

Strategic Regional Water Resource Solutions: Annex H: Efficiency of Gate 2 Spend and Forecast

Standard Gate Two Submission for River Severn to River Thames Transfer (STT)

Date: November 2022



Severn to Thames Transfer

Efficiency of Gate 2 spend and forecast

STT-G2-S6-601

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Disclaimer

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1 Introduction and Purpose

- 1.1 This document supplements information provided in the Gate 2 main report, chapter 11, 'Efficiency of gate two expenditure and forecast', providing additional information relating to Gate 2 expenditure and projected Gate 3 and Gate 4 costs.
- 1.2 The STT scheme remains one the most complex in the RAPID SRO programme. It is delivered through three equally funded partner companies (two 'sellers' and one 'buyer'). There are integral dependencies with the three source SROs, two regional interfaces (one 'donor' and one 'recipient' region) and it affects both England and Wales with associated stakeholder and legislative considerations. There is a requirement for an over-arching 'system' view to be taken across a range of engineering, environmental, consenting, permitting and commercial considerations.
- 1.3 As was the case at Gate 1, the scheme has continued to employ programme structures, processes and partner governance that reflects the complexity and multi-partner involvement and promotes efficient Gate 2 delivery.
- 1.4 The workstream activities are solely in respect of specific STT SRO activities. Costs for other SRO activities and other company activities, including regional and WRMP24 planning, are not included in expenditure for STT Gate 2 activities.
- 1.5 All expenditure is reported at a 17/18 cost base unless otherwise stated.
- 1.6 The Gate 2 expenditure has been subject to both internal and external third-party assurance which has verified the efficient and relevant expenditure of STT Gate 2 activities. This has separately been reviewed by the companies in support of Board approvals for the Gate 2 submission.

2 Summary of expenditure for Gate 2

- 2.1 The STT SRO has been efficiently delivered within the budget for Gate 2, with an underspend against the Gate 2 final determination allocation of circa 30%.
- 2.2 The RAPID budget for the STT SRO at Gate 2 is £9.99m (2017 / 2018 price base) and is shared in equal thirds between the three STT partner companies.
- 2.3 The total cumulative expenditure for Gate 1 and Gate 2 activities is summarised below.

Table 2-1: Summary of Gate 1 and 2 expenditures

Activity	Funding allowance (£,000) 2017/18 price base	Expenditure (£,000) Actuals	Expenditure (£,000) 2017/18 price base	Percentage of expenditure against funding allowance
Gate 1 actual expenditure	£6,660	£4,494	£4,014	60%
Gate 2 forecast expenditure	£9,990	£7,865	£7,205	72%
Total	£16,650	£12,360	£11,219	67%

- 2.4 A breakdown of Gate 2 expenditure is provided in Appendix A of this report. Incurred costs for the gate activity are presented in the 2017/2018 price base and in accordance with the RAPID Gate 2 efficiency of spend template. Additional breakdown is provided in the table for any spend categories that exceed £0.5 million in value.
- 2.5 For comparison with the Final Determination allowance, actual costs are deflated back to a 2017/18 cost base using Thames Water’s Internal Business Plan (IBP) deflationary factors, based upon the CPIH (November 2019 dataset) index.

Table 2-2 Deflationary factors used for actual cost calculations

AMP7	Deflation Factors *
Year 1 (2020/21)	0.9469
Year 2 (2021/22)	0.9283
Year 3 (2022/23)	0.9102

* from actual costs back to 2017/18 cost base

- 2.6 Where applicable, company overhead has been charged to the elements of the companies’ STT spend, with the overhead then allocated in proportion to workstream costs.
- 2.7 It should be noted that the Gate 2 expenditure, whilst reflecting the partners’ best estimate of Gate 2 out-turn expenditure is an estimate only and may be subject to adjustment. The estimate is based on actual costs recorded through to end July 2022, plus forecast costs through to 14th November 2022 including risk provisions for additional work and cost uncertainties.
- 2.8 The scheme has a circa 30% underspend of the Gate 2 funding allowance. Whilst noting development of the scheme is an ongoing process there are no identified gaps or incomplete work from the defined RAPID Gate 2 scope.

3 Programme structure and approach

Overall structure and working arrangements

- 3.1 The project structure is illustrated in Figure 3-1. This structure provides clear lines of communication and responsibility, with project assurance and governance to ensure appropriate oversight, challenge and efficient decision making.

Figure 3-1 STT overall project structure



- 3.2 A more detailed representation of the project structure is provided in appendix B.
- 3.3 Scopes of work were prepared and delivered through the various workstreams leads. Technical leads and company subject matter experts provided technical review, with overall oversight provided through the programme manager. Decisions were reviewed and authorised by the Programme Management Board (PMB) through the weekly and monthly meetings. An assurance working group supports the PMB and ensures appropriate levels of assurance. The assurance group also supported company audit committees and company board assurance processes. Any decisions outside of PMB's delegation were referred to the Programme Steering Group.
- 3.4 Weekly progress meetings were held to ensure good communication and timely decision making across partners. A monthly engineering and environmental technical meeting provided technical oversight and co-ordination. A PMB meeting was held monthly where progress was reviewed, key decisions made, or ratified, and key issues discussed. The PMB report to and can escalate issues to the Programme Steering Group (PSG) if required.
- 3.5 The above inter-company arrangements are under-pinned by a Memorandum of Understanding and Procurement Side Letter produced at Gate 1. Procurement guidelines were also produced setting-out how STT services would be procured across the three companies utilising the water company frameworks. This documentation whilst suitable for Gate 2 will need to be updated to reflect the new working arrangements proposed ahead of Gate 3.
- 3.6 A joint team was formed that avoided duplication of effort or a siloed approach, utilised the strengths of the team members and fostered an environment of collaboration and joint decision making between the three companies to provide effective and efficient delivery.
- 3.7 It should be noted that the structure will be developed for Gate 3 activities to reflect the proposed system coordination, interconnector and bypass activities (refer to chapter 7 of the STT Gate 2 main report).

Governance and programme direction

- 3.8 Central to the efficient delivery of the scheme has been the decision to undertake a joint, collaborative working approach to the delivery of the scheme for Gate 1 and Gate 2 activities.
- 3.9 A small core 'tripartite' team was established from representatives of the three partner companies to provide programme direction and governance, with authority and decision making made jointly within the team. This approach is represented in the project structure by the Programme Management Board (PMB) comprising representatives from each company.
- 3.10 The significance, complexity and risk profile of the STT scheme warrants that each company has senior representation on the governance and decision making for the scheme. The deployment of senior staff by all three companies provides governance efficiency, with accountable senior staff able to make executive decisions without protracted in-company sign-off processes.
- 3.11 Each company committed part-time resources typically comprising an SRO lead and SRO strategy manager, with technical support.
- 3.12 Programme governance activities were similar to those undertaken at Gate 1, except mobilisation activities from Gate 1 into Gate 2 were minimal. There was also increased focus at Gate 2 on commercial aspects of project both the long-term commercial operation and roles and responsibilities for consenting and procurement post Gate 2. These commercial and delivery considerations have necessitated increased company inputs in this area.
- 3.13 A summary of the breakdown of the principal governance and tripartite activities estimated level of effort is provided in appendix C.

Programme Management

- 3.14 Programme management was provided through a competitively procured senior, independent programme manager. This role was supported where required by part-time resource principally leading cost reconciliation and forecasting activities. The Programme Manager position was procured following a tendering process at Gate 1 utilising all three companies' frameworks. To provide continuity and efficiency this commission was extended under the same tendered commercial terms into Gate 2.
- 3.15 The programme management activities were largely similar to those undertaken at Gate 1 with increased focus on managing the development of post Gate 2 commercial and delivery activities.
- 3.16 A breakdown of the principal programme management activities and estimated level of effort is provided in appendix C

Scoping and gap analysis

- 3.17 As part of the process of ensuring the Gate 2 activities were relevant and appropriately scoped, a work breakdown structure was prepared, and principal deliverables identified against the Gate 2 requirements.
- 3.18 As the scheme progressed, the scope was developed and checked to ensure activities remained appropriate to meeting the Gate 2 requirements. As various lead suppliers were appointed (engineering, environmental advisor, consents lead) they were initially tasked with reviewing the Gate 2 scope to identify any gaps or scope deficiencies. This provided a useful check of the scope of work packages for Gate 2.
- 3.19 Packages for procurement were reviewed by company subject matter experts, oversight at monthly technical meetings and signed-off by the PMB.

Supply chain procurement approach

- 3.20 Three key principles were applied to ensure efficient procurement of work packages for Gate 2:
- Procurement through company frameworks and competitive procurement process, wherever possible, as set out in the STT scheme procurement guidelines developed for Gate 1
 - Procurement across SROs for aligned work packages (e.g., water quality and in-river investigations) to ensure consistency, value, and avoid duplication of effort.
 - 3-way company procurement team oversight to all STT procurement activities and PMB oversight and approval
- 3.21 The competitive framework procurement process ensured the majority of costs were benchmarked. The selection of consultants was based on quality and cost criteria. The weighting of quality versus cost was based on the technical complexity of each work package and the technical risk to the programme. Overall, this approach ensured the most commercially advantageous procurement for the SRO programme, balancing cost efficiency against ensuring quality of output.

Monitoring and reconciliation of Gate 2 expenditure

- 3.22 The three partner companies were jointly and equally responsible for the monitoring and reported Gate 2 expenditure. The costs incurred by each of the three companies were regularly reviewed (generally monthly), challenged and reconciled. This provided:
- a record of what the expenditure had been undertaken and committed,
 - validation of the appropriateness of the spend and,

- A running record of how monies would be allocated between the companies at the end of the Gate 2 activities.

3.23 At the end of Gate 2 a final account will be prepared, with individual company expenditure reconciled against the final account. This is planned to be completed by 31st March 2023. Monies will then be transferred such that all spend for Gate 2 is shared appropriately between the three partner companies.

Third party costs

3.24 Various charges from third parties were accrued against the project during the course of the Gate 2 activities as summarised below. It was not possible to tender these services which were provided by the organisations' personnel. NAU arrangements were scrutinised at a pan-SRO level by the All Company Working Group.

Table 3-3 Third party services and controls

Third Party	Description of services and controls
National Advisory Service (NAU)	EA and NE national level advice and support. Structured charging regime, rates and governance agreed through the All Company Working Group (ACWG) and RAPID
NRW, EA, NE, DWI area team inputs	Area support agreed with the local teams to meet specific STT activity needs and charged either through NAU invoicing or directly. Forecast charges are agreed against planned activities and actual cost reviewed prior to payment.
Regional Water Resource Groups (WRSE / WRW)	Limited charges to SROs from the regions for specific STT SRO modelling and environmental assessments for STT as agreed at the Regional Co-ordination and All Company Working Groups.

Workstream delivery

Competitive framework procurement

3.25 Technical workstreams included programme management, systemwide engineering, interconnector, Shrewsbury and bypass options appraisal and engineering, environmental monitoring and assessments, water resource appraisal, planning consents and land, permitting strategy, commercial delivery and procurement strategy (DPC), stakeholder and customer engagement and assurance. These activities comprise the majority of the SRO expenditure.

3.26 Workstream delivery was primarily competitively procured through company framework suppliers plus some limited use of in-company resource where there were available resources, skills and experience.

3.27 Out of the total Gate 2 forecast expenditure, after third party, company staff and overheads and other costs, a total of circa £5m was potentially available for competitive procurement of technical workstream packages. Procurement of these technical workstream packages for Gate 2 has been undertaken entirely off company framework agreements, with 85% of this activity procured competitively.

Direct award contracts

3.28 Non-competitive (direct award) procurement whilst not preferred was undertaken where assessed as efficient. This comprised expenditure in a number of areas:

- **Continuation of River Severn losses investigation, H R Wallingford (HRW)** –For the River Severn losses work HRW had previously developed the losses methodology, working closely with stakeholders. Gate 2 tasks developed and fed into the Gate 1 work and competitively procuring this work would have been highly disruptive to the quality, continuity, and programme delivery. It was assessed as more efficient to maintain delivery through HRW.
- **Deployable Output and stochastics assurance review, Atkins** – for this specialist assurance activity it was more efficient for Atkins to do the work because they were experienced with the WRSE stochastics and had access to the WRSE Pywr models. As a consequence, Atkins were uniquely placed to undertake this work efficiently and to achieve the required quality and programme.
- **Algal water quality testing and analysis, CEH** – CEH were assessed as uniquely positioned in the market to provide Algal sampling services and it was possible going through Thames Water to procure these services with CEH across multiple SROs providing efficiencies in management, consistency of approach and reporting.
- **Contract extensions.** Given the complexity of STT contract extensions have been relatively limited. However, various contract extensions were made directly to suppliers most notably the engineering and environmental workstreams where extensions to the scope provided continuity of activities and/or maintained programme at critical stages. Examples included critical seasonal environmental investigations arising from regulator comments, extending benefits studies or undertaking 'potential futures' as part of the interconnector options appraisal and were typically less the 10-15% of the contract values.

Other contracts were also extended from Gate 1 using an extension of the competitively tendered framework rates to allow the continuation of the technical expertise and continuity with stakeholders.

Other areas of workstream efficiency

Water quality sampling and testing

- 3.29 The largest single package of work procured competitively was for water quality sampling and testing.
- 3.30 Working with regulators, sampling locations and testing requirements were established covering the Rivers Vyrnwy, Avon and Severn as well as the Gloucester and Sharpness Canal. For the River Thames, work has been co-ordinated with SESRO investigations to avoid duplication of effort.
- 3.31 This package exceeded £500k for Gate 1 over a period of sampling and testing from December 2021 to June 2022. The sampling and testing then continued from July 2021 to October 2022 to provide the necessary data for assessment purposes at Gate 2 and beyond into Gate 3.
- 3.32 For reporting purposes annex A breaks the Gate 2 water quality sampling and testing activity into two items:
- July 2021 to April 2022 for the data used directly for Gate 2 assessment and;
 - ongoing sampling and testing post-April 2022 which is required to provide continuity of a data required for Gate 3.

The cumulative cost of these activities approaches £1million in expenditure for Gate 2.

- 3.33 This package was competitively procured through Thames Water's FA1300 framework in a combined procurement with four other Thames Water SROs (SESRO, T2AT, T2ST, London Re-use) providing an attractive package to the supply chain and allowing economies of scale. The laboratory test rates are a significant cost for this package and were separately benchmarked with Severn Trent procured works for Minworth SRO at Gate 1.
- 3.34 Water quality and sampling testing requirements were regularly reviewed and amended to reflect to the requirements of the project, including incorporating regulator's review and feedback, and to ensure consistency of approach across SROs.
- 3.35 Following collection of 12 months data required for Gate 2 assessment, the project team, with regulator agreement, reviewed and reduced sampling locations from April 2022 onwards to reflect scheme options appraisal findings and requirements feeding into Gate 3. This reduction was however largely offset by increased costs associated with revised testing suite for olfactory inhibitor parameters and emerging substances, as well as extended algae sampling.
- 3.36 Table 3.4 provides a summary of sampling scope for Gate 1 and Gate 2, including the principal adjustments made in Gate 2

Table 3-4 Summary of WQ sampling and testing

Testing and Sampling Period	Summary of sampling and testing
Gate 1	
December 2020 to June 2021	<ul style="list-style-type: none"> • 15 WQ spot sampling sites • 16 continuous monitoring sondes
Gate 2	
July 2021 to March 2022	<ul style="list-style-type: none"> • 19 WQ spot sampling sites (additional 4 added from Gate 1) with additional 'PFAS 20' testing at selected sites • 16 continuous monitoring sondes
April 2022 – September 2022	<ul style="list-style-type: none"> • 11 WQ spot sampling sites (8 sites removed). Olfactory suite added and EQSD added to selected sites; and from June 2022 'PFAS 51' added to selected sites. • 13 continuous monitoring sondes (3 removed).
October 2022 into Gate 3	<ul style="list-style-type: none"> • 10 spot WQ sampling sites (1 site removed). Olfactory suite added to and emerging substances suite added selected sites • 11 continuous monitoring sondes (2 sondes removed)
<ul style="list-style-type: none"> • Monthly spot sample and testing varied depending on site and requirements including Water Framework Directive (WFD), Environmental Quality Standards Directive (EQSD), Drinking Water Safety Plan (DWSP), PFAS 20, PFAS 51 (per- and polyfluoroalkyl substances), olfactory and emerging substances suites. • Continuous monitor sondes: temperature, conductivity, dissolved oxygen, pH, turbidity and ammonia 	

Interconnector options appraisal and design development

- 3.37 A decision was taken at the start of the Gate 2 programme to undertake the Interconnector Options Appraisal early in the first half of Gate 2.
- 3.38 A comprehensive multi-disciplinary, desk-top options appraisal assessment was undertaken including assessment of benefits and 'potential futures' associated with the construction of the Cotswold Canals. This further detailed in the Gate 2 report and annexes.
- 3.39 Following the selection of a Gate 2 preferred option, it was the possible to develop and refine the design for the preferred option including:
- Development of conceptual design treatment processes based on updated water quality data and refinement of sweetening flow requirements
 - Potential routing corridors and siting
 - Sizing of intake structures and break pressure tank
 - Sizing of rising main and gravity pipeline sections
 - Interfaces with SESRO
 - Geological desk-top review
 - High-level hydraulic and surge analysis
 - Updated costings, risk allowance and carbon assessments
- 3.40 As well as meeting Gate 2 objectives, this approach allowed design development, investigations, and environmental assessment for the Gate 2 report to proceed against a single preferred option type. Whilst not the primary driver for the appraisal, the approach reduced costs and improved Gate 2 efficiencies across workstreams including in environmental and water quality monitoring, environmental assessment, and engineering design development activities.
- 3.41 Whilst enabling the characterisation and development of a single preferred option for Gate 2, this work will be developed further for Gate 3 including field work and engagement and consultation with stakeholders on both preferred and alternative options.

Gate 2 technical activities supporting Gate 3

- 3.42 There are a number of technical related activities that were undertaken through to the end of the Gate 2 submission which are required to inform and facilitate Gate 3 activities. A summary of these activities is presented below:

Table 3-5 Summary of technical activities supporting Gate 3

Water quality sampling and testing, including Algal testing.	There was a cut-off in the first half of 2022 where data that can be used for Gate 2 assessments and reporting purposes. Continuation of water quality monitoring beyond that provided a contiguous data set across seasons and multiple years for use in future phases/gates. This included various sampling suites including olfaction related testing. Activities were agreed with the environmental regulators and DWI.
Seasonal environmental and ecological surveys.	Beyond any Spring 2022 data available for Gate 2 assessment and reporting, there will be a continuation of targeted monitoring and surveys to provide necessary data to inform the Gate 3 / EIA process. This is planned to avoid significant data gaps arising that could affect progress and may include both aquatic and terrestrial surveys. Activities may include investigation into depressed and pearl mussel (fish encyst) sustainable population in the river Vyrnwy, further seasonal fish surveys and further flow and habitat investigations. These will be agreed with the environmental regulators.
Stakeholder engagement and responding to stakeholder queries	Ongoing stakeholder engagement including briefing stakeholders ahead of Gate 2 report publication. Includes briefings to potentially affected stakeholders (e.g., local authorities and special interest groups) ahead of gate 2 and engagement with stakeholders affected by the selection of a preferred interconnector option. Responding to any STT related stakeholder queries received directly or through RAPID, regional and company WRMP teams.
Support to WRMP and regional planning	Providing information to and reviewing information from companies relating specifically to the STT SRO, and preparation of data for the WRSE February 2023 update

Thames Water Gate 2 procurement and management activities supporting Gate 3 interconnector delivery

- 3.43 For Gate 3, it is proposed that Thames Water will be accountable for the development and delivery of the Interconnector. Thames Water has established an internal Client team to manage its portfolio of SRO projects. During Gate 2, that team has been engaged in the development, review and assurance of the Gate 2 submissions, the development of plans for Gate 3, procurement of ongoing consultancy support and stakeholder engagement, across the Thames Water SRO portfolio.
- 3.44 For Gate 2, the total cost of the Thames Water Client team's work related to STT is approximately £300k (2017/18 base) and is allocated to relevant activities presented in appendix A. Severn Trent and United Utilities, as providers of water, are not exposed to the same delivery risk as Thames Water and their costs are less as a result.

3.45 Separately, Thames Water has written to RAPID, with the support from Severn Trent and United Utilities proposing that some Gate 3 activities commenced in August 2022. RAPID has advised¹ that such costs should be accounted for as Gate 3 expenditure and these are not included in the reporting of Gate 2 expenditure.

Benchmarking

3.46 As well as the competitive procurement of the majority of work packages, a benchmarking comparison was undertaken across SRO's for consistency in costs incurred for each work breakdown structure element. This indicated generally good alignment across SRO's when the differing nature of the schemes is factored in.

4 Forecast Gate 3 and Gate 4 expenditure

- 4.1 Table 4-1 provides a summary of the current Price Review 2019 (PR19) final determination funding for the STT SRO. This is on the basis that the underspend from Gate 1 and Gate 2 can be carried forward into Gate 3 and Gate 4.
- 4.2 Table 4-2 summarises the estimated funding requirements for the STT SRO at Gate 3 and Gate 4. This indicates that the current PR19 funding of £66.6m is sufficient to cover STT activities to the end of AMP7.
- 4.3 If the STT SRO progresses beyond the Gate 3, the funding for Gate 4 activities, to be undertaken in AMP 8, would be agreed with RAPID and reflected in PR24.

Table 4-1 STT PR19 funding allowance

Gate	STT SRO PR19 Funding	Cumulative funding	Cumulative funding less Gate 1 and 2 forecast expenditure**
Gate 1	£6,660	£6,660	-
Gate 2	£9,990	£16,650	£5,450
Gate 3	£23,310	£39,960	£28,760
Gate 4	£26,640	£66,600	£55,400

** Gate 1 and Gate 2 outturn spend is estimated at £11,200
All values are reported in £,000 and 2017/18 price base.

Table 4-2 Estimated Gate 3 and Gate 4 funding requirements

Gate	Estimated Funding requirements			Cumulative Estimated Funding requirements	Cumulative funding	Estimated cumulative funding shortfall
	Interconnector Development	Bypass, System Coordination	Total			
Gate 1 & 2	£11,200	-	£11,200	£11,200	£16,650	
Gate 3	£38,100	£11,400	£49,500	£60,700	£39,960	£20,740
Gate 4	£25,200	£7,550	£32,750	£93,450	£66,600	£26,850
Total	£63,300	£18,950	£93,450	-	-	-

All values are £,000 and 2017/18 price base

¹ Email from RAPID to Thames Water, 'Thames Water SRO advanced Gate 3 spend proposal', 2nd September 2022 in response to Thames Water letter 'Early Gate 3 Expenditure', 18th August 2022.

4.4 Table 4.3 provides a breakdown of Gate 3 and Gate 4 in accordance with the RAPID template.

Table 4-3 Percentage breakdown of estimated Gate 3 and Gate 4 expenditure by RAPID WBS

Work breakdown structure (WBS)	Gate 3	Gate 4
Programme & project management	17%	19%
Feasibility assessment and concept design	16%	21%
Option benefits development and appraisal	11%	2%
Environmental assessment	8%	15%
Data collection, sampling, and pilot trials	7%	2%
Procurement strategy	11%	14%
Planning strategy	17%	12%
Stakeholder engagement	7%	8%
Legal	6%	7%

4.5 The principal reasons for the potential for further funding in AMP 8, for Gate 4, arise from the following:

- The Vyrnwy Bypass Pipeline only emerged as a firm requirement as part of the Gate 1 and 2 work. At PR19 the Vyrnwy Bypass Pipeline costs were only included within risk provisions that did not form part of the SRO funding.
- PR19 assumed a 300 ML/d capacity interconnector (intake, pump stations, treatment works and pipelines) whereas the interconnector elements are now to be designed for a 500ML/d capacity.
- The funding for STT at PR19 was based only on the CAPEX value for the Interconnector and excluding costed risk and optimism bias.
- The PR19 funding was based on the assumption that SROs development to Gate 4 would be undertaken within AMP7 (March 2025). Development of the programme as part of the Gate 2 work indicates completion within AMP7 is not realistic following consideration of the requirements for the DCO and DPC processes. The earliest completion date for Gate 4 would be by the end of 2026.

4.6 The RAPID PR19 approach applied a 6.4% factor to the SRO cost as a means to estimate development costs to Gate 4. Applying this approach to the current estimates, and incorporating the SRO changes above, provides an estimate² for the development of the SRO to Gate 4 which is comparable to the estimates in Table 4-2 through to Gate 4 completion.

5 Gate 3 funding

5.1 As set out in the Chapter 7 of the main report and the project delivery plan annex, for Gate 3 the proposed accountabilities of the STT partners will change with:

- All three partners responsible for the System Co-ordination
- All three partners responsible for the Bypass development
- Thames Water responsible for the interconnector development

² Total Gate 2 CAPEX estimate for the 500ML/d Interconnector and 180ML/d Bypass is circa £1,450m; 6.4% of £1,450m = £92.8m at 2022 base or ££84m at 2017/18 base.

This will attract a commensurate change in partner liabilities, including any penalties as may be determined by RAPID.

- 5.2 It is proposed that the Gate 3 funding split between companies to the end of AMP7 is changed to match the allocation of accountabilities, with a funding allocation of approximately 80% to Thames Water and 10% each to Severn Trent and United Utilities.

6 Conclusion

Efficiency of Gate 2 expenditure

- 6.1 The STT scheme has been efficiently delivered within the budget for Gate 2, with an underspend of circa 30%.
- 6.2 The SRO complexity and multi-partner involvement has demanded a clear structure, defined processes and joint ways of working. This has avoided duplication of effort or a siloed approach and utilised the strengths of the team members to ensure efficient use of core team activities and overall program management.
- 6.3 The workstream expenditures are solely in respect of specific STT SRO activities. Costs for other SRO activities and other company activities, including regional and WRMP24 planning, are not included in expenditure for STT Gate 2 activities.
- 6.4 Excluding internal in-company, regulator charges and other similar items that are not appropriate to procure, activities have been procured under company frameworks with circa 85% of activities (by value) subject to scope specific procurement competitions across company framework suppliers.
- 6.5 The assurance of the Gate 2 expenditure included an audit by an independent, third-line assurer, which concluded that the expenditure for Gate 1 was efficient and relevant to the development of the submission.

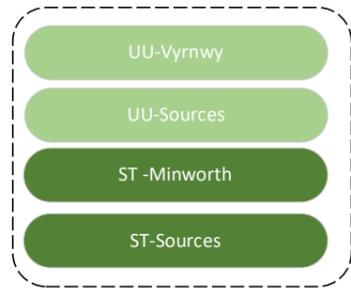
Gate 3 and Gate 4 expenditure and funding

- 6.6 The current PR19 funding of £66.6m is sufficient to cover STT activities to the end of AMP7. If the STT SRO progresses beyond the Gate 3, the funding for Gate 4 activities, to be undertaken in AMP 8, would be agreed with RAPID and reflected in PR24.
- 6.7 It is proposed that the Gate 3 funding split between companies to the end of AMP7 is changed to match the allocation of accountabilities, with a funding allocation of approximately 80% to Thames Water and 10% each to Severn Trent and United Utilities.

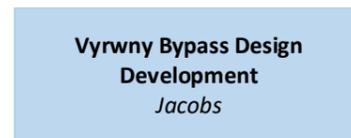
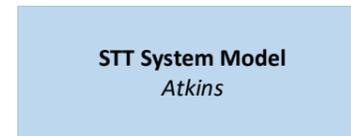
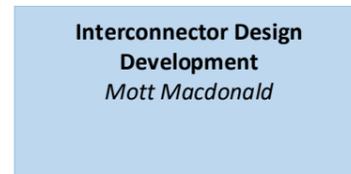
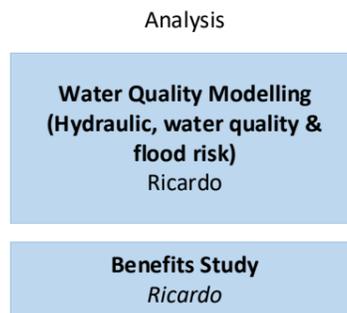
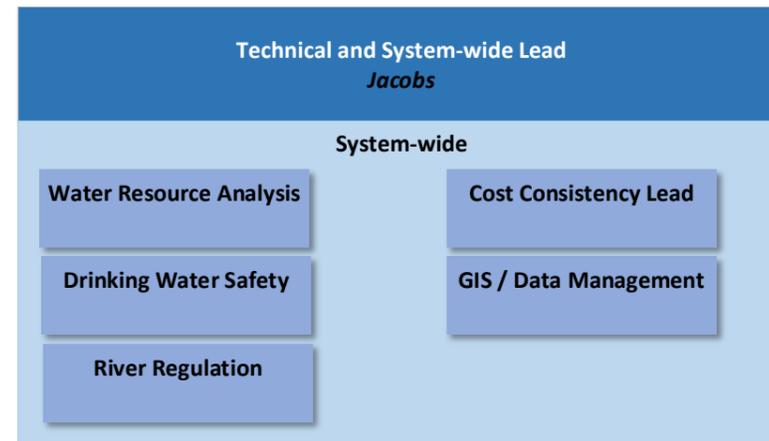
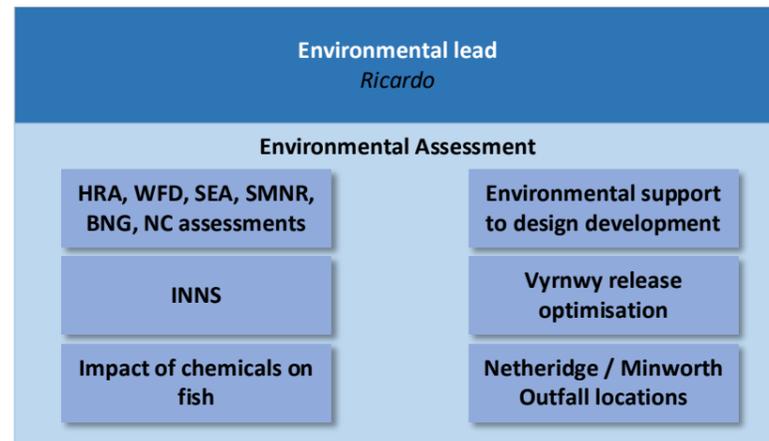
Appendix A. Breakdown of Gate 2 expenditure

Category	Activity	Expenditure 2017/18 price base	% of total expenditure	Description of activity
Programme & project management	Total	£929,924	12.9%	
	Programme management	£385,042	5.3%	Full-time programme manager and plus part-time support
	Governance (tripartite company cost)	£473,938	6.6%	Company PMB governance and management activities. This is split three ways between United Utilities Severn Trent and Thames Water.
	Assurance	£70,944	1.0%	Independent third line assurance & part-time assurance coordinator
Feasibility assessment and concept design	Total	£918,801	12.8%	
	Systemwide design and technical lea	£474,927	6.6%	Systemwide engineering including regional/WRMP24 STT data submissions & updates; operational strategy; permitting strategy; overall SRO cost management and reporting; Gate 2 report delivery; overall technical co-ordination.
	Interconnector design development	£166,606	2.3%	Design development and costings of preferred Interconnector option
	Bypass + Shrewsbury design development	£277,268	3.8%	Design development & costings of preferred Bypass & Shrewsbury supply options
Option benefits development and appraisal	Total	£1,000,110	13.9%	
	<i>STT water resources system model</i>	£305,213	4.2%	Development of a linked Pywr STT system model and initial runs for Gate 2
	<i>Severn losses</i>	£116,804	1.6%	Additional River Severn losses investigations including ungauged tributaries, correlation analysis and antecedent conditions.
	<i>DO and utilisation analysis and modelling</i>	£61,573	0.9%	Detailed review of DO & stochastics for STT
	<i>Interconnector options appraisal</i>	£429,277	6.0%	Detailed appraisal of interconnector route and site options, including 'potential futures' and stakeholder technical engagement
	<i>Bypass design + Shrewsbury options appraisals</i>	£87,243	1.2%	Detailed route and supply options appraisal of Bypass and Shrewsbury
Environmental assessment	Total	£1,949,443	27.1%	
	Environmental Advisor	£64,600	0.9%	Independent oversight and review of all environmental deliverables
	<i>Environmental Assessments:</i>			
	<i>BNG, NC, HRA, WFD, SEA, SMNR</i>	£356,297	4.9%	Environmental methodologies, evidence reports & assessments
	<i>Engineering scheme inputs</i>	£113,667	1.6%	Environmental inputs into Interconnector, bypass, and Shrewsbury
	<i>Other</i>	£175,070	2.4%	Vyrnwy direct release, outfall locations & chemical determinants of fish
	<i>Environmental Lead</i>	£151,950	2.1%	Cross system co-ordination including interfaces with regulators & SROs
	<i>Wider benefits study</i>	£76,100	1.1%	Investigation into wider opportunities based on 6-capitals approach
	<i>Water quality modelling</i>	£342,669	4.8%	River Vyrnwy, Avon, and Severn water quality model development and runs
	Regulators and Regional charges:			
	<i>Natural Resources West (NRW)</i>	£83,799	1.2%	Regulator charges are subject to variation based on final out-turn
	<i>Natural England</i>	£90,096	1.3%	Regulator charges are subject to variation based on final out-turn
	<i>EA Including NAU</i>	£466,129	6.5%	Regulator charges are subject to variation based on final out-turn
	<i>WRSE, WRW regional charges</i>	£29,063	0.4%	Regional charges for specific STT-related activities undertake on behalf of the SRO for efficiency and consistency purposes by the region.
Data collection, sampling, and pilot trials	Total	£1,613,970	22.4%	
	<i>Aquatic ecological monitoring</i>	£245,099	3.4%	Includes fish, macrophytes, macroinvertebrate, INNS, diatoms for rivers
	<i>Protected species (summer 2021 surveys)</i>	£109,854	1.5%	Plant, protected species, and protected habitat surveys on the rivers
	<i>Physical/water quality monitoring for Gate 2 reporting</i>	£497,460	6.9%	Sondes, water quality sampling and testing for over 20 sites until April 2022
	<i>Continued monitoring (spring/summer surveys 2022)</i>	£40,944	0.6%	Fisheries, mussels, weir pool habitats,
	<i>Physical/water quality monitoring</i>	£485,126	6.7%	Continuation post-April 2022, sondes, water quality sampling and testing
	<i>Algae and PFAS monitoring</i>	£235,486	3.3%	Algal and PFAS sampling and testing including flow cytometry
Procurement strategy	Total	£380,036	5.3%	Developing commercial operating model and procurement approach
Planning strategy	Total	£115,666	1.6%	Developing planning consents strategy, including land
Stakeholder engagement	Total	£140,962	2.0%	Three customer research activities & stakeholder management
Legal	Total	£156,829	2.2%	Detailed legal reviews of Interconnector options, planning strategy & Gate 2 documentation including three company legal team inputs.
Other	Total	£0	0%	
Total		£7,205,743	100.0%	
Funding allowance:				
	Gate 2 Allowance (G2 underspend)	£9,990,000 (£2,784k)	72%	
	Gates 1 & 2 total spend: Gates 1 & 2 allowance (G1&G2 underspend)	£11,219k £16,650k (£5,430k)	67%	

Appendix B. Gate 2 high level organisation chart



UU & STW sources SROs feed into system modelling and system appraisal and alternative review



Appendix C. Programme governance and direction activities

Activity	Principal tasks	Estimated level of effort % split
Standing meetings /calls	<ul style="list-style-type: none"> Weekly co-ordination meeting (chaired by PM with three company representation) Programme Management Board – monthly formal progress review and governance Programme Steering Group - attendance with senior board members (typically every 6 months) Review and sign-off of STT quarterly RAPID report and company representation at RAPID QLM Attendance and inputs into weekly ACWG** Weekly / fortnightly 1-2-1 catchups with STT PM STT checkpoint meetings with RAPID 	10%
Commercial and programme oversight	<ul style="list-style-type: none"> Reviewing and approving proposals and procurements for Gate 2 expenditure. STT budgetary review, challenge and approval Developing principles for commercial arrangements for Gate 3 and beyond. Company expenditure collection and reconciliation 	20%
Technical oversight and assurance.	<ul style="list-style-type: none"> Technical working group – monthly review of technical issues with selected PMB attendance Numerous specific technical, water resources, commercial, planning consents, permitting, stakeholder, assurance and other workstream meetings where either an appreciation or direct input into the technical direction of scheme is required. WRSE template completion (Oct21, Feb 22 updates) – significant input from companies as this covered the STT system. Particular focus with UU and STW PMB members on provision of prices**. Review, governance and sign-off required by all. Inputs from STW representing PMB in overseeing and directing assurance activities. Reviews of interim and final processes, reports, technical, commercial and procurement documentation. Supporting interfaces with source and downstream SROs** Reviews of technical supporting reports and Gate 2 report including participation in 3-stage check-point process (offline review and workshops x 3) Taking Gate 2 report and appendices through company boards and governance streams Sharing and taking best practice across SROs** 	30%
Stakeholder	<ul style="list-style-type: none"> PMB support and representation with different forums and stakeholders. Review and strategic direction on approach to engagement. 	10%
Cross company / SRO support	<ul style="list-style-type: none"> SRO representation at ACWG, RAPID** Leadership and participation in RAPID 'task and finish' groups** Ad hoc STT presentations, meetings and call to Ofwat, RAPID and others 	10%
In-Company governance activities	<ul style="list-style-type: none"> Internal company SRO presentations and reporting (varies typically monthly) ** Committee, exec and board level governance of STT deliverables – papers, pre-briefings, presentations and actions arising – for mobilisation, regional and gate submissions, Managing queries and maintaining buy-in of other company functions (e.g. legal, regulatory, procurement, senior management) to STT activities and strategies and future approaches. Source in-house staff and subject matter specialist support where required (e.g. for cross company working and steering groups and reviews) 	20%
** denotes tasks where companies are sometimes representing multiple SROs that a company is participating with, but activity includes a component attributable to STT.		

Appendix D. Programme management activities

Activity	Principal tasks	Estimated level of effort % split
Programme Management and programme support activities	<ul style="list-style-type: none"> Producing, maintaining and monitoring Scope, Work Breakdown Structure, programme (timeline), procurement tracker, forecast, change and risk register. Reporting and meeting processes Running Gate 2 cost reconciliation process between companies with monthly reviews and Gate 2 close out. Engage with NAU, EA, NRW, NE and others regarding external charges to the project prepare, chairing and minuting – weekly call, Programme Management Board (PMB), Programme Steering Group (PSG), RAPID quarterly report preparation (plus attendance at selected QLM meetings / items checkpoint meetings with RAPID – preparation, presentations and notes team management, workstream and overall programme delivery. weekly meeting with environmental and engineering leads and regular progress and commercial reviews for other workstreams 	30%
Work package procurement activities	<ul style="list-style-type: none"> Managing procurement process Weekly procurement meeting with three company procurement leads. answering tender queries and contract award meetings contract progress reviews, risk management meetings and compensation event management 	15%
Technical (Engineering, Water Resources, Environmental, System. Consents and permitting)	<ul style="list-style-type: none"> working closely with technical leads to understand and support their technical workstream delivery, review technical issues and agree approaches and technical decisions/direction. Working with and supporting planning consents strategy and implementation, permitting and review of outputs. Setting up company subject matter specialist working groups and attending technical working group calls. Writing and review of technical scopes of work for procurement of all workstream activities. Including preparing scopes of work for Gate 2, 'Gate2 for Gate 3' activities and Gate 3 critical procurement activities (briefs and tender documents) ahead of the start of Gate 3. Writing selected Gate 2 report chapters and associated supporting documents and appendices. Review and assurance of Gate 2 technical deliverables. Chair and attending technical meetings and dealing with technical issues and interfaces Regional planning (WRSE/WRW) interface and co-ordination Supporting co-ordination across SRO's to ensure consistency of approaches and efficiencies 	30%
Commercial model / planning for Gate 3	<ul style="list-style-type: none"> Supporting procurement of and managing commercial advisor activities. Close working with all three companies individually and jointly to agree commercial model strategy and approach for Gate 3. 	10%
Other activities	<ul style="list-style-type: none"> Stakeholder engagement and presentations - GARD, CCT, Welsh Government, NAU (EA, NRW, NE), DWI, RSWG, RAPID, Ofwat, WRSE webinars, local authorities , etc Managing assurance process (first, second and third line and legal) and attending regular meetings with company assurance leads Supporting Legal agreements and reviews Share best practice across SROs including regular PM meetings and feeding learnings into STT. CDM principal designer duties. 	15%