
Long-term enhancement	62.25	N/A	N/A	£62.25m capex for Havant Thicket reservoir construction (<i>Business Plan Appendix 8.2</i>)
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	0.00	N/A	N/A	None proposed
Leakage enhancement	1.55	4.70	0.33	£1.55m opex specified to deliver 15.2% reduction specified in Table WN2 Line 25: from 34.9 MI/d in 2019-20 to 29.6 MI/d in 2024-25 (<i>AMP7-WS2 Data Tables Commentary TH</i>).
Investigations and future planning	0.00	N/A	N/A	None proposed

Table G.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	2.66	14.3 MI/d in identified 2020-25 SDB benefits applied to company unit cost which is lower than the industry median unit cost.
Long-term enhancement	56.84	Havant Thicket reservoir development. Benefit review based on the information provided in the revised draft WRMP planning table - the Portsmouth zone carries a surplus of greater than 2 MI/d through the planning period and therefore the cost allowance has been factored on a 21/23 basis reflecting the fact that the benefits (2 MI/d) in excess of those required by Southern Water (21 MI/d) are not fully justified.
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	0.02	Proposed leakage reduction is greater than 15% and therefore an enhancement allowance is made based on 0.1 MI/d of benefit and the company unit cost which is lower than the triangulated industry unit cost.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	59.52	
Company efficiency challenge	0.00%	

H. South East Water feeder model

Table H.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	14.85 (0.173)	31.70	0.00	31.70	Reallocation of £58.27m to new developments enhancement
Supply-side (dry year annual average)	16.50 (0.18)				
Demand-side (dry year critical / peak)	42.23 (9.03)	102.52	58.27	44.25	
Demand-side (dry year annual average)	42.23 (9.03)				

Table H.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	18.18	18.18	
Supply-side (dry year annual average)	17.35		
Demand-side (dry year critical / peak)	26.61	26.61	
Demand-side (dry year annual average)	26.61		

Table H.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	33.07	32.20	1.03	£26.2m capex for Aylesford Newsprint groundwater scheme providing 18.2 MI/d, and £6.8m opex for water efficiency programme delivering 14.0MI/d (<i>BP Appendix 11</i>).
Long-term enhancement	8.91	N/A	N/A	Arlington and Broad Oak reservoirs plus £4.351m for WRZ6 zonal solution (<i>BP Appendix 11</i>). The WRZ6 zonal costs have been adjusted down from £5.2m in the narrative, in order to reconcile the total expenditure with table WS2 values.
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	2.36	N/A	N/A	Company transfers WRZs 1 to 7 and 7 to 2 (<i>BP Appendices 11 & 7</i>)
Leakage enhancement	29.61	12.60	2.35	£29.6m opex specified in business plan Appendix 11. 14.4% reduction specified in Table WN2 Line 25: from 87.7 MI/d in 2019-20 to 75.1 MI/d in 2024-25.
Investigations and future planning	2.0	N/A	N/A	WRMP24 development capex

South East Water SDB enhancement analysis

Table H.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (£m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	33.07	The company specifies 18.2 MI/d of supply-side benefits and 14 MI/d water efficiency benefit, which are consistent with the options in its draft WRMP. The company unit cost is lower than industry median. Therefore, the company proposed costs are allowed in full.
Long-term enhancement	8.64	The company specifies £4.6m development costs for longer-term investment in two new reservoirs for delivery by 2033 and 2035, and £5.2m for a WRZ6 intrazonal enhancement scheme. The justification of the intrazonal investment is limited and therefore an additional efficiency challenge of 20% has been applied at this stage. We consider £4.6m to be appropriate for development of supply options, but find insufficient evidence that the reservoirs proposed are the best value options available. We therefore expect development of a broader range of options to be undertaken. The company level efficiency challenge (0.86%) is then applied to determine an overall allowance of £8.64m.
Strategic regional solution development	0.00	None proposed
Internal interconnections	2.34	Costs and timing of interzonal transfers align with draft WRMP19. Company efficiency applied to proposed enhancement cost.
Leakage enhancement	4.91	The company is forecast to achieve beyond upper quartile leakage reduction performance in both normalised measures and therefore an enhancement allowance is made based on 3.1 MI/d of benefit and triangulated industry unit cost which is lower than the company unit cost.
Investigations and future planning	0	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	48.97	
Company efficiency challenge	0.86%	

I. South Staffs Water feeder model

Table I.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.61	2.27	2.88	Reallocation of £2.27m from resilience for borehole return to service
Supply-side (dry year annual average)	0.61 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	13.21	0.00	13.21	
Demand-side (dry year annual average)	9.81 (3.40)				

Table I.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	6.22	6.22	2.30 MI/d of benefit in 2020-21 is not clearly linked to the proposed expenditure and therefore has not been included in the further assessment
Supply-side (dry year annual average)	6.22		
Demand-side (dry year critical / peak)	24.10	24.10	
Demand-side (dry year annual average)	24.10		

Table I.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (Ml/d)	Company unit cost (£m/Ml/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	6.56	4.94	1.33	Supply-side options, £2.88m capex associated with a new borehole and reintroduction of groundwater sources. Demand side water efficiency £3.69m in the narrative does not reconcile with the business plan table and therefore is proportioned to total table WS2 figures (<i>Appendix A29 Capital investment to deliver a class leading service</i>). Supply side benefits derived by reference to revised draft WRMP. Non-leakage demand benefits have been assumed to be proportioned between metering and water efficiency expenditure
Long-term enhancement	0.00	N/A	N/A	None proposed
Strategic regional solution development	0.00	N/A	N/A	None proposed
Internal interconnections	0.00	N/A	N/A	None proposed
Leakage enhancement	9.53	19.60	0.49	Leakage expenditure identified in Appendix A29 Capital investment to deliver a class leading service. Demand side opex in narrative does not reconcile with the business plan table and therefore is proportioned to total table WS2 figures. Leakage benefits confirmed from business plan table and company presentation pro-forma.
Investigations and future planning	0.00	N/A	N/A	None proposed

Table I.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (£m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	6.56	We have validated 3.92 MI/d of supply side benefits and calculated 1.0 MI/d of water efficiency benefit. Total benefit of 4.92 MI/d. The company unit cost is lower than industry median. Therefore, the company proposed costs are allowed in full.
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	3.40	Proposed leakage reduction is greater than 15% and therefore an enhancement allowance is made based on a benefit of 7.0 MI/d and the company unit cost which is lower than the triangulated industry unit cost.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	9.97	
Company efficiency challenge	6.9%	

J. SES Water feeder model

Table J.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	Reallocation of £3.68m capex to new developments, and £14.95m capex and £2.49m opex from bespoke leakage lines.
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	6.27	13.76	20.03	
Demand-side (dry year annual average)	3.68 (2.59)				

Table J.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (Ml/d)	Business plan table aggregated benefits (Ml/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	8.64	8.64	
Demand-side (dry year annual average)	8.64		

Table J.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	2.59	2.27	1.14	Narrative describes non-metering water efficiency delivering 45% of the 7.3% reduction in per capita consumption (PCC) from 2020 to 2025 (45% of 8.6MI/d), with 55% resulting from metering. Remaining demand opex once leakage opex (£2.49m) is removed, £2.59m.
Long-term enhancement	0.00	0.00	N/A	None proposed
Strategic regional solution development	0.00	0.00	N/A	None proposed
Internal interconnections	0.00	0.00	N/A	None proposed
Leakage enhancement	17.44	3.60	4.85	£14.95m bespoke leakage enhancement capex and £2.5m opex (<i>Business plan p.107-108</i>).
Investigations and future planning	0.00	N/A	N/A	None proposed

Table J.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	2.59	2.27 MI/d in identified 2020-25 SDB benefits applied to company unit cost, which is lower than the industry median. The benefits align with draft WRMP customer and regulatory expectations.
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	0.00	The company does not achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore no leakage enhancement allowance is made.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	2.59	

Company efficiency challenge	9.1%
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K. Welsh Water feeder model

Table K.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	21.85	5.83	27.69	Reallocation of £5.83m from Resilience enhancement
Supply-side (dry year annual average)	20.85 (1.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	0.00	70.30	70.30	Reallocation of £70.3m from bespoke enhancement line for leakage
Demand-side (dry year annual average)	0.00 (0.00)				

Table K.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	13.62	13.62	
Supply-side (dry year annual average)	11.44		
Demand-side (dry year critical / peak)	0.00	0.00	
Demand-side (dry year annual average)	0.00		

Table K.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	18.90	5.10	3.71	The presented benefits for SDB enhancement are inconsistent and do not match the specified schemes. 5.1 MI/d is the 2025 deficit specified in the revised draft WRMP19 narrative (despite surplus in the revised draft WRMP tables).
Long-term enhancement	0.0	N/A	N/A	None proposed.
Strategic regional solution development	0.0	N/A	N/A	None proposed.
Internal interconnections	5.83	N/A	N/A	Reallocated from resilience: Hereford to Vowchurch transfer for severe drought. (<i>Draft WRMP Appendix 19; Business Plan report 1.2 Water Service Table Commentaries</i>)
Leakage enhancement	70.3	25.5	2.76	Bespoke enhancement capex line A26. Includes customer side losses and lead supply replacement benefits (<i>BP Presentation Proforma Table 2.2; Supporting Doc "Ref 5.8J" Section 4</i>)
Investigations and future planning	2.96	N/A	N/A	£0.70m capex for production of the Drought Plan, including environmental studies, and £2.26m capex for WRMP planning.

Table K.5 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	7.09	5.1 MI/d identified as 2020-25 benefits in revised draft WRMP which is applied to industry unit cost which is lower than the company unit cost.
Long-term enhancement	0.00	None proposed.
Strategic regional solution development	0.00	None proposed.
Internal interconnections	0.00	Insufficient evidence that Vowchurch resilience scheme is required.
Leakage enhancement	0.24	Proposed leakage reduction is greater than 15% and therefore a marginal enhancement allowance is made based on a benefit of 0.2 MI/d and the triangulated industry unit cost which is lower the company unit cost.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	7.33	
Company efficiency challenge	0.0%	

L. Wessex Water feeder model

Table L.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	Reallocation of £19.85m capex and £5.49m opex from bespoke leakage line.
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	2.85	25.34	28.19	
Demand-side (dry year annual average)	2.85 (0.00)				

Table L.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (Ml/d)	Business plan table aggregated benefits (Ml/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	18.96	18.96	
Demand-side (dry year annual average)	18.56		

Table L.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	2.85	5.00	0.57	Water efficiency benefits with remaining non-leakage benefits assumed to be associated with metering (<i>PR19 Table WS4 Wholesale water Other (explanatory variables) Commentary, P5, Supporting document 5.2 – Using water efficiently</i>)
Long-term enhancement	0.00	0.00	N/A	None proposed
Strategic regional solution development	0.00	0.00	N/A	None proposed
Internal interconnections	0.00	0.00	N/A	None proposed
Leakage enhancement	25.34	10.49	2.42	The company has included a bespoke enhancement expenditure line and a cost claim associated with leakage reduction, table WS2, lines 25, 64. The cost claim has been rejected because the leakage allocation has been assessed consistently with other companies through this model. Leakage benefits as described in narrative with metering benefits removed (<i>Appendix 8.8.A – Claim WSX04 – Reducing leakage by a further 15%</i>)
Investigations and future planning	0.00	N/A	N/A	None proposed

Table L.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	2.85	5.0 MI/d in identified 2020-25 SDB benefits applied to company unit cost, which is lower than the industry median.
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	0.00	The company does not achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore, no leakage enhancement allowance is made.
Investigations and future planning	0.00	None proposed
Total SDB enhancement (£m totex)	2.85	
Company efficiency challenge	0.0%	

M. Yorkshire Water feeder model

Table M.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.34	0.00	0.34	Reallocation of £131.94m capex and £118.05m opex from bespoke leakage enhancement lines
Supply-side (dry year annual average)	0.34 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	0.00	249.99	249.99	
Demand-side (dry year annual average)	0.00 (0.00)				

Table M.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	2.00	
Supply-side (dry year annual average)	2.00		
Demand-side (dry year critical / peak)	0.00	59.50	
Demand-side (dry year annual average)	59.50		

Table M.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	0.34	2.00	0.17	Groundwater enhancement (<i>Draft WRMP19. BP Appendix 8f</i>)
Long-term enhancement	0.00	0.00	N/A	None proposed
Strategic regional solution development	0.00	0.00	N/A	None proposed
Internal interconnections	0.00	0.00	N/A	None proposed
Leakage enhancement	250.00	59.5	4.20	Bespoke enhancement £132m capex and £118m opex
Investigations and future planning	0.00	N/A	N/A	None proposed

Table M.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	0.00	Insufficient justification of need for enhancement expenditure.
Long-term enhancement	0.00	None proposed
Strategic regional solution development	0.00	None proposed
Internal interconnections	0.00	None proposed
Leakage enhancement	39.03	Proposed leakage reduction is greater than 15% and therefore a marginal enhancement allowance is made based on a benefit of 24.4 Ml/d and the triangulated industry unit cost which is lower than the company unit cost.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	39.03	

Company efficiency challenge	10.3%
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N. Affinity Water feeder model

Table N.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0 (0.00)	78.89	-0.6	78.29	Reallocation of £0.6m to resilience enhancement
Supply-side (dry year annual average)	78.89 (0.00)				
Demand-side (dry year critical / peak)	0	110.81	-4.46	106.35	Reallocation of £3.1m to metering and £1.4m to resilience enhancement
Demand-side (dry year annual average)	69.43 (41.38)				

Note: the non-leakage demand-side opex is not clearly broken down between metering and efficiency/behavioural change in the business plan narrative. Here we assume this breakdown is proportional to the capex breakdown, such that £0.29m opex is associated with the 'Water Saving Programme' and remaining is reallocated to metering enhancement.

Table N.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	5.30	5.86	
Supply-side (dry year annual average)	4.88		
Demand-side (dry year critical / peak)	63.77	63.8	
Demand-side (dry year annual average)	63.77		

Table N.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancements (supply-side and non-leakage demand)	69.00	44.95	1.54	£5.54m capex for delivery of Luton Greensand abstraction with 5.9 MI/d associated benefit (<i>Appendix 6</i>). £57.48m capex and £5.98m opex for water efficiency and behavioural change demand enhancement, with 39.05 MI/d benefit specified in business plan (<i>Appendix 6</i>). 4% water saving programme costs (£3.1m) reallocated to metering enhancement.
Long-term enhancement	47.89	N/A	N/A	£36.67m capex specified for “Supply 2040” removal of network constraints and £11.22m capex for “conditioning treatment” to enable maximum peak exploitation of existing Anglian Water import. (<i>Appendix 6</i>)
Strategic regional solution development	18.49	N/A	N/A	Preparation for a regional reservoir by 2037 with Thames Water. (<i>Appendix 6</i>)
Internal interconnections	0.00	0.00	N/A	None proposed for the period 2020-25.
Leakage enhancement	35.11	24.33	1.44	£35.1m opex specified in business plan Appendix 6. 15% reduction specified in Table WN2 Line 25: from 162.2 MI/d in 2019-20 to 137.9 MI/d in 2024-25.
Investigations and future planning	14.16	N/A	N/A	Capex for WRSE & WRMP development & feasibility studies, and ‘increasing abstraction’.

Table N.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	62.50	44.95 MI/d in identified 2020-25 SDB benefits applied to industry unit cost which is lower than the company unit cost.
Long-term enhancement	38.10	This will assist in resolving potential localised deficits by 2030. However, the justification of the Supply 2040 investment is limited and therefore an additional efficiency challenge of 20% has been applied at this stage. The company level efficiency challenge is then applied to both this and the conditioning treatment enhancement, to determine the allowance.
Strategic regional solution development	70.90	Joint development of Abingdon Reservoir, a regional transfer from Thames Water to Southern Water and Affinity Water, and an eastern regional solution/transfer. This enhancement allowance has been added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	0.00	None proposed for the period 2020-25.
Leakage enhancement	0.00	The company does not achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore, no leakage enhancement allowance is made.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	171.51	
Company efficiency challenge	6.1%	

O. Hafren Dyfrdwy feeder model

Table 0.1– SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	
Supply-side (dry year annual average)	0.00 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	0.00	0.00	0.00	
Demand-side (dry year annual average)	0.00 (0.00)				

Table 0.2– SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan aggregated benefits (MI/d)	Comments
Supply-side (dry year critical / peak)	0.00	0.00	All related to metering enhancement only.
Supply-side (dry year annual average)	0.00		
Demand-side (dry year critical / peak)	1.90	1.90	
Demand-side (dry year annual average)	1.90		

Table 0.3 – Disaggregated SDB enhancement costs and benefits

Not required for shallow dive details in Table O.1

Table 0.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
Total SDB enhancement (£m totex)	0.00	

P. Southern Water feeder model

Table P.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	34.69 (1.00)	264.55	0.00	264.55	
Supply-side (dry year annual average)	228.86 (0.00)				
Demand-side (dry year critical / peak)	0.00 (0.00)	79.76	0.00	79.76	
Demand-side (dry year annual average)	46.64 (33.12)				

Table P.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (MI/d)	Business plan table aggregated benefit (MI/d)	Comments
Supply-side (dry year critical / peak)	83.80	83.80	We used the plan narrative to associate the expenditure requested with the appropriate benefits. This does not reconcile with the value presented here which appears to include benefits associate with expenditure that is assessed through other models such as catchment management schemes.
Supply-side (dry year annual average)	72.54		
Demand-side (dry year critical / peak)	37.68	37.68	The demand side benefits have been associated with leakage reduction, water efficiency and metering expenditure based upon the information provided in the plan narrative.
Demand-side (dry year annual average)	30.90		

Table P.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	51.76	33.36	1.55	Based on the proposed delivery, expenditure and benefits associated with supply schemes (<i>PR19 Business Plan Data Tables supporting commentary September 2018 – Resubmission 28th September 2018 & TA 11.WN01 Supply Demand Balance, Appendix 1</i>). Non-leakage demand benefits have been assumed to be proportioned between metering and water efficiency expenditure as part of Target 100 water efficiency activity. £1m opex has been associated with this component but it is not clear what benefit it is associated with and therefore it has not been included in the unit cost calculation (51.76/33.36)
Long-term enhancement	83.38	N/A	N/A	Includes supply-side options to be delivered beyond 2025 (<i>PR19 Business Plan Data Tables supporting commentary September 2018 – Resubmission 28th September 2018 & TA 11.WN01 Supply Demand Balance, Appendix 1</i>).
Strategic regional solution development	89.36	N/A	N/A	We consider that the development of the Fawley desalination option represents an alternative to a strategic regional solution
Internal interconnections	70.75	N/A	N/A	Includes projects relating to the development of the Hampshire grid
Leakage enhancement	33.12	16.00	2.07	Based on benefits and expenditure identified in TA 11.WN04 Water Networks.
Investigations and future planning	15.93	N/A	N/A	WRMP planning capex and opex expenditure related to NEUBs and TUBs and projects delivered in 2015-20.

Table P.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	46.38	36.36 MI/d in identified 2020-25 SDB benefits assessed at the industry median unit cost which is lower than the company unit cost.
Long-term enhancement	73.47	Where possible options costs are challenged against average industry scheme-type costs. We note that there is uncertainty regarding the need for these schemes and that the deficit faced will depend on the outcome of further investigations. Due to this uncertainty further protection for customers is required. Costs have been challenged with the company level efficiency.
Strategic regional solution development	75.28	Joint development of regional solutions with other companies and further development of the Fawley desalination option. Enhancement allowance added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	50.94	20% efficiency challenge applied due to the insufficient justification provided for the majority of scope. Company level efficiency was subsequently applied. Further protection for customers required
Leakage enhancement	0.00	The company does not achieve beyond upper quartile performance and the proposed leakage reduction does not exceed 15%, therefore, no leakage enhancement allowance is made.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	246.06	
Company efficiency challenge	10.0%	

Q. Thames Water feeder model

Table Q.1 – SDB enhancement costs presented in PR19

Enhancement type	Business plan table costs – capex (opex) (£m)	Business plan table aggregated cost (totex £m)	Net reallocations (totex £m)	Aggregated costs assessed for SDB (totex £m)	Comments
Supply-side (dry year critical / peak)	5.52 (0.00)	90.08	0.00	90.08	
Supply-side (dry year annual average)	82.63 (1.94)				
Demand-side (dry year critical / peak)	4.33 (21.53)	222.14	0.00	222.14	
Demand-side (dry year annual average)	119.43 (76.85)				

Table Q.2 – SDB enhancement benefits presented in PR19

Enhancement type	Business plan table benefits (Ml/d)	Business plan table aggregated benefit (Ml/d)	Comments
Supply-side (dry year critical / peak)	38.60	38.60	These benefits are assessed for supply schemes in 2020-25
Supply-side (dry year annual average)	38.60		
Demand-side (dry year critical / peak)	166.16	166.16	These benefits are split between leakage, metering and water efficiency based upon the information provided in the plan narrative, PCD5 Water Network Plus Price Control.
Demand-side (dry year annual average)	162.06		

Table Q.3 – Disaggregated SDB enhancement costs and benefits

SDB enhancement breakdown	Costs (totex £m)	Benefits (MI/d)	Company unit cost (£m/MI/d)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	105.88	72.09	1.47	Supply side benefits are assumed to be as identified in the business plan tables and PR19–CSD006-WNP-03b. Noting that the preferred options have changed, the supply side expenditure is assumed to be the totex in the supply lines not associated with long term enhancement or regional schemes. Non-leakage and metering expenditure and benefits identified from PCD5 Water Network Plus Price Control
Long-term enhancement	5.60	N/A	N/A	Development of Deephams treatment and transfer (<i>PR19–CSD006-WNP-03b</i>)
Strategic regional solution development	30.80	N/A	N/A	Development of Abingdon Reservoir as identified in PR19–CSD006-WNP-03b
Internal interconnections	0.00	N/A	N/A	None proposed
Leakage enhancement	156.70	42.40	3.70	Leakage benefits associated with expenditure in the SDB enhancement lines as identified in PCD5 Water Network Plus Price Control. Further leakage benefits are associated with expenditure in the metering feeder model and the cost adjustment claim, WN601001, Incremental cost of water stress on balancing supply / demand. Note that 21 MI/d of benefit associated with expenditure in 2015-20 is excluded
Investigations and future planning	13.20	N/A	N/A	WRMP and water resources south east development

Table Q.4 – Disaggregated SDB enhancement cost allocation

SDB enhancement breakdown	IAP cost allocation (totex £m)	Notes
2020-25 enhancement (supply-side and non-leakage demand)	100.21	72.09 MI/d in identified 2020-25 SDB benefits assessed at the industry median unit cost which is lower than the company unit cost.
Long-term enhancement	4.87	Proposed developments with company level efficiency challenge applied. It is expected that if the Deephams reuse or an alternative scheme meets the requirements of Direct Procurement for Customers (DPC) scheme consideration (such as the £100m whole-life totex threshold) and is ultimately deemed suitable it will be procured through the DPC process.
Strategic regional solution development	150.46	Joint development of regional solutions with other companies and further development of the Teddington reuse option. Enhancement allowance added in line with the policy decisions described in Section 5 of this slide pack.
Internal interconnections	0.00	None proposed
Leakage enhancement	3.09	Proposed leakage reduction is greater than 15% and therefore an enhancement allowance is made based on a benefit of 1.9 MI/d and the triangulated industry unit cost which is lower than the company unit cost.
Investigations and future planning	0.00	Costs are considered base allowance as part of normal company activity to maintain supply-demand balance and meet statutory obligations
Total SDB enhancement (£m totex)	258.63	
Company efficiency challenge	13.0%	