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Strategic regional water resource solutions: standard gate two final decision for River Severn to River Thames Transfer

Ofwat

Contents

1. Introduction

The purpose of this publication is to set out our final decision about whether the River Severn to River Thames Transfer (STT)[1] solution should continue to receive development funding[2]. The solution owners Thames Water, Severn Trent Water and United Utilities submitted their standard gate two reports on 14 November 2022 for assessment. Further information concerning the background and context of the Thames Water, Severn Trent Water and United Utilities STT can be found in the STT publication document on the Thames Water website[3].

This publication should be read in conjunction with the final decision letter issued to each solution owner. Both this document and the final decision letters have been published on our website.

The assessment process is overseen by RAPID, with input from the partner regulators Ofwat, the Environment Agency and the Drinking Water Inspectorate. The Environment Agency together with Natural England and Natural Resources Wales (for solutions involving Wales), have reviewed the environmental sections of the submissions, and provided feedback to RAPID. The Consumer Council for Water provided input to the assessment on customer engagement.

The solution owners and other interested parties had the opportunity to respond to the draft decision during the representation period, which followed the publication of the decisions on 30 March 2023. We have taken all relevant representations into account in making our final decision.

We would like to thank Thames Water, Severn Trent Water and United Utilities for the level of engagement, collaboration and innovation that they have exhibited during this stage in the gated process.

[1] Referred to in PR19 final determination as “River Severn to River Thames transfer”
[2] PR19 final determinations: Strategic regional water resource solutions appendix
[3] https://www.thameswater.co.uk/about-us/regulation/strategic-water-resource-solutions

2. Solution Summary

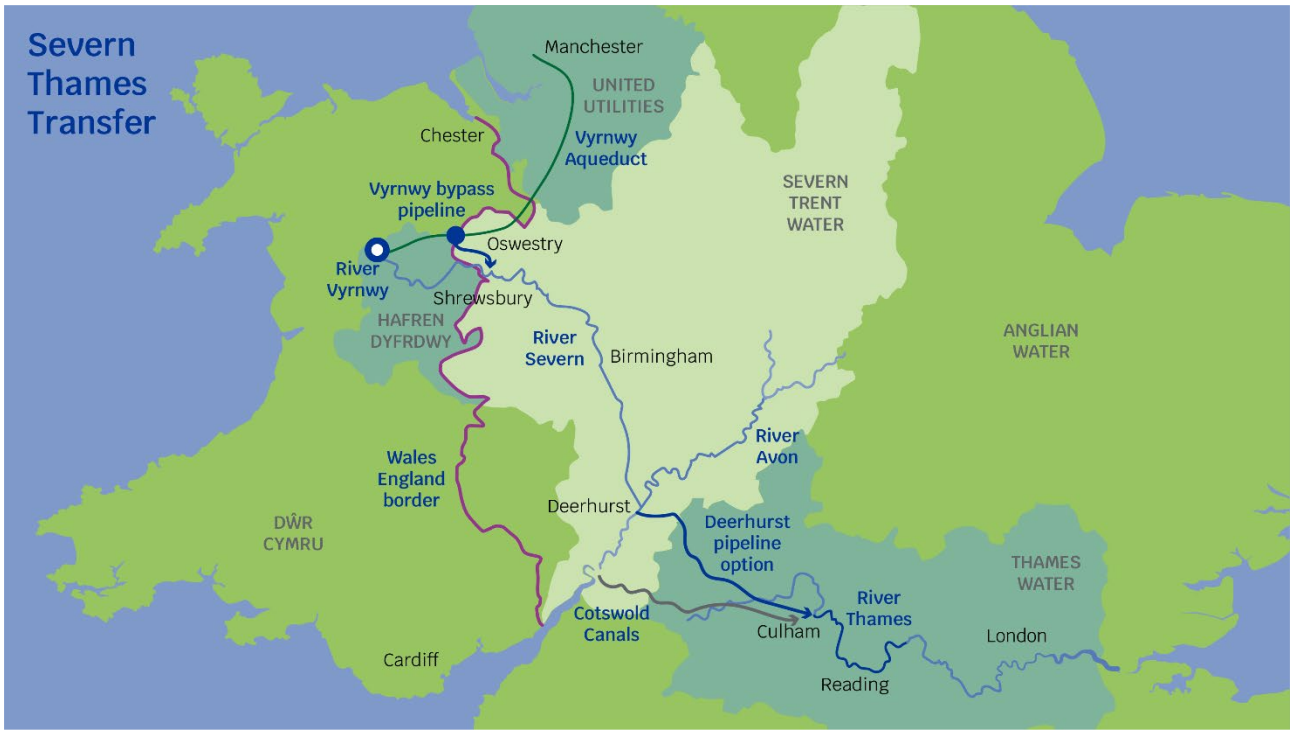
2.1 Solution summary

The River Severn to River Thames Transfer (STT) enables a transfer of water from the River Severn to the River Thames. The solution forms part of the wider STT system composed of STT, Severn Trent Sources (STS) and North West Transfer (NWT). STT is composed of:

- **Interconnector:** the treatment and transfer of flows from the River Severn to the River Thames.
- **River Vyrnwy bypass pipeline:** connects flows from Lake Vyrnwy at Oswestry to the River Severn, thus mitigating any environmental impacts in the River Vyrnwy.

Due to the risk of concurrent droughts in both the River Severn and River Thames, additional sources of water have been identified to augment the natural flows and ensure that a transfer can be maintained. These sources and their conveyance through the rivers are addressed in the NWT and STS gate two submissions.

Figure 1. River Severn to River Thames Transfer Solution Schematic



3. Summary of representations

3.1 Representations received

We have received the following representations relevant to the River Severn to River Thames Transfer.

Table 1. Summary of representations

Representation from	Summary of representation
Members of the public	**Loss of amenity** • Members of the public are concerned that low and unstable water levels, specifically during summer, will impact the recreational value of the River Severn. The section of river below Deerhurst where the water will be extracted from, and above where waste water will be added to supplement the River Severn's water level, is of particular concern because there are at least two recreation clubs that use this section of river every week. • Members of the public are concerned that water quality will be lower which will affect the health of recreational users of the river. • They are concerned about the loss of amenity value of the River Severn due to factors like an increase in silt and foul smell from treated effluent in the river, in addition to any attempt to site the proposed works in this position. • Members of the public also have concerns that the recreational use and amenity value of the River Severn has not been sufficiently taken into account during the assessment of costs and benefits, including the accessibility of sailing and water sports for general public and sailing club members. • Water turbulence caused by the inflows and outflows of the proposed projects will make sailing in this part of the river extremely dangerous and therefore any proposals to proceed must include the very substantial costs of relocating the sailing club. • The proposed works are likely to create a hazard to small boats, both during construction and in operation. • Members of the public expressed concern that there would be significant environmental damage, included felled trees, caused by infrastructure including the pipeline and pumping stations.

	• They are concerned that there will be disruption to the countryside, especially during construction. For example, traffic disruption where pipelines cross roads. **Environment** • Members of the public raised concerns around the impact on water levels and water quality in the River Severn particularly during summer. • There was concern expressed for potential damage to migratory fish (salmon and elvers) and it was highlighted that the River Severn is the longest salmon river in England and that polluted water will be added above the tidal flow point at Tewkesbury and the water level reduced overall, will affect the salmon in the river. • Members of the public highlighted that the River Severn is a home for a variety of creatures and many species of birds including ducks, swans, snipes and moorhen. • They asserted that there was not enough focus on the environment in the gated assessment. There are concerns that the consultation has only three paragraphs that are concerning the environment. It was felt that this is inadequate and seems to show that the regards of finance and people's water supplies overrides the damage that could be caused to the environment and habitats, downstream from Deerhurst. • Potential negative local environmental impact of increased periods of low water levels which would extend further down the River Severn. • There was concern about the impact on ecology and habitats from joining two distinct water ways (River Severn and River Thames) together due to differing local conditions. The ecology of these rivers depends upon an established pattern of seasonal river levels, and acceptable water quality. Changes are likely to be detrimental to some species and to reduce biodiversity. • It was expressed that there is potential for lower water quality due to more treated effluent being discharged further up stream and that this could harm the ecology, including the salmon and other fish, and all the recreational facilities that use the river. Note considerable work has been done and is being proposed to recover the Severn for migratory fish and particularly the endangered eel. Further denuding the water resource and increasing the pollution burden runs contrary to the long term plans for a healthier, more natural river. • Lower water levels could also result in higher concentration of pollution, which is already a significant concern

	(particularly agricultural runoff leading to algal bloom and existing sewage outlets are discharging poorly treated foul water). • Members of the public expressed distrust of water companies releasing treated effluent into rivers given numerous reports about the quality of the rivers in the UK which are heavily polluted by bad practises by the water companies. They note there seems to be inadequate regulation and laws to stop this pollution occurring. **Carbon cost** • The energy cost (carbon cost) of construction will be very high, and into the future that of ongoing pumping, especially to cross the Severn-Thames watershed. **Fixing leaks** • Members of the public comment that Thames Water and Severn Trent Water should focus on fixing existing infrastructure rather than building STT. • It was noted that there should be more done to educate water customers to reduce consumption. **Stakeholder engagement** • Members of the public stated that there has been insufficient stakeholder engagement around the solution, particularly how the interests of recreational users of the river for water sports have been addressed and what measures have been put in place to alleviate concerns about the adverse impact on water levels and quality. • Note residents of Deerhurst Parish expressed disappointment that they had not been formally advised of these proposals. **Solution progression** • Many of the members of public objected to the proposal for the Severn to Thames Transfer. **Water resource planning** • Members of the public expressed that other less risky options should be considered. It was suggested that a national desalination program be considered instead to safeguard long term UK water supply.
Wantage and Grove Campaign Group (WaGCG)	**Solution costs** • WaGCG are concerned about the financial burden of RAPID solutions on future generations. They strongly support the call by Group Against Reservoir Development (GARD) that Regulatory Capital Value should be included in the intergenerational equity metric. They also assert that the impact on customer bills should be required in the submissions and gated assessment. **Interconnectedness** • WaGCG suggest that the gated process should consider the connected solutions together.

	• They assert that the carbon footprint, financial cost, return on value, cost to the consumer, recreation and amenity value, and environmental impact of any integrated solution is impossible to define from the fragmentation of the strategies. • They find that the current process does not allow for comparison of different options. **Water resource planning** • WaGCG are concerned that the data used for population and climate change forecasts is inappropriate and that this has resulted in an inaccurate needs case for the solutions. • WaGCG support the assertion by GARD that STT would not be required if Thames Water reduce leakage and achieve the government target for household water usage. However, they note that uncertainty over the amount and timing of the leakage and per capita consumption (PCC) reductions, means it could be prudent to provide extra supply capacity to the London and the Thames Valley as early as possible. They note that STT has the maximum strategic, environmental and drought resilience impact. • WaGCG support the GARD proposal that the STT transfer aqueduct should be built as quickly as possible, initially with only a modest amount of support sources, but with the capability of adding new sources if needed. • They believe that STT should be prioritised over South East Strategic Reservoir Option (SESRO) because it is a more adaptable solution to respond to demand. **Solution progression** • Support that in the Draft Decision Document relating to the STT it states that 'the evidence suggests that the solution is a potentially valuable way of supplying water to customers'. • Agree with gate two priority action 6 and actions 1-6.
East Hendred Parish Council	**Solution progression** • Agree with gate two priority action 6 and actions 1-6.
Steventon Parish Council (SPC)	**Water resource planning** • SPC suggest that the population forecast used to calculate water demand have overestimated population growth. • Acknowledge climate change is a key factor for future water needs but need to consider the full picture of climate change effects and predictions, not selective ones. **Funding** • SPC are concerned that the disparity in funding and timing for STT and SESRO is unfair and that it demonstrates a preference for SESRO. **Solution progression** • Suggest that the Severn to Thames Transfer will not be pursued should construction of SESRO go ahead despite the benefits.

	• Concerned that if detailed information on STT is not available by checkpoint, the solution will be put on the backburner. • Steventon Parish Council are concerned that the decision to develop solutions will be a political one rather than based on robust technical information.
CPRE Oxfordshire	**Interconnectedness** • CPRE do not agree that the gated process assesses solutions individually and suggests the connected solutions should be reviewed and evaluated together (including the various sources of water in the River Severn). They find that the current process does not allow for the different options to be compared and sequenced appropriately. **Water resource planning** • They believe that any of the projects are only justified on the basis of outdated (and inflated) population forecasts, a flawed adjustment for climate change and over-estimates of the abstraction reductions required from chalk streams. They find that the climate change scenario is unrealistic. • Suggest that it should be recognised that there is a strategic need to transfer water from the relatively wetter and less populated north and west of the country to the dry and heavily populated South East. • Reference National Infrastructure Commission 2018 report that water transfers should be prioritised. **Solution progression** • CPRE Oxfordshire supports GARD's proposal that STT should be built as soon as possible with limited number of support sources that can be expanded if needed. • Highlight the scalability and adaptability of STT and state there will be minimal long term environmental damage compared to other solutions.
South Oxfordshire District Council and Vale of White Horse District Council	**Gate timing** • South Oxfordshire District Council and Vale of White Horse District Council assert that there is a lack of clarity around the timing of the remaining gates and question the reasoning behind the staggering of gates across the solutions. • South Oxfordshire District Council and Vale of White Horse District Council would like clarity around why there are decision points for some schemes and not others. **Solution progression** • Overall South Oxfordshire District Council and Vale of White Horse District Council are supportive of STT progressing to the next gate. • Understood that schemes would drop out at gate two.

	Water resource planning • Concerned about strategic reservoirs being the preferred option and the environmental damage and carbon emissions associated with them. **Funding** • They believe that the disparity in funding for different solutions gives unfair advantage. **Stakeholder engagement** • They think that RAPID should encourage solution owners to engage with local planning authorities.
Councillor for Drayton Ward and Vale of White Horse District Council	**Interconnectedness** • The councillor believes that RAPID should treat solutions as interconnected in terms of their costs, benefits, issues, and challenges. **Water resources planning** • They think that the population forecast uses out of date data (Office of National Statistics 16 rather than Office of National Statistics 20) • They believe that excessive abstraction reduction targets. • The councillor questions why water transfers from wet parts of country to dry parts of the country are scheduled after SESRO. In addition, they question why large and less flexible projects like reservoirs are scheduled ahead of STT which is scalable and flexible with less environmental challenges.
Severn Trent, Thames Water and United Utilities (the water companies)	**Wider Environment Agency support** • The solution owners highlight the potential for misinterpretation of EA's support for the solution given feedback in water resource management plans (WRMPs). • The solution owners request that RAPID's balanced view regarding STT's viability, as expressed within the draft decision, is retained and reinforced within the final decision. **Environment** • The solution owners request that the priority actions 2 and 3 recognise that whilst progress should be made by December 2023 based on the results of bench tests, there will be further work required in gate three to fully address the environmental uncertainties identified. **Gate timing** • The solution owners request within the final decision that there is RAPID confirmation around the timing of gate three, noting the dates are 'earliest target dates' and that, whilst SROs should seek to maintain the programme, a flexible approach will be applied to these dates acknowledging the uncertainties associated with the Development Consent Order (DCO) pre-application stage of major projects such as STT and also the outcome of the final WRMPs.

	• Whilst noting the general points above, for the gate three assumed target date they have indicated January 2025 in the gate three documentation. It would be helpful if this was acknowledged by RAPID as the first quarter 2025 (ie by March 2025) which then coincides with the end of Asset Management Plan 7 (AMP 7) and aligns with other STT SRO end of gate three target dates. **Funding** • The final gate two out-turn expenditure is £6.745M compared with a reported estimate at gate two of £7.205M. • They note that the funding for AMP 8 (for any remaining gate three activities, gate four and construction) will be determined through the PR24 process and that is expected to include mechanisms for managing uncertainty across the SRO portfolio. • The solution owners request that RAPID's final response confirms this principle as this will be essential to enabling them to fund additional work in this area, should it be required. • Note that the forecast in Table 3 assumes STT is to be construction ready in AMP 8, with gate three occurring in Q1 2025. Should changes in the STT programme be agreed as a result of WRMP outcomes this could result in significant prolongation, demobilisation and remobilisation costs. • Changes to the STT programme arising out of the WRMP process would be reflected in PR24 submissions and the solution owners propose to agree a revised schedule and cost forecast with RAPID at the mid-gate three checkpoint in late 2023. Should such changes in timing occur, the water companies would need to agree a mechanism with RAPID to assess performance at the end of AMP 8 and calculate cost sharing and cost efficiency. To this end, RAPID might consider introducing a further gate three checkpoint at the end of AMP 7. • Gate three forecast assumes the scope of the STT project remains as set out in the gate two submission. Should regulators not accept the use of the sources of water currently proposed, or require changes in specification which mean those sources cease to be value for money, then they would seek additional gate three allowances to allow alternative sources to be developed. **Partner arrangements** • They confirm that the partner arrangements split funding 80:10:10.

	Document consistency • They note that the gate two report concluded (similar to Mythe) that the Shrewsbury source option should not progress as part of the STT solution scope.
Oxfordshire County Council	**Decision making** • The Council expect RAPID will need to review its draft decisions to make sure that the final decisions are consistent with the recently published National Policy Statement (NPS). **Gate timing** • RAPID's draft decisions offer various gate three dates going forward. The Council query this amendment to the process which previously envisaged that schemes would be able to be compared with one another at the same time. Comparison is made more complicated with timelines dispersed over six years. **Carbon costs** • The Council believe that RAPID should continue to seek evidence that solution partners are embracing innovative designs and opportunities to generate or be powered by renewable energy and/or sequester carbon. • The Council believe that a comparable carbon assessment should be undertaken for each solution and that solutions should set out net zero carbon commitments. • They believe that RAPID should be clear in their decisions that gate submissions will require solution partners to set out the carbon costs of their proposals in relation to the government's commitments to reduce carbon emissions, and that the carbon footprint of solutions could be compared when choosing between options. • They believe that RAPID should compare each of the draft decisions to consistently seek evidence about carbon costs. • They believe that there should be an account provided of the amount of renewable energy entered into the national grid from the solution once constructed, and whether low carbon hydrogen will be available and will be used by the solution. • They note that low energy demand from the solutions once in use will not be an effective mitigation for high energy use in construction. **Water resource planning** • Oxfordshire County Council are concerned that additional water supply needed in the south east has been seriously overestimated because of incorrect population growth models and poorly evidenced environmental targets. • They assert that water companies should do more to reduce leakage and reduce demand and then the need for building new items of strategic infrastructure will be reduced.

	• They believe that there are other options which could provide water supply which are not included in the RAPID gated process. They think that the regulators' funding should also support the development of a wide range of options including smaller, more innovative and less environmentally damaging solutions. They state that resilient schemes such as water recycling, water transfers, and desalination should be prioritised so that other options such as the SESRO are not needed. • They would like to see funding, for example, of nature-based catchment management schemes where projects are developed to retain water, manage flood risk and create new nature reserves, alongside a much greater focus on aquifer recharging. • They believe that RAPID needs to focus much harder on building early resilience to the accelerating, increasingly malign and radically uncertain impacts of climate change. Radical uncertainty in the face of existential threats requires a "least risk" approach. **Solution progression** • The Council state that RAPID's draft decision on the STT appears overly negative although it is recognised there are environmental concerns, particularly about construction over such a long distance. Either option for the interconnector route will bring water into the water-stressed south east from areas with higher rainfall which are likely to be less affected by more extreme climate impacts, and a pipeline or canal will have fewer ongoing adverse effects than a SESRO. They state that Vyrnwy is in an area likely to maintain high winter rainfall, and the use of recycled water from the Severn Trent Sources appears to make this more resilient. They support the fact that RAPID's draft decision asks for both route options to continue to be investigated. • The Council believe that STT should be brought forward in time. They think that SESRO is not needed, noting that STT can be progressed earlier. • They believe that RAPID's decision should be amended to support the companies to progress work needed for the DCO application along the timeline suggested to lodge the planning application in July 2026. They agree with the additional allocation of development funding that RAPID proposes, which is still considerably less than that identified for the SESRO. **Stakeholder engagement** • Relevant planning authorities and local councils need to be involved in providing preapplication advice. They agree that the companies need to further develop customer and stakeholder engagement.

	• RAPID should clearly state in its decisions that to progress any strategic water resource option, advice from local authorities is critical and schemes need to be informed by consultation with local communities. **Water resource planning** • Oxfordshire County Council state that the top priority needs to be building resilience to unpredictable and rapidly evolving climate impacts. They believe that this would result in a fundamentally different prioritisation based on resilience to future water shortages and speed of delivery. Given the urgency of climate change, they believe that the need for new items of strategic infrastructure that will take a long time to build is over-estimated relative to the need for smaller schemes that can be brought forward quickly and provide resilient sources of water. They favour the use of existing or refurbished infrastructure, such as the canal transfers, or infrastructure which is underground, such as pipelines.
Wantage Town Council	**Solution costs** • Wantage Town Council are concerned that the submission documents are not transparent about the impact of solution development on customer bills. **Stakeholder engagement** • Wantage Town Council assert that the process of selecting and engaging consultees should ensure that all relevant stakeholders are included in the decision-making process. It may be that many other parishes may not be aware of these projects and the need to respond. It is believed that Wantage Town Council residents will be affected by the associated costs reflected in their bills, as well as potential construction traffic and the impact on the local nearby environment. **Best value planning** • The Council express concerns about the project delivery, as the current format does not guarantee the attainment of the "best" outcome in terms of both the environment and cost to customers. Additionally, the assessment process seems to exclude non-capital project solutions that may mitigate the need for these projects, such as addressing leaks, giving the impression of a predisposition towards approval. **Environment** • The Council assert that there is a lack of discussion within RAPID regarding addressing essential needs, such as ensuring the implementation of infrastructure to protect the environment and prevent the release of raw sewage into waterways. **Document consistency** • Wantage Town Council highlight there is inconsistent wording in Figure 3 across SESRO, STT and Thames to Southern Transfer (T2ST) decision documents.

	Water resource planning • Wantage Town Council suggest that the gated process should take into account the true potential costs to customers in future billing, using the most up-to-date figures and forecasts. It is felt that these figures should be made easily accessible to stakeholders, such as customers, to facilitate engagement and understanding. The Council suggests that the regulator explicitly mandates such accessibility in its decision-making process.
Historic England	**Historic environment** • The historic environment was not mentioned in the documentation. Historic England would welcome a recognition that the impact of the scheme of the historic environment could potentially affect choice and acceptability of scheme options. • Recommend desk-based assessment for the route corridor followed by geophysics and targeted archaeological evaluation trenching as required. • STT have the opportunity to explore options for co-funding canals. associated with eg heritage-based regeneration. • Notes that United Utilities Initial Environmental Appraisal considers heritage at high level and identifies heritage impacts for some parts of the scheme (particularly the pipeline) but states no works within designated areas. Historic England welcome further engagement with the solution owners and also request detailed Historic Impact Assessment to understand impacts and inform scheme design. **Stakeholder engagement** • They agree that the submission falls short in relation to stakeholder engagement. They note that only limited engagement has been carried out with Historic England to date. • They suggest a deep dive into environmental and cultural costs/benefits regarding Wales prior to gate three and that detailed work on costs/benefits of the canal option is also presented. • Historic England are supportive of further engagement around Cotswold canal options because there is potential for a canal option to address heritage at risk and bring wider public benefits. • They support the decision for a gate three checkpoint and request actions to explicitly address heritage issues. • They are aware the STT project team have put a pause on arranging further engagement with HE pending their review of responses to the Thames Water dWRMP.
Group against reservoir development (GARD)	**Water resource planning** • GARD believes that neither Abingdon reservoir nor the STT is needed if Thames Water and Affinity Water meet government

	leakage and PCC targets and abstraction reductions are realistically prioritised. They assert that building infrastructure is insurance against failure to meet these targets. They suggest that this "insurance" should be in the region of 100-200 megalitres per day (Ml/d). • They believe that overestimation of the supply demand deficit is largely due to abstraction reductions which GARD argue are not economically or environmentally justified. They propose that some reductions in sensitive chalk streams should be brought forward to the early 2030s. They propose that no decisions should be taken on the need and choice of new resource schemes until prioritisation of abstraction reductions has been completed. • They think that the initial STT aqueduct capacity of 500 Ml/d, as put forward in Thames Water's preferred plan for their draft WRMP, is too high. They think it inconceivable that this amount of transfer would ever be needed, especially if abstraction reductions for improved river flows are properly prioritised, with account taken of the costs and environmental impacts of replacement sources. **Carbon costs** • GARD believe that STT system costs and opex carbon costs are overestimated in gate two reports, partly a reflection of the lack of co-ordination of the different parts of the STT schemes, and, as a result inconsistent approaches and assumptions abound. Issues include: o Gate two reports calculate opex and carbon opex as though the STT were operating for 100% at full flow. o Serious error comes from an assumption that the STT opex carbon is counted from a start date in the 2020s, which is completely unfeasible for a project whose planning shows an earliest start date in 2035. • They have made the following suggestions for change before gate three so that opex carbon can be compared with SESRO: 1. Comparison over the same planning period for both Abingdon and STT, from their earliest feasible start dates (2035 for STT, and 2040 for Abingdon) 2. Realistic operational use figures for STT. 3. Evaluation of the Reservoir greenhouse gas emission carbon for inclusion in the Reservoir opex carbon. 4. Inclusion of energy recovery possibilities in the STT components. 5. Evaluation of water treatment power requirements for the Abingdon Reservoir.

	6. A proper road-map evaluation of the possibilities of decarbonisation of the chemical production – consistent with the Grid decarbonisation assumptions used. **Decision making** • GARD propose that Ofwat's gate two decision report should specify an interim checkpoint in gate three in which the capacity, transfer method (pipeline or Cotswold Canal) and sequence of support sources are pinned down. This would require cost estimates to be prepared for the scheme as a whole and would allow a proper comparison with Abingdon reservoir. **Interconnectedness** • GARD express the need for STT system to be viewed as a single scheme in their response to Ofwat's gate one decisions and it is disappointing that this has not been recognised in the gate two work or Ofwat's gate two decisions. **Solution costs** • They believe that although there is now a fair amount of cost detail available in the gate two reports for the strategic options, there are no option cost comparisons to justify the selection of options and their sequence of development. These comparisons might be expected to be prominently available in regional plans and the WRMPs, but there are none to be seen. They think that this is a major failing in transparency which needs to be addressed in gate three. **Solution design** • GARD assert that STT deployable output is underestimated. They propose that Ofwat's gate two decision report should state that the independent review they have advocated for the stochastic data and Pywr modelling of Abingdon reservoir should include the assessment of deployable output of the unsupported STT. This should form part of the evidence needed for the interim STT checkpoint that they have advocated in Section 4.2. • They think that Ofwat's gate two decision report should require a properly evidenced and transparent report determining the amount of regulation release that can be discharged into the River Vyrnwy. • GARD propose that, as part of the supporting evidence needed in gate three, the Environment Agency should provide detailed, publicly available evidence for the following: 1. The Deerhurst and Culham minimum required flows. 2. The 25 Ml/d limitation on the amount of regulation releases discharged to the River Vyrnwy. 3. The need for treatment of STT water at Deerhurst before transfer through the aqueduct.

	• GARD suggest that in preparing the supporting evidence for these decisions, the Environment Agency should liaise with the water companies to understand the implications of their decisions on SRO deployable outputs and costs. Presentation of the deployable output and cost implications should form part of the supporting evidence.

3.2 Our response

We have taken the representations into account in our final decisions and set out below our response to the key points and issues raised. For the representations or parts of representations which indicate support, provide information or give an update without raising key points and issues, we do not provide a response below but are grateful for the comments provided and confirm that we have also taken these into account.

3.2.1 Carbon costs

We consider that the level of information presented on carbon is sufficient for gate two. Solution development to gate three should continue to build from the gate two submissions. In particular, our gate three guidance asks solutions to continue to follow the Water Resources Planning Guidelines for WRMP24 section 8.3.2 (published in April 2022) which states expectations for accounting for and reducing greenhouse gas emissions. In Wales, expectations are set out in section 3 of the guiding principles (published April 2016) for WRMPs. We are asking companies to reduce and mitigate embodied carbon as much as possible using standard approaches and appropriate frameworks. On 6 January 2022, Ofwat published its net zero principles position paper[4]. Solutions should be designed in line with these principles. In particular, companies are encouraged to ensure solutions:

- are reflective of national government targets on net zero;
- prioritise the reduction of GHG emissions before the use of offsets, doing so in line with the IEMA GHG Management Hierarchy[5] and;
- clearly address both operation and embedded emissions.

[4] https://www.ofwat.gov.uk/publication/net-zero-principles-position-paper/

[5] The GHG Management Hierarchy, as detailed by the Institute of Environmental Management and Assessment (2020 version), is a framework that organisations can use to guide the scoping and strategic planning of their energy and carbon management activities.

3.2.2 Decision making

The National Policy Statement (NPS) for Water Resources Infrastructure will be used as the primary basis for examination by the Examining Authority of DCO applications for water resources nationally significant infrastructure projects. It will also be used by the Secretary of State in making decisions on those applications and may be a material consideration in making decisions on water resources infrastructure development that falls within the local authority planning regimes. As such, the solution owners will need to address the NPS for Water Resources Infrastructure in the applications that they make at a later stage for development consent orders or planning consents. However, it is not a relevant consideration for Ofwat's earlier decisions at gate two on the continuation of funding for progressing the solutions to gate three.

There was a suggestion for a single option to be specified at an interim gate three checkpoint. We do not expect solution owners to produce this level of detail before gate three. By gate three, solution owners should have narrowed down their solution to a firm single, potentially scalable option including location, as included in final regional plans and WRMPs.

We would like to clarify that all solutions have regular checkpoints with us to monitor progress and resolve issues in between gates. We have created the option of a conditional review point before gate three for schemes that are at significant risk of change through further development of the relevant WRMPs and/or where other significant issues may affect the future progress of the schemes. This enables the solution to provide updated information on these matters and, if necessary, for Ofwat at the conditional review point to make a further decision on whether the solution should progress further and, if so, the terms on which it should progress. We have provided for the option of such a conditional review point for STT and consider that this is sufficient to deal with currently identified issues that may affect progress of STT at that time.

3.2.3 Best value planning

Water resources planning at a regional and company level is following a best value approach. This allows consideration of how solutions can be used to bring about best value at a national and regional scale. Solutions such as the STT and SESRO are not mutually exclusive. The need for solutions and the decisions on whether or not solutions ultimately go ahead will be made through water resources planning processes and subsequent applications for planning and environmental consents.

3.2.4 Document consistency

The STT gate two submission concluded that the Shrewsbury source option should not progress as part of the STT solution scope. We are amending the summary and map in the final decision document to reflect this change.

Inconsistent wording in Figure 3 across SESRO, STT and T2ST decision documents was identified. The categories used in Figure 3 are good, satisfactory and poor, where "good" indicates "meets expectations", "satisfactory" indicates "falls short of meeting expectations in some areas" and "poor" indicates "falls short of meeting expectations in many areas". Any inconsistency in wording used does not change our decision and we have decided to maintain the wording in the figure.

3.2.5 Solution costs

We are mindful of the financial burden that the solutions will place on current and future generations, however future customers will benefit from the additional water resource. At this stage of the solution's development, Ofwat does not consider it appropriate to ask solution owners to measure the impact on customer bills. Cost estimates are still relatively immature, and any measurement of an impact on customer bills is likely to be misleading at this time. Furthermore, the solution is likely to be delivered by an external delivery partner, hence it will not increase the Regulated Capital Value of water companies.

3.2.6 Funding

We have considered the representations made on the gate three allowance and have considered further the interests of customers over the lifecycle of the solution's development and delivery. As a consequence, we have decided to increase funding for gate three. We will consider gate four expenditure either as part of the gate three decision or PR24, as appropriate. We confirm that any funding for AMP 8 will be decided through the PR24 process.

The RAPID gate two draft decision document indicated that STT should receive an extra £17.03m for Gate Three while funding for SESRO was unchanged. The total gate three allowance for STT was £40.34m while that of SESRO was £42.60m. As a result of the RAPID gate three final decisions, the total gate three allowance for STT is now £49.50m while that for SESRO is unchanged. We do not see a material disparity in funding between the two schemes.

We have adjusted Table 4 of the final decision to reflect these changes and have added some explanatory text to section 4.2.

We have updated the text in section 4.3 to reflect the change in final gate two expenditure derived from the final gate two accounts.

3.2.7 Solution design

There were concerns from one stakeholder around stochastic data. We expect all technical work and modelling to have undergone review and quality assurance. Activities should follow best practice guidance where relevant, and to state this in submissions. Specifically on stochastic data, consultant investigations have been commissioned by the regional groups that have reported on comparisons of stochastic data sets, including those used by the regional groups, and alternatives. The regional groups have also held workshops for wider stakeholders on methods used and have made data available for wider stakeholder use through these workshops.

There was a request from GARD for more evidence around the Deerhurst and Culham minimum flow requirements. Indications of the potential "Hands Off Flow" (HOF) to be set at Deerhurst for STT have not changed since RAPID last spoke with GARD in 2020. For SESRO, the Environment Agency agree that appropriate HOFs need to be established in accordance with the Environment Agency's Thames Catchment Abstraction Management Strategy (TCAMS) and that indicative flows will be refined further in gate three.

The environmental evidence and assessments completed to date by STT indicates that 175 Ml/d is the maximum capacity of the Afon Vyrnwy before deterioration is likely. Once compensation flows and River Severn Regulation releases are taken into account, this only allows for a sustainable STT release of 25 Ml/d.

GARD believe that the need for treatment of STT water at Deerhurst before transfer through the aqueduct should be evidenced. We can clarify that water treatment will be required where a water transfer poses environmental risk and water companies are the ones responsible for designing appropriate treatment. The evidence to support a solution is produced by the water companies and the Environment Agency will assess this evidence alongside other relevant information to determine whether a solution meets environmental requirements and therefore, is acceptable to permit. Any permitting decisions will be appropriately evidenced.

3.2.8 Environment

Members of the public and stakeholders have raised concerns about the potential negative environmental impact of the solution including decreasing water levels and quality as well as negatively affecting the riverine ecology in the River Severn. We believe that extensive environmental assessment and modelling has been undertaken and largely meets expectations for gate two. Whilst the gate two submission has identified potential risks from

the scheme, there is still more work required to understand the significance of these impacts and whether they can be mitigated. There are risks to the solution's feasibility from water quality, flow changes and the likely, if any, impact of the Severn Estuary Habitat Directive site and its functionally linked catchments. We have asked STT as part of our gate two decision to complete a number of priority actions related to these concerns.

There was concern raised by stakeholders and members of the public that there was not enough focus on the environment in the gated assessment. Along with the other partner regulators in RAPID, Ofwat works with water companies as they develop solutions to ensure that their assessments meet gate requirements and undertake the necessary environmental monitoring and assessment to understand the environmental impact of the solution, mitigation required, and opportunities to improve the environment. Any solution that is built will have to limit environmental impact and provide mitigation where required. All new development schemes are expected to be required to provide 10% biodiversity net gain in addition to any mitigation measures. We will work with Thames Water, Severn Trent Water and United Utilities to ensure that a solution with good environmental performance is developed, if it is taken forward. For the solution to proceed it would need to obtain environmental permits and a DCO or local planning permission. These would require a full Environmental Impact Assessment to be carried out which highlights environmental impacts and how they will be mitigated both through construction and operation of the solution.

The water companies request that the priority actions 2 and 3 recognise that whilst progress should be made by December 2023 based on the results of bench tests, there will be further work required in gate three to fully address the environmental uncertainties identified. We agree that completion of bench tests and presentation of results by the December 2023 checkpoint will be sufficient. We have reworded the priority action 2 to clarify this point.

Some stakeholders assert that there is a lack of discussion within RAPID regarding addressing essential needs, such as ensuring the implementation of infrastructure to protect our environment and prevent the release of raw sewage into our waterways. RAPID's current remit is to provide oversight of the gated process established to support, review and challenge the development and delivery of the strategic water resource solutions funded as part of the 2019 price review. Part of the reason why these solutions are being developed is to protect, improve and enhance the environment. The amount of water available for water supply has reduced to meet environmental objectives, affecting in part the need for new solutions. Each solution will need to comply with environmental legislation, undertake detailed environmental investigations and demonstrate how they will make a positive contribution to the environment and society. The regulators that look after the environment are fully involved by RAPID at every stage of this programme and water companies also have duties in relation to environmental protection.

3.2.9 Loss of amenity

We understand the concern about impacts from construction of the solution, including construction traffic, on local communities and on the environment, for example on trees. We also understand the concern about the loss of amenity for users of the River Severn for recreational purposes. The impacts on amenity, recreation and the environment will be considered in more detail through the planning process and stakeholders should engage with the relevant planning consultations and processes to raise these concerns. RAPID is not the decision maker on DCO applications for Nationally Significant Infrastructure Projects, on applications for local planning permissions, or on the granting of permissions from environmental regulators. Those will progress through their own processes and decision-making regulators, with relevant consultation. Engagement with local stakeholder and regulators as part of the RAPID process will increase during gate three, to support awareness of the solution proposals and the understanding of local details.

3.2.10 Wider Environment Agency support

We believe that further work is still required in particular to address Habitat Regulations Assessment (HRA) concerns and risks. As those concerns are not yet fully addressed, we still have some concern about the solution's viability. However, this concern can be overcome by demonstrating the desired outcomes through the priority actions. Our gate three guidance also requires companies to provide further information on their proposals to address HRA concerns, risks and necessary mitigation.

3.2.11 Fixing leaks

Whilst we agree that reducing leakage and being more efficient in our use of water both have a large role to play, this will not be sufficient to solve the future water deficit problem alone. Infrastructure options will be selected as part of regional plans and WRMPs. These plans consider both demand side measures and supply side measures as part of the twin track approach to water resources. The national framework – published by the Environment Agency in 2020 – set out expectations that the industry reduces demand to around 110 litres per person per day and reduces leakage by 50% both by 2050. Even with these reductions in demand, the water sector is going to need to invest in infrastructure to improve drought resilience, reduce the impact of abstraction on the environment, supply a growing population and adapt to climate impacts.

3.2.12 Gate timing

The solution owners have requested that the gate three timing be Q1 2025, noting the dates are 'earliest target dates'. We confirm that, in alignment with NWT and STS, gate three is March 2025 but the solution owners must advise RAPID of any further changes to this.

There were some representations requesting clarity about the timing of the remaining gates. The solutions are due to start construction at different times in accordance with the times at which there is projected to be a need for the water resources provided by each solution. Therefore, after gate two, the solutions need to follow different timetables. Beyond gate two, gate alignment across the whole programme becomes less important. It is more important the gates align with pre-planning and/or DCO application activities. Beyond gate three, the timings also become more dependent on external factors such as the planning application and/or DCO process. The need for flexibility and bespoke solution gate timings will be reflected in future decisions.

3.2.13 Historic environment

A lack of reference to the historic environment and engagement with relevant stakeholders was raised in a representation. During further progress through the gated process, solution owners will continue to develop their environmental assessments, including consideration of the historic environment. A DCO application or an application for local planning permission for the solution will need to be supported by an Environmental Impact Assessment in which the effects of the solution on the historic environment will be assessed and proposals for mitigating any adverse effects will be included. The acceptability of the effects and mitigation will be a matter for the authorities determining those applications and will not be a decision reached by the gated process.

We do agree that progress of the solutions would benefit by an early engagement with Historic England and have amended priority action 1 to specifically request engagement with Historic England.

3.2.14 Interconnectedness

RAPID took a decision at gate one that STT should continue to be developed separately to other solutions supporting STT. It is recognised that, as water resources planning and the gated process advances, these supporting solutions may provide resilience benefits to their own regions, to other solutions, or to other regions beyond those served by STT itself. Linking the development of supporting solutions, and their ability to progress through the gated process, exclusively to STT, could hinder investigation of these alternate configurations and their benefits.

Whilst assessing these solutions individually through the gated process, RAPID also reviews them within the STT system they may collectively create. As the solutions progress through gate three and alignment to the final water resource management plans occurs, RAPID will continue to look at solutions in an integrated way across the STT system, as well as at the individual solutions.

3.2.15 Solution progression

The water resource management planning process drives the choice of solutions in the RAPID programme. The gated process interacts with the regional planning and statutory company-level water resource management plan (WRMP) development processes and much of the evidence base for gate two will be included in material produced in consultations on those plans.

The solution could be slowed down if it is not on a preferred pathway in the relevant WRMP. While solutions on preferred pathways should proceed to develop planning and consent applications and procurement, solutions on alternative pathways should continue with evidence investigations and any other gated activities which enable the solution owners to switch to delivering these solutions, in line with trigger points and decision points in their regional plan or WRMP as appropriate.

The funding allowance for solutions on alternative pathways will be reduced accordingly and solution owners should set out proposals for this in their gate three submissions.

The purpose of the checkpoint in December 2023 is to provide a deadline for the companies to produce evidence to satisfy RAPID that the priority actions have been completed. We regularly meet with the solution owners to monitor progress on actions and priority actions between gates. A conditional review point may be set if we are not satisfied there is sufficient evidence provided by December 2023 and we may decide that the solution should not progress beyond the conditional review point or should only progress subject to further priority actions, actions or recommendations.

Some stakeholders understood that solutions would "drop out" at gate two. The gated process enables solutions to drop out if there are fundamental issues or risks that cannot be mitigated and funding for further investigation will cease. For instance, Fawley Desalination plant was removed from the gated process at gate two in 2021. Based on the detailed assessment we have completed on the STT gate two submission, Ofwat believes that STT merits further investigation and that the solution should receive further development funding to progress to gate three.

There was some concern that the decision to develop solutions will be a political one rather than one based on robust technical information. The gated process is intended to support companies in progressing investigation and development of solutions in the RAPID

programme to a high standard. RAPID assesses work done at each gate against three assessment criteria: robustness, consistency and uncertainty. RAPID uses these criteria to assess whether the submission meets expectations, falls short of expectations in some or many areas, or is unacceptable. RAPID then makes a recommendation to Ofwat about whether companies should continue to receive funding to further investigate the solution.

3.2.16 Stakeholder engagement

We agree that stakeholder engagement is important and believe that the priority action to be completed by December 2023 addresses the concerns raised in representations. Furthermore, solutions will need to follow gate three engagement guidance which include:

- Pre-planning statutory consultation as described in The Planning Inspectorate Advice note 11: working with public bodies in the infrastructureplanning process and Annexes A-H[6]
- Plans showing ongoing and continued engagement, that have been shared with public and statutory bodies, including any required enhanced advisory services.
- Customer engagement, particularly on changes of source where relevant.
- Engagement with all stakeholders affected by the solution's development.

3.2.17 Water resource planning

There were several representations relating to water resource planning issues such as the population, climate change and abstraction reduction data used to build the needs case for the solutions. We expect the water resources planning process to assess the need for these solutions and the socioeconomic assumptions such as those around population growth underpinning the modelling for these processes.

There were concerns that water companies should do more to reduce leakage and reduce demand which would mean that the need for building new items of strategic infrastructure will be reduced. Whilst reducing leakage and being more efficient in using water both have a significant role to play, it will not be sufficient alone to ensure security of water supplies in the future. Water resources infrastructure options are considered and selected as part of regional plans and water resource management plans. These plans consider both demand side measures and supply side measures as part of a twin track approach to water resources and determine the need for new water resource infrastructure. Neither Ofwat nor RAPID has a decision-making role in regional plans or water resource management plans.

[6] https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

There are several water transfer solutions being considered within the RAPID programme including the North West Transfer and STT. However, it is the water resource management planning processes that drive companies' decisions regarding which solutions they promote through the RAPID programme, including the sequencing and timing of the solutions. The gated process interacts with the regional planning and statutory company-level water resource management plan (WRMP) development processes.

Some stakeholders are concerned that there are other options that could provide water supply which are not included in the RAPID gated process, including smaller schemes that could build early resilience to climate change. Other stakeholders favour the use of existing or refurbished infrastructure, such as the canal transfers, or infrastructure which is underground. The funding allocated to RAPID supports the acceleration of regional solutions that we expect to play a significant role in long-term resilience, and will feature in future company business plans and water resources management plans. These regional and inter-regional solutions are complemented by the delivery of other solutions identified in companies' business plans within supply-demand balance enhancement programmes which include smaller supply options, improved connectivity of networks, water efficiency programmes and leakage management. Ofwat promotes water companies to adopt innovative approaches to drive up their performance, whilst tackling the resilience of the networks and water supply and maintaining best value for customers.

We also received representations expressing concern about strategic reservoirs being the preferred option and about the environmental damage and carbon emissions associated with them. The RAPID programme has included different types of solutions including transfers, water recycling and desalination. The Fawley desalination solution left the RAPID programme in 2021. Several transfer and water recycling solutions continue to be part of the RAPID programme. Additional solutions can enter the RAPID programme if they are proposed by water companies and meet the programme criteria, which are outlined in published guidance.

3.3 Other changes to our draft decisions

3.3.1 Area that we have changed not as a result of a representation

We have decided that the best value deep dive session as described in recommendation 5 should be attended by STT only, rather than all three solutions related to the STT system. This will provide an opportunity to focus solely on the best value aspects of STT which are most relevant to the solution progression.

Although not challenged through representations, we are removing the cost sharing arrangements for gate three which were in our draft decision and are instead capping the

allowance at a higher level. We have added some text to section 4.2 to explain the reasoning behind this decision.

To support our decision on whether to set a conditional review point, we have set a new priority action to report on the expenditure incurred up to December 2023 and a revised forecast of expenditure to gate three, for RAPID to consider alongside progress against the other priority actions in Appendix A.

4. Solution assessment summary

Table 2. Final decision summary

Recommendation item	River Severn to River Thames Transfer
Solution owners	Thames Water, Severn Trent Water and United Utilities
Should further funding be allowed for the solution to progress to gate three?	Yes, subject to any decisions taken at a Conditional Review Point
Is there evidence all expenditure is efficient and should be allowed?	Yes
Delivery incentive penalty?	No
Is there any change to partner arrangements?	Yes, set out in section 7.
Are there priority actions for urgent completion?	Yes, set out in section 5.1.
Are all priority actions and actions from previous gates addressed?	No, set out in section 5.2.
Suitable timing for gate three has been proposed	RAPID have agreed gate three as March 2025 to align with other related solutions.

4.1 Solution progression to standard gate three

The evidence suggests that the solution is a potentially valuable way of supplying water to customers. Based on our assessment of a wide range of areas that could concern the progression of the solution, we have concluded that the solution should progress through the gated process to gate three, subject to the possibility that, after considering Thames Water's, Severn Trent Water's and United Utilities' submissions in response to the priority actions set out in Appendix A at the regular checkpoint in December 2023, we may decide to set a conditional review point (Conditional Review Point) at which we may decide that the solution should not progress beyond the Conditional Review Point or should only progress subject to further priority actions, actions or recommendations. Figure 2 below summarises the area of any progression concerns, including indication of the significance. The reasons for this assessment conclusion are set out in table 3 below.

Decisions on funding as a result of this progression decision, are set out in section 4.2.

Figure 2. Assessment of solution's progression concerns

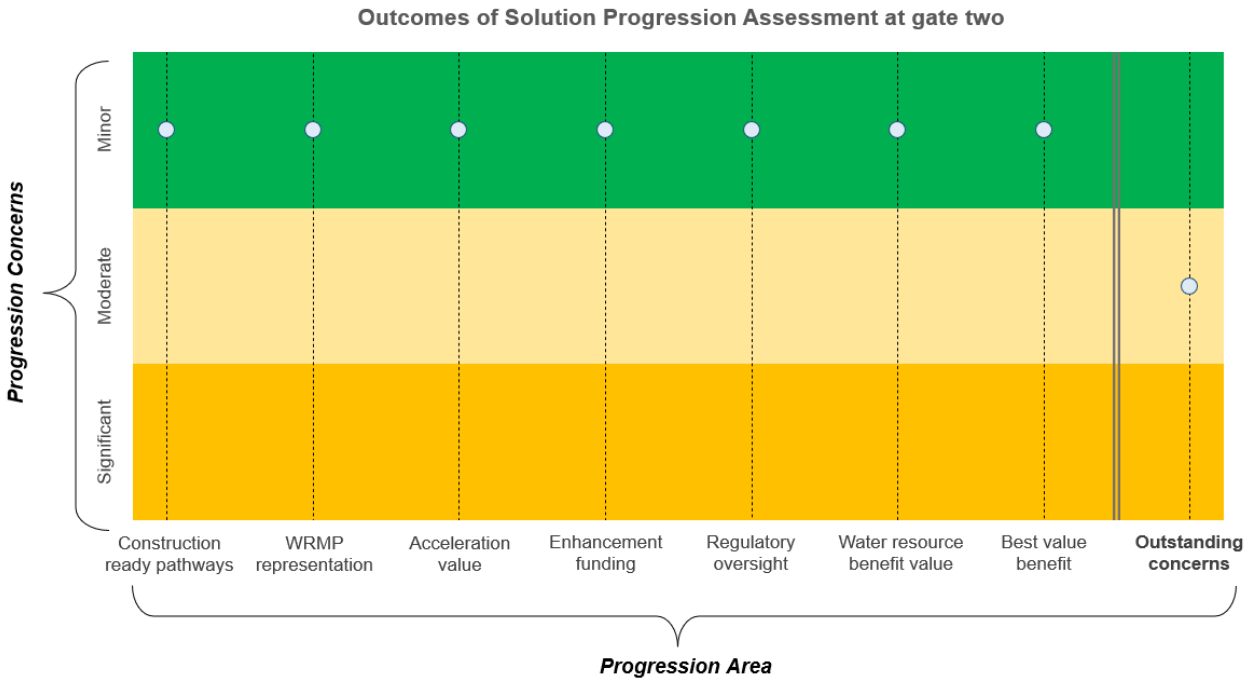


Table 3. Final decision progression criteria

Progression criteria	River Severn to River Thames Transfer
Solution owners	Thames Water, Severn Trent Water and United Utilities
Is the solution in a preferred or alternative pathway in relevant regional plan or WRMP (where applicable) to be construction ready by 2030?	Yes, the solution is chosen in Thames Water draft Water Resource Management Plan 2024 (WRMP24), as a solution on its preferred pathway, which is the relevant plan for the standard track. The solution is also in the Water Resources South East (WRSE) and Water Resources West (WRW) draft regional plan. The solution will be construction ready by 2028.
	No further action is required on this progression criteria.
Do regulators have any significant concerns with the solution's inclusion or non-inclusion in a WRMP or regional plan or with any aspects that may impact its selection, to a level that they have (or intend to) represent on it when consulted?	No, the regulators do not have concerns on how the solution is represented, or the information about it, in Thames Water's, Severn Trent Water's and United Utilities' draft WRMP24. However, we note differences between the WRSE and WRW plans on the timing of the River Severn to River Thames Transfer. WRW and WRSE should represent this option consistently in the final plans.
	No further action is required on this progression criteria.
Is there value in accelerating the solution's development to meet a company's or region's forecast supply deficit?	Yes. A solution is required to address Thames Water's forecast deficit.
	No further action is required on this progression criteria.

Does the solution need continued enhancement funding for investigations and development to progress?	Yes. Continued funding is required to develop a solution to be delivered in time for the planned construction ready date.
	No further action is required on this progression criteria.
Does the solution need the continued regulatory support and oversight provided by the Ofwat gated process and RAPID?	Yes. The solution will continue to benefit from the regulatory support and oversight provided by being included in the RAPID programme.
	No further action is required on this progression criteria.
Does the solution provide a similar or better cost / water resource benefit ratio compared to other solutions?	Yes. This solution does provide a similar or better cost / water resource benefit ratio compared to other solutions.
	No further action is required on this progression criteria.
Does the solution have the potential to provide similar or better value (environmental, social and economic value – aligned with the Water Resources Planning Guideline) compared to other solutions?	Yes, this solution has the potential to provide similar or better value (environmental, social and economic value – aligned with the Water Resources Planning Guideline) compared to other solutions.
	No further action is required on this progression criteria.
Does a regulator or regulators have outstanding concerns that have not been addressed through the strategic planning processes taking into account proposed mitigation?	Yes. Outstanding concerns remain around stakeholder engagement, key programme delivery risks and impacts on the Severn Estuary Habitat Directive site, as well as Water Framework Directive compliance.
	This progression concern is addressed in priority actions 1 and 2 in Appendix A of this document.

4.2 Solution funding to standard gate three

We are changing the funding of this solution. The details of this funding decision are set out in table 4 below, and details on forward programme in section 8.1.

Table 4. River Severn to River Thames Transfer funding allowances (2017/18 Prices)

	Gate one	Gate two	Gate three	Gate four	Total
River Severn to River Thames Transfer gated allowance	£6.66m	£9.99m	£49.50m	£26.64m	£92.79m
Comment	10% of development allowance calculated as 6% of total solution costs	15% of development allowance calculated as 6% of total solution costs	Allowance has been revised and capped.	We will review gate four expenditure as part of gate three assessment or PR24.	Updated to reflect revised gate three expenditure cap.
Previous Allowance	£6.66m	£9.99m	£23.31m	£26.64m	£66.60m
Change from Previous Allowance	£0.00m	£0.00m	£26.20m	£0.00m	£26.20m

This funding has been revised to account for forecast costs at gate three. We have determined that across all solutions gate three costs have risen due to factors such as increases in solution design costs, changes in scope and additional funding required to develop the environmental impact assessment (EIA), water quality assessments, ground investigations and other environmental field studies and assessments.

River Severn to River Thames Transfer will be allowed to spend up to £49.50 million to undertake gate three activities, representing an increase of £9.17 million from our draft decision. This figure has been reached based on funding 100% of the forecast costs for gate three. We are not amending the gate four allowances at this point.

We are removing the cost sharing arrangements for gate three which were in our draft decision and are instead capping the allowance at a higher level. This means that the solution may pass on the costs of gate three development but only up to the higher cap. The solution will be allowed to use its previous underspends to offset expenditure above the cap to provide some flexibility against cost uncertainty.

These arrangements will be implemented through the PR19 reconciliation mechanism. The impact on the solution owners of any expenditure above or below the cap will depend on the extent to which the solution was already funded at PR19.

The solution may bring forward some gate four activities, which can be funded from the gate four allowance. There must be a clear rationale for undertaking the expenditure early, including evidence of the benefits of doing so instead of waiting for greater solution certainty.

We confirm that any funding for AMP 8 will be decided through the PR24 process.

4.3 Evidence of efficient expenditure

The PR19 final determination specified that any expenditure on activities outside the gate activities for the identified solutions (or solutions that transfer in) will be considered as inefficient and be returned to customers. We will consider whether gate activity is efficient by considering the relevance, timeliness, completeness, and quality of the submission which should be supported by benchmarking and assurance.

River Severn to River Thames Transfer has carried forward £2.65m underspend from gate one, increasing the allowance available to them at gate two to £12.63m.

Our assessment of the efficient costs as spent on standard gate two activities results in an allowance for this solution of £6.75m (of £6.75m claimed). River Severn to River Thames Transfer has therefore underspent its combined gates one and two allowance by £5.89m and may take this underspend forward to gate three, subject to any decisions taken at a

Conditional Review Point, increasing the allowance available to them at gate three to £55.39m.

From gate two, we will move to look at the cumulative gate spend against the cumulative total allowance, across all gates consistent with the activities being undertaken. For example, any gate four allowance that is brought forward towards gate three should be for the purpose of early gate four activities. As River Severn to River Thames Transfer is progressing to gate three, this will apply here, subject to any decisions taken at the Conditional Review Point.

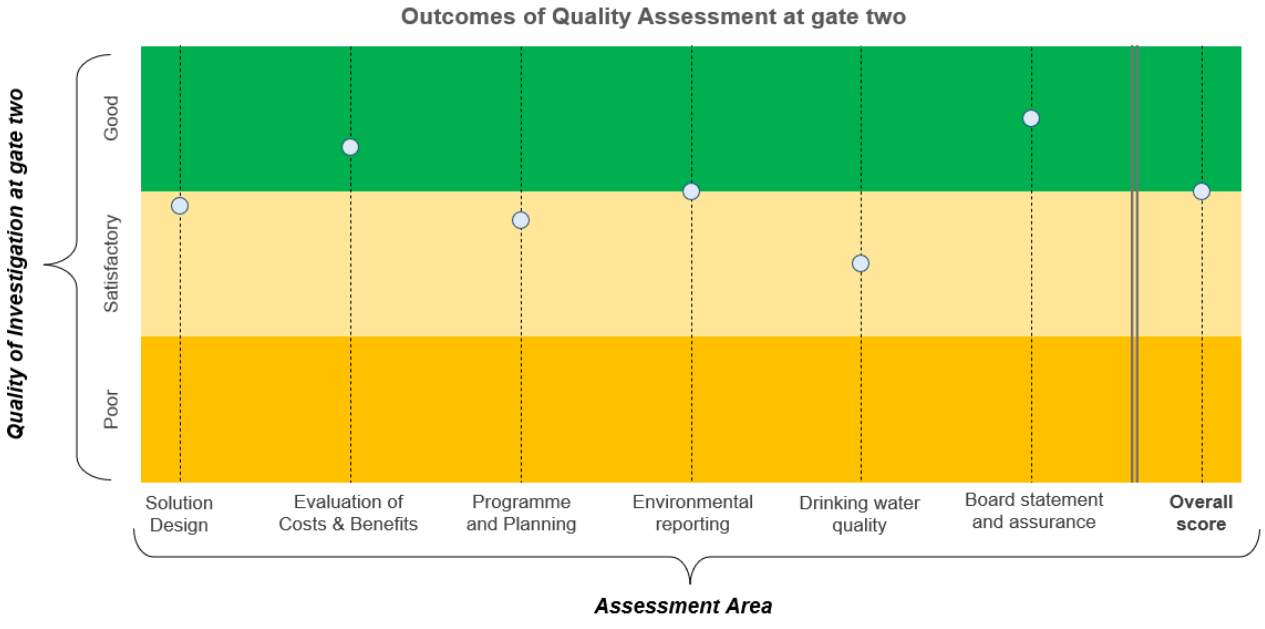
We expect the solution owners to provide a report on the expenditure incurred up to the December 2023 checkpoint and a revised forecast of expenditure to gate three.

4.4 Quality of solution development and investigation

The aim of the assessment was to determine whether gate two activities have been progressed to the completion and quality expected, for the continued development of the solution.

Figure 3 shows our assessment of the work completed on the solution, which was presented in the gate two submission. Our assessment was made against the criteria of robustness, consistency, and uncertainty to grade each area of the submission as good, satisfactory, or poor in accordance with the standard gate two guidance, (updated version published on 12 April 2022). We also assessed the Board assurance provided.

Figure 3. Assessment of quality of investigation



Our overall assessment for the solution submission is that it is a good submission but falls short of meeting gate two expectations in some areas including solution design, programme and planning and drinking water quality. We explain our assessment of each individual area, including any shortfalls in expectations, in the sections below. We have not applied any delivery incentive penalties as a result this assessment of quality, as further detailed in section 5.

4.4.1 Solution Design

Our assessment of the solution design considered the quality of the evidence provided on the initial solution and sub-options; the anticipated operational utilisation of solutions; the interaction of the solution with other proposed water resource solutions and stakeholder and customer engagement. The assessment also considered whether information was provided on the context of the solution's place within company, regional and national plans.

We consider Severn Trent Water, Thames Water and United Utilities (the companies) to have provided partially sufficient evidence of progress in developing the solution design for gate two. They have fallen short in providing enough evidence in the areas of utilisation, the interaction of the solution with other proposed water resource solutions, stakeholder and customer engagement, and alignment with company, regional and national plans.

Alignment with company, regional and national plans require improvement. The companies should confirm preferred volumes and configuration of the solution as soon as possible, ensuring that WRW and WRSE regional plans align. We expect an update on final alignments and proposals at the regular checkpoint in December 2023.

We require more evidence about anticipated operational utilisation of the solution including:

- further breakdown of utilisation by return periods to understand how the solution may be used in different events;
- further explanation of how the utilisation of the solution may change with interaction of South East Strategic Reservoir Option (SESRO), Thames to Affinity Transfer (T2AT) and Thames to Southern Transfer (T2ST);
- more detailed explanation about conjunctive benefits with other solutions, such as SESRO, T2AT and T2ST.

There has been significant engagement work, including considering Wales and Welsh legislation, delivering in response to the action at gate one "Ensure Welsh stakeholders and customers are included in solution specific engagement". However, this has focused on strategic engagement in gate two, primarily using the Water Resources West Regional Plan engagement work.

Stakeholder and customer engagement requires further development. The development of an engagement plan must occur before the gate three submission. This needs to include who, where, how and why Welsh stakeholders will be engaged. This should include the wider statutory regulators like Cadw/Planning and Environment Decisions Wales (PEDW) using a "no surprises" approach. The engagement plan should be provided by the regular checkpoint in December 2023 and ongoing updates provided through the regular checkpoints before gate three on its implementation, progress and how customer and stakeholder views have/will inform key decisions. This engagement plan, in conjunction with North West Transfer, should address the 25% of stakeholder reported feedback that was negative towards water transfer.

4.4.2 Solution costs

Our assessment of the unit costs of delivering the River Severn to River Thames Transfer is that they are reasonable at this stage and cost changes from gate one to gate two have been sufficiently explained and are as a result of detailed development of the solution or changing market conditions. For instance, there has been a reduction in the size of pipes and the size of the break pressure tank. The assessment also considers the use of the solution as a drought resilience asset, and therefore cost per capacity is often a more appropriate metric than cost per projected utilisation. We will continue to scrutinise cost estimate changes from gate two to gate three.

4.4.3 Evaluation of Costs and Benefits

Our assessment of the evaluation of costs and benefits considered the quality of the information provided on initial solution costs; the social, environmental and economic cost and benefits, water resource benefits and wider resilience benefits. The assessment also considered whether evidence was provided on how the solution delivers a best value outcome for customers and the environment.

We consider that Severn Trent Water, Thames Water and United Utilities have provided sufficient evidence of evaluating the costs and benefits of the solution to an appropriate standard for gate two. We recognise and welcome the significant work undertaken in the wider benefits study and welcome the assessment against the Sustainable Management of National Resources principles and Well-being in respect of Wales.

We would welcome a deep dive with the solution early in gate three to explore how environmental metrics have been considered and gain more clarity around the wider socio-economic benefits, including all ecosystem service benefits and cultural benefits in relation to Wales, rather than just environmental benefits. This session would clarify how best value metrics link to the wider benefits study and where WRMP24 best value guidance and the public value principles from Ofwat have been followed. For example, what has been considered for socio-economic metrics and how this has scored. For example, local markets,

labour, skills, jobs, supply chains etc. and how would these benefits be maximised through development and delivery of the solution.

4.4.4 Programme and Planning

Our assessment of the Programme and Planning considered whether Thames Water, Severn Trent Water and United Utilities presented a programme with key milestones and whether its delivery is on track. The assessment also considered the quality of the information provided on risks and issues to solution progression, the procurement and planning route strategy and subsequent gate activities with outcomes, penalty assessment criteria and incentives.

We consider the evidence provided by Severn Trent Water, Thames Water and United Utilities regarding the programme and planning, risks and issues and the procurement and planning route strategy for the River Severn to River Thames Transfer to be partially sufficient in terms of detail and quality for gate two. However, additional work is required in the areas of:

- risks and issues to solution progression;
- the procurement and planning route strategy;
- subsequent gate activities with outcomes, penalty assessment criteria and incentives.

We welcome the progress on the gate one action to "demonstrate full understanding of the risks to the solution from potential regulatory barriers, this includes risks and issues associated with the Habitats Regulations ". However, we have significant concerns about the considerable programme risk that remains because of the potential impact on the Severn Estuary Habitat Regulations site. We recognise that mitigation in the form of further modelling, monitoring and trial treatment programmes has been proposed in the gate two submission. To manage this programme risk we have set a priority action for these mitigations in terms of further monitoring and modelling to be completed by the regular checkpoint in December 2023. In addition, we expect the solution team to work closely with Minworth RAPID solution to ensure its trial treatment programme delivers the required discharge quality.

While the programme and planning score has been marked down as requirements that solution owners were funded to meet have not been met, we have made a decision that there is no longer a need for value for money assessments for RAPID solutions and therefore no associated gate two action is required.

Work provided for subsequent gate activities with outcomes, penalty assessment criteria and incentives is lacking to an extent. Clarification is required around how risk scores are defined and justification is needed for variation from quarterly risk reporting.

4.4.5 Environment

Our assessment of Environment considered the initial option-level environmental assessment; the identification of environmental risks and an outline of potential mitigation measures; the detailed programme of work used to address environmental assessment requirements and the initial outline of how the solution will take into account the carbon commitments.

We consider Severn Trent Water, Thames Water and United Utilities to have provided sufficient evidence of progress in the environmental assessment, potential mitigations, future work programmes and embodied and operational carbon commitments for gate two for the most part.

However, there remains concerns in the category of risks and potential mitigations, around the proposed advanced treatment processes at the Minworth and Netheridge Wastewater Treatment Works. We have set a priority action to address this concern that must be completed by the regular checkpoint in December 2023.

4.4.6 Drinking water quality

Our assessment of Drinking Water Quality considered drinking water quality and risk assessments; evidence that the solution has been presented to the drinking water quality team and a plan for future work to develop Drinking Water Safety Plans.

We consider Severn Trent Water, Thames Water and United Utilities to have provided partially sufficient evidence of progress in the drinking water quality risk assessment, and future work around Drinking Water Safety Plans for gate two.

The submission is lacking in the area of drinking water quality and risk assessments. The impact of the solution on all the existing downstream abstractions and their treatment capability has not been fully assessed.

It is important that the Strategic Water Quality Risk Assessment (SWQRA) considers any impact on treatment at receiving water treatment works (WTWs), particularly as changes in water source may disrupt the biological layers in slow sand filtration used in a number of potential receiving WTWs. The need for any additional mitigation/treatment at these sites needs to be fully quantified and evidenced. Ongoing monitoring will help to inform Water Quality Risk Assessments and Drinking Water Safety Plans (DWSPs) receiving this water.

The submission provides poor evidence that the solution has been presented to relevant Drinking Water Quality teams, including those at downstream water companies. We have set two priority actions firstly, to ensure all Drinking Water Quality teams are engaged, and

secondly, to review South East Water's DWSP for River Thames abstractions and include this in the SWQRA.

We would welcome clarification around:

- the SWQRA and whether an increase in pathogen loading at treatment works would present a treatment challenge. For example, although crypto risk was high and remains high, would increases in raw water loading require any additional treatment at some works eg treatment works without UV systems;
- whether the potential increased loading into the river has been formally reviewed;
- whether any increase in pathogen loading from the scheme exceed current disinfection operational envelopes;
- whether by-products from the additional treatment at Minworth have been considered eg, chlorate or trihalomethanes.

4.4.7 Board Statement and assurance

The evidence provided relating to assurance is sufficient for this stage of the gated process.

We consider that the Boards of Severn Trent Water, Thames Water and United Utilities have provided a comprehensive assurance statement and have clearly explained the evidence, information, and external / internal assurance that they have relied on in giving the statement.

5. Actions and recommendations

Where the submission has not been assessed as 'meeting expectations' in the quality assessment, or progression concerns have been raised, we have provided feedback on where we will seek remediation of the issues. We have also identified specific steps that solution owners should take in preparing for standard gate three.

We have categorised these remediation issues and steps into priority actions, actions and recommendations.

Priority actions are those that should have been completed at gate two and must now be addressed on a short timescale in order to make sure the solutions stay on track. They require urgent remediation in full.

Actions are those that should be addressed in full in the standard gate three submission. The response to these actions will influence the assessment of the gate three submission.

Recommendations are issues where additional information or clarification could improve the quality of future submissions.

We have also assessed progress on actions and recommendations from gate one.

5.1 Actions and recommendations from gate two assessment

Seven priority actions have been identified for the River Severn to River Thames Transfer, which should be delivered by the dates identified in appendix A.

Thirteen actions and recommendations have been identified for the River Severn to River Thames Transfer, which should be fully addressed at the gate three submission. Progress against actions/recommendations will be tracked as part of regular checkpoints the solution holds with us whilst undertaking gate three activities.

The full list of priority actions, actions and recommendations for the River Severn to River Thames Transfer can be found in Appendix A.

5.2 Actions and recommendations from gate one assessment

We have assessed whether the River Severn to River Thames Transfer has met actions that were set out as a result of our gate one assessment.

No priority actions were identified for the River Severn to River Thames Transfer,

Twelve actions and recommendations were identified for the River Severn to River Thames Transfer, which were expected to be fully addressed at the gate two submission.

We have decided that the actions have not been fully addressed in the gate two submission. Further detail of our conclusion against each individual action is shown in Appendix B.

6. Delivery Incentive Penalty

We have not applied delivery incentive penalties to this solution, as a result of the assessment carried out on the gate two submission.

7. Proposed changes to partner arrangements

There are the following changes proposed to partner arrangements from gate two.

Thames Water, Severn Trent Water and United Utilities propose that accountability for the interconnector, including managing the delivery of the DCO and DPC elements of the interconnector and river conveyance, lies solely with Thames Water going forwards. Continued joint working and partnership between Thames Water, Severn Trent Water and United Utilities is proposed for STT system co-ordination activities and the development of the River Vyrnwy Bypass pipeline.

The gate three split in development costs to the end of AMP7 is proposed to be changed to match the changes in accountability, with a split of 80:10:10 between Thames Water, Severn Trent Water and United Utilities. The change in partner arrangements must be from gate two onwards or it can be delayed until gate three. It cannot change at AMP cycles.

8. Gate three activities and timing

The solution will continue to be funded to gate three as part of the standard gate track, subject to any decisions at any Conditional Review Point.

For its gate three submission, we expect Thames Water, Severn Trent Water and United Utilities to complete the activities listed in PR19 final determinations: strategic regional water resources solutions appendix, as expanded on in section 7 of the solutions gate two submission. Activities are expected to be completed in line with delivery incentives and expectations set out in RAPID's gate three guidance. We also expect the actions listed in appendix A to be addressed.

8.1 Gate three timing

Thames Water, Severn Trent Water and United Utilities have proposed a date for gate three of March 2025 with a proposed checkpoint in December 2023. This is proposed alongside a forward programme of gate four in October 2026, proposed planning application submitted in July 2026, solution construction ready in 2029, and solution operational in 2033.

We agree that River Severn to River Thames Transfer's gate three should be March 2025. This aligns gate three with solutions on a similar programme, and for RAPID to efficiently assess progress of activities, ahead of the solutions proposed planning application.

We have also decided that there may be a Conditional Review Point. After we have considered Thames Water's, Severn Trent Water's and United Utilities' submissions in response to the priority actions set out in Appendix A at the regular checkpoint in December 2023, we will confirm to Thames Water, Severn Trent Water and United Utilities whether there will be a Conditional Review Point and the date of the Conditional Review Point, if there is to be one. Any Conditional Review Point will be in addition to the regular checkpoints that the companies hold with us.

We agree with the forward programme for gate four.

The forward programme proposed by the solution is in line with the principles of RAPID's standard programme. Funding arrangements are set out in section 4.2 of this document.

Appendix A: Gate two actions and recommendations

Priority Actions – to be addressed by the dates specified		
Number	**Area**	**Detail**
1	Solution Design	Provide to RAPID a detailed plan for stakeholder and customer engagement (strategic and local). This plan should: • explain how customer and stakeholder views have informed and will inform key decisions; • demonstrate how relevant local, strategic and regulatory stakeholders are consulted including those in Wales eg Cadw/PEDW/Hafren Dyfyrdyw; • explore the gate two engagement feedback that 25% of stakeholders were negative towards water transfers, identifying any implications for the SRO progression; • clarify the extent to which results from WRW online consultation on transfers through Idea Stream platform influenced solution design; and • seek views from CCW and explain subsequent actions as a result of this engagement; • engage early with Historic England to discuss costs and benefits of canal option as well as wider heritage issues. This will be required by the regular checkpoint in December 2023.
2	Programme and Planning	Deliver the mitigations to reduce the uncertainty around the risks to the Severn Estuary Habitats Regulations site and its functionally linked habitat. These mitigations were proposed in the gate two submission and are composed of further modelling, monitoring and working closely with Minworth and STS solutions to ensure the results from the bench test treatment programmes indicate that the solution can deliver the required discharge quality. This action should be completed by the regular checkpoint in December 2023 on the understanding that any remaining uncertainty will be addressed by gate three through a pilot treatment plant.
3	Environment	Provide information by the regular checkpoint in December 2023 on the proposed advanced treatment processes at the Minworth and Netheridge Wastewater Treatment Workss, to fully understand the efficiency of the proposed treatment and the overall risk to the ecological features of the Severn Estuary Habitats Regulations site and associated tributaries.
4	Drinking Water Quality	Review and include the South East Water Drinking Water Safety Plan (DWSP) for River Thames abstractions in the Strategic Water Quality Risk Assessment (SWQRA) by the regular checkpoint in December 2023.
5	Drinking Water Quality	Provide evidence that all relevant Drinking Water Quality teams have been consulted about the scheme and their views taken into account. This should include those teams at the downstream water companies (including South East Water) as not all appear to have been included in the assessment so far. This action must be completed by the regular checkpoint in December 2023.

6	Solution Design	Confirm to RAPID that the solution aligns with Thames Water, United Utilities and Severn Trent Water's Water Resource Management Plans (WRMP) and relevant Regional Plans. This will be required by the regular checkpoint in December 2023.
7	Evidence of efficient spend	At the regular checkpoint meeting in December 2023, provide a report to RAPID on the expenditure incurred up to December 2023 and a revised forecast of expenditure to gate three.
Actions – to be addressed in standard gate three submission		
Number	**Area**	**Detail**
1	Solution Design	Provide further breakdown of utilisation by return periods to understand how the solution may be used in different events.
2	Solution Design	Provide further explanation of how the utilisation of the solution may change with interaction of South East Strategic Reservoir Option (SESRO), Thames to Affinity Transfer (T2AT) and Thames to Southern Transfer (T2ST) (as noted in the solution interactions section) .
3	Solution Design	Currently the solution's need has been presented on an earliest available basis, given uncertainties of the solution's selection ahead of final WRMPs. Provide clearer context of the solution's needs as currently selected, and a RAPID gate and construction ready programme that results from this.
4	Solution Design	Explain the conjunctive benefits with other solutions such as SESRO, T2AT and T2ST.
5	Solution Design	Confirm preferred volumes and configuration of the solution. Confirm to RAPID that the solution aligns with Thames Water, Severn Trent Water and United Utilities Water Resource Management Plans (WRMP) and relevant Regional Plans at the next available regular checkpoint meeting after the publication of the WRMPs and Regional Plans
6	Programme and Planning	Clearly explain how risk scores in table 7-5 in the main report of the gate two submission are calculated and defined.
Recommendations		
Number	**Area**	**Detail**
1	Solution Design	Prioritise and present work around selecting preferred pipeline pathways.
2	Solution Design	Provide information on any revised figures after the regional reconciliation is completed in regular checkpoint meetings with RAPID.
4	Costs and Benefits	Explain the solution benefits in more explicit detail. RAPID would welcome a deep dive session before the regular checkpoint in December 2023 to understand the best value metrics in more detail.

4	Costs and Benefits	Further define the water resource benefit at different return periods to understand the benefit the solution may bring under different events using modelling.
5	Programme and Planning	Explain how the risk table in the gate two submission varies from the quarterly risk reporting.
6	Drinking Water Quality	The Strategic Water Quality Risk Assessment (SWQRA) S3-354, considers pathogens to high risk. However, it was unclear whether the SWQRA considered if an increase in pathogen loading at treatment works would present a treatment challenge. For example, although crypto risk was high and remains high, explain whether increases in raw water loading require any additional treatment at some works, i.e. those treatment works without UV systems. Whilst there probably is not an increased loading as there is already significant effluent inputs into the River Thames, explain whether this been formally reviewed. Explain whether any increase in pathogen loading from the scheme would exceed current disinfection operational envelopes.
7	Drinking Water Quality	In respect to the Minworth reuse, confirm if by-products from the additional treatment have been considered e.g. chlorate, trihalomethanes.

Appendix B: Gate one actions and recommendations

Actions – addressed in standard gate two submission			
Number	**Area**	**Detail**	**RAPID assessment outcome**
1	Solution Design	Ensure Welsh stakeholders and customers are included in solution specific engagement	We do not consider that United Utilities, Severn Trent or Thames Water have provided sufficient evidence of progress in addressing this action. Whilst there was stakeholder engagement at a strategic level and this did include the Welsh Stakeholders, wider stakeholders and regulators such as Cadw and PEDW and local stakeholders were not engaged. An engagement plan must therefore be provided in gate three (see priority action 1).
2	Costs and Benefits	Further work is required on elements of the solution which impact on Wales ecosystem resilience. This will achieve sustainable management of natural resources as well as helping to achieve goals set out in the Wellbeing of Future Generations (Wales) Act 2015. Any proposal which has implications for Wales must meet the requirements of this Act and the Environment (Wales) Act 2016. This is in addition to the natural capital and biodiversity net gain requirements for England.	We consider that the companies have provided sufficient evidence of progress in addressing this action. The companies have undertaken work that looks at sustainable management of natural resources etc, however, we require more consideration of the broader socio-economic and cultural element rather than the environmental element of the legislative requirements for gate three.
3	Costs and Benefits	Present the outcomes of the resilience assessments of the solution in submission documents, with a focus on comparisons between the routing options. Investigate multi sector benefits the solution could provide. The solution also needs to consider the benefits to Wales as required under Welsh legislation	We consider that the companies have provided sufficient evidence of progress in addressing this action. Multi-sector benefits seemed to be restricted to tourism and recreation with little consideration to cultural benefits, social or economic benefits across the whole scheme (eg jobs, supply chains etc). A broader understanding of what is possible across social, economic, environmental and cultural (Wales opportunities/impacts) will be required at gate three, even if the evidence points to little benefit with respect to Wales.
4	Programme and Planning	Demonstrate full understanding of the risks to the solution from potential regulatory barriers, this includes risks and issues associated with the Habitats Regulations	We consider that the companies have provided sufficient evidence of progress in addressing this action. Considerable work has been carried out in gate two assessing the functionally linked habitat

			and pathways to the Severn Estuary Habitats Regulations site. This includes Water quality monitoring and modelling including Olfactory cues, hydraulic modelling and ecology monitoring. Uncertainty on the likely impact still remains and further work is planned in gate three.
5	Environment	Ensure environmental assessments comply with the Environment (Wales) Act 2016 and Well-being of Future Generations (Wales) Act 2015.	We consider Thames Water, Severn Trent Water and United Utilities to have met this gate one action regarding Welsh legislation, but there is further work required to engage Welsh stakeholders as per the legislative requirements and to demonstrate benefits to Wales, for gate three.
6	Environment	Investigate the impact of the solution on the integrity of the Severn Estuary Special Area of Conservation.	We consider Thames Water, Severn Trent Water and United Utilities to have provided sufficient evidence of progress in addressing this action.
7	Environment	Illustrate the relationship between carbon reduction, sector net zero commitments and solution design and delivery choices. Show methods used for carbon calculation, considering framework and national policy guidance.	We consider Thames Water, Severn Trent Water and United Utilities to have provided sufficient evidence of progress in addressing this action. The gate two carbon assessment met the guidance requirements.
Recommendations			
Number	**Area**	**Detail**	**RAPID assessment outcome**
1	Solution Design	Ensure relationships with receiving SROs in the south east are closely managed, and the communication of benefits to each solution are aligned (for example with SESRO).	We do not consider Thames Water, Severn Trent Water and United Utilities to have provided sufficient evidence of progress in addressing this recommendation. The companies should engage with drinking water quality teams at receiving water companies in the south east.
2	Solution Design	Develop a stakeholder engagement plan, including wider and local stakeholders, once decision on preferred route has been made.	We do not consider Thames Water, Severn Trent Water and United Utilities to have provided sufficient evidence of progress in addressing this recommendation. This is reflected in the priority action for a stakeholder engagement plan to be presented by regular checkpoint in December 2023.
3	Costs and Benefits	Further integrate social and amenity values into a costs & benefits assessment of the solution. Provide	We do not consider Thames Water, Severn Trent Water and United Utilities to have provided sufficient evidence of

		specifics on work being undertaken to adhere to Welsh legislation.	progress in addressing this recommendation. This is reflected in the priority action for a stakeholder engagement plan to be presented by regular checkpoint in December 2023.
4	Costs and Benefits	Further explore uncertainties in Deployable Output modelling following Water Resources South East modelling outputs and River Severn to River Thames transfer model build, including the solutions unsupported flow assumptions. We acknowledge this is being incorporated into gate two activities.	The companies have provided updates in their gate two submission which further advances their modelling work in line with the expectations of this recommendation. The companies acknowledge there is more to do in early gate three with expanded model builds and scenarios. We will engage through the regular checkpoints prior to gate three to keep up to date with the modelling programme.
5	Costs and Benefits	Investigate and present potential wider resilience benefits of the solution, beyond the resilience of the solution itself, even if these opportunities are limited by the solution type.	The STT solution team have provided updates in their gate two submission which further advances their investigations into wider benefits, with a particular focus on opportunities for ecosystem benefits. This is in line with our expectation for this recommendation. We will engage with the solution team through the regular checkpoints prior to gate three to keep up to date with wider benefit opportunities.

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

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