

June 2023

**Strategic regional water
resource solutions:
standard gate two final decision
for South East Strategic
Reservoir Option**

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1. Introduction

The purpose of this publication is to set out our final decision about whether the South East Strategic Reservoir Option (SESRO)¹ solution should continue to receive development funding². The solution owners Thames Water and Affinity Water submitted their standard gate two reports on 14 November 2022 for assessment. Further information concerning the background and context of the Thames Water and Affinity Water SESRO can be found in the SESRO publication document on the Affinity Water website³.

This publication should be read in conjunction with the final decision letter issued to each solution owner. Both this document and 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 and Affinity Water 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 “Abingdon reservoir”

² [PR19 final determinations: Strategic regional water resource solutions appendix](#)

³ [South East Strategic Reservoir](#)

2. Solution Summary

2.1 Solution summary

The South East Strategic Reservoir Option (SESRO) is a raw water storage option in the upper catchment of the River Thames. The SESRO project is being developed by Thames Water and Affinity Water with the aim of delivering a new reservoir to store water abstracted during periods of high flow in the River Thames for use during periods of low river flow or high demand for water.

Thames Water and Affinity Water have proposed that the reservoir could be used by the customers of multiple water companies across the South East of England. SESRO could provide a supply of water for Thames Water customers both locally and in London, Affinity Water customers in the Central Region via the Thames to Affinity Transfer and Southern Water customers, through integration with the Thames to Southern Transfer strategic resource option (SRO).

The solution partners have identified a chosen site for the reservoir, located south-west of Abingdon. The largest reservoir variant (150 Mm³) has a footprint that covers an area of just under 7 km².

Six variants of the SESRO scheme have been included in the Thames Water's 2024 Water Resource Management Plan (WRMP), consisting of different sizes and configurations. The constrained list of options included in the Water Resources South East (WRSE) regional plan includes:

- 150 cubic megametre (Mm³) capacity reservoir
- 125 Mm³ capacity reservoir
- 100 Mm³ capacity reservoir
- 75 Mm³ capacity reservoir
- 30+100 Mm³ capacity phased reservoir
- 80+42 Mm³ capacity phased reservoir

All six variants of SESRO have been developed as feasible options for the WRSE and WRMP options appraisal process, including an assessment of costs and environmental impact. For the gate two report, Thames Water and Affinity Water have focused the assessment of key issues and constraints for the largest (150 Mm³ storage) option. The solution owners considered that the 150 Mm³ option scheme contains the most constraints and issues to resolve, therefore provided a better 'starting point' for the gate two design process and for the development of the indicative gate two Master Plan.

The WRSE emerging regional plan, published by WRSE in January 2022, selected the 150 Mm³ SESRO to meet demand in the region by 2040. The draft regional plan, published by WRSE in

November 2022, selected the 100 Mm³ SESRO to meet demand in the region by 2040. The 100 Mm³ capacity reservoir is also proposed by both solution owners in their draft WRMP24. Assuming the 100 Mm³ option is retained in the final WRSE regional plan and WRMPs, the solution owners are proposing to continue the optimisation and design for SESRO during subsequent design phases.

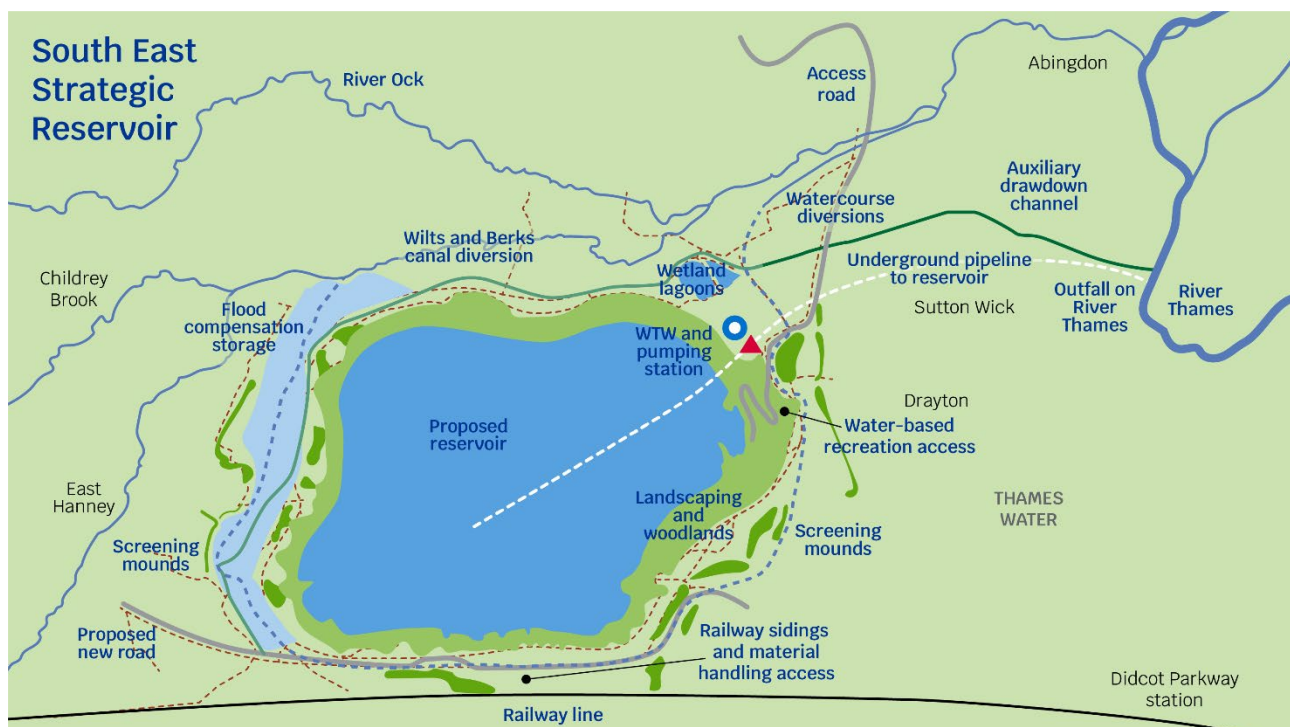
The single-phase reservoir options could deliver a dry year annual average of between 149 megalitres per day (ML/d) (75 Mm³ option) and 271 ML/d (150 Mm³ option). The 100 Mm³ option has a deployable output of 185 ML/d.

The construction of SESRO is not dependent on any other RAPID solution or other company options. However, for SESRO to deliver a benefit to customers, the water that is released into the River Thames would need to be re-abstracted, treated and distributed, which may require the provision of additional infrastructure. SESRO is therefore linked to other RAPID solutions which will need to be considered in the final scheme design.

The solutions in the RAPID gated programme that are linked to SESRO are:

- The Severn to Thames Transfer (STT)
- The Thames to Southern Transfer (T2ST)
- The Thames to Affinity Transfer (T2AT)

Figure 1. South East Strategic Reservoir Solution Schematic



3. Summary of representations

3.1 Representations received

We have received the following representations relevant to the South East Strategic Reservoir Option.

Table 1. Summary of representations

Representation from	Summary of representation
<p>Member of the public</p>	<p>Solution progression</p> <ul style="list-style-type: none"> • Agree that SESRO should be progressed to meet future water resource demand. <p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> • Would like to see recreational benefits fully explored.
<p>Wantage and Grove Campaign Group (WaGCG)</p>	<p>Solution costs</p> <ul style="list-style-type: none"> • 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 Regulated Capital Value (RCV) 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. <p>Interconnectedness</p> <ul style="list-style-type: none"> • 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. <p>Water resource planning</p> <ul style="list-style-type: none"> • WaGCG are concerned that the data used for population and climate change forecasts is inappropriate. • 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. STT has the maximum strategic, environmental and drought resilience impact.

	<p>Water quality</p> <ul style="list-style-type: none"> • WaGCG are concerned with the potential poor water quality in SESRO. <p>Best value planning</p> <ul style="list-style-type: none"> • WaGCG say that given that the recreational benefits of the reservoir seem to be such a large part of the justification for building a bunded reservoir, that without detail of how these will be introduced places doubt on the ability of the solution to deliver recreation, attracting development and increasing tourism potential in the local and wider area. <p>Environmental impact</p> <ul style="list-style-type: none"> • WaGCG believe that people most affected by the reservoir should be engaged on the landscape and visual impact assessment (LVIA) methodology. <p>Flood risk</p> <ul style="list-style-type: none"> • WaGCG raise concerns over flood risk in the area. There needs to be a comprehensive flood assessment before this proposal is taken forward.
<p>Steventon Parish Council (SPC)</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> • SPC believe that SESRO is not needed because the population forecast used to calculate water demand have overestimated population growth. • SPC believe the full picture of climate change effects and predictions should be considered. • SPC are concerned that the decision to develop solutions will be a political one rather than based on robust technical information. <p>Solution progression</p> <ul style="list-style-type: none"> • SPC suggest that the Severn to Thames Transfer will not be pursued should construction of SESRO go ahead despite the benefits. <p>Solution costs</p> <ul style="list-style-type: none"> • SPC are concerned that the disparity in funding and timing for STT and SESRO is unfair and that it demonstrates a preference for SESRO.
<p>Thames Water and Affinity Water</p>	<p>Solution costs</p> <ul style="list-style-type: none"> • Thames Water and Affinity Water note that the final total gate two expenditure is £6.01M, reduced from the £7.32M estimate. • Note that taking this amended underspend forward to gate three should enable an adjustment to the gate three allowance to £65.49M. • Note that the funding for AMP8 will be determined through the 2024 price review (PR24) process and that this is expected to include mechanisms for managing uncertainty across the SRO portfolio, and request that RAPID provide a response to confirm this principle.

	<p>WRMP commentary</p> <ul style="list-style-type: none"> Confirm that additional commentary will be provided in Thames Water and Affinity Water's respective draft WRMPs and associated Statements of Response to justify the choice of the SESRO option (100Mm³ or 150Mm³) required within the WRMP reported pathway. <p>Gate timing</p> <ul style="list-style-type: none"> Note that if a delay to the timing of gate three is required, this will be discussed and agreed with RAPID at the earliest possible opportunity. Note RAPID's suggestion that gate four should be November 2026 in order to be scheduled with a minimum of one month after the acceptance of planning applications. Intend to keep gate timings under review and to provide a more detailed forward programme to RAPID as part of their gate three submission. <p>Partner arrangements</p> <ul style="list-style-type: none"> Confirm that Southern Water will be joining as co-sponsor of the SESRO project from gate three onwards, and that partner arrangements will be finalised and implemented as part of their respective PR24 submissions. <p>Actions and recommendations</p> <ul style="list-style-type: none"> Confirm that the solution teams will continue to provide regular updates on their responses to the gate two actions and recommendations, and on their other gate three technical workstreams.
<p>Vale of White Horse District Council and South Oxfordshire District Council</p>	<p>Solution progression</p> <ul style="list-style-type: none"> The Council are concerned that SESRO is progressing to gate three. Suggest that all the schemes assessed at gate two are progressing to gate three and that RAPID have not produced a 'shortlist' of solutions. The Council note opposition to the progression of SESRO to gate three due to the carbon emissions of the reservoir and public opposition to the scheme. Suggest instead that a series of smaller, catchment or nature-based options could be investigated ahead of a large reservoir. The Council note a preference that a wider range of nature-based catchment management schemes are developed rather than large strategic schemes. Note that nature-based catchment management schemes could enable more water to be retained 'in the system', help manage flood risks, and create new nature reserves. Note that nature-based catchment management schemes could benefit people and nature, and that such schemes can most effectively be progressed with local authorities.

	<ul style="list-style-type: none"> Note that such schemes would require less public money, would have smaller carbon emissions, would have less of a damaging impact on the environment and landscape, and would be less likely to have opposition from local communities. <p>Gate timing</p> <ul style="list-style-type: none"> The Council note concern that there are no end dates shown for gates three and four. Note concern that the process and timing for the RAPID gates appear to have changed since the process was first developed. <p>Carbon costs</p> <ul style="list-style-type: none"> The Council note concern with the carbon emissions of large reservoir projects. Note concern that SESRO will prevent net zero targets from being met. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> Note the involvement of bodies such as Historic England, Natural England and the Environment Agency with the RAPID schemes, however, suggest that local councils are better placed to identify issues and suggest mitigation measures for the schemes with respect to the impact on people, the environment and the locations the schemes are developed. The Council note that SESRO is a Nationally Significant Infrastructure Project (NSIP), however suggest that RAPID includes a recommendation at gate two for solution partners to act on advice from the local planning authority and the highways authority on scheme development.
<p>Vale of White Horse District Council</p>	<p>Solution progression</p> <ul style="list-style-type: none"> Question why a smaller reservoir (100Mm³) is being progressed with the funding allowance for a 150Mm³ reservoir. The Council is concerned that the scheme is progressing to gate three without RAPID having received the relevant information on construction and procurement. <p>Environmental impact</p> <ul style="list-style-type: none"> The Council note that Thames Water are advised to agree the Landscape and Visual Impact Assessment (LVIA) methodology with Natural England. The Council suggest that their landscape officers should be offered the opportunity to input into the scoping and methodology of the LVIA. <p>Flood risk</p> <ul style="list-style-type: none"> The Council suggests that they should be involved with discussions on flood risk and alleviation, noting that the Vale of White Horse Local Plan 2031 includes safeguarding for land on the reservoir site to provide a flood alleviation scheme, and this was part of previous proposals for the reservoir.

	<ul style="list-style-type: none"> • Recommend that RAPID instruct Thames Water to include the recently identified opportunity for a flood alleviation defence for Abingdon in the solution design. • Note that there are opportunities for SESRO to reduce flood risk for local residents and note the importance of developing these opportunities. <p>Construction impacts</p> <ul style="list-style-type: none"> • The Council note that there would be significant impacts from construction on the area around the preferred site. • Recommend that RAPID encourage the solution partners to engage with the Local Planning Authority to address issues relating to construction. • Request that greater use is made of rail freight to reduce road congestion and to reduce the impact on air quality. • Note the need to consider where non-car modes of transport can be used during the construction of SESRO and request that the new 'decide and provide' transport planning approach be used by the solution partners. • Welcome the solution partners' plan to investigate ways to reduce the use of cars as a means of transport to access SESRO. • Request that solution partners provide clarification on the reference to 'accommodation' in the gate two submission to confirm whether this is for working day needs of employees or overnight accommodation, and the extent of accommodation and adjunct facilities required. <p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> • Note the opportunity for the co-design of schemes with SESRO that could benefit the local community. • Note strong support for the reopening of a railway station to support the population of Wantage and Grove. • Note that the railway sidings provided for the reservoir present an opportunity to deliver the station and suggest that RAPID encourage the solution partners and Network Rail to locate the new sidings closer to Wantage and Grove. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • Customer and stakeholder engagement is a key consideration and note there is little comment in RAPID's decision on negative stakeholder feedback. • Note that RAPID recorded that 25% of feedback from stakeholders was negative in Severn Thames Transfer decision, but this was not recorded for SESRO. Suggest that the lack of negative responses to SESRO are due to only a small number of consultees living close to the proposed site. • Note that there is significant opposition to SESRO and believe that RAPID should do more to challenge the solution partners to demonstrate the benefits that could be realised from the scheme.
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	<ul style="list-style-type: none"> Note disappointment that customer preferences on added value for large resource schemes were determined using a study that looked at a cross section of Thames Water customers rather than customers living close to the proposed site location. The Council note that the additional benefits to be developed with SESRO should be informed by consultation with those living closest to the reservoir, not those living long distances from the proposed development. Believe that RAPID should make this clear in their final decision.
<p>South Oxfordshire District Council</p>	<p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> The Council note that the proposals for SESRO are not providing appropriate mitigation for local communities. Suggest that SESRO should include more opportunities for sport, leisure and recreation, green infrastructure, transport improvements and increased flood resilience to assist the area impacted by the reservoir, including Didcot Garden Town. Note that the scheme of benefits provided by SESRO should be informed by those living close to the proposed reservoir site.
<p>Oxfordshire County Council</p>	<p>Stakeholder engagement</p> <ul style="list-style-type: none"> The Council note that the RAPID schemes should be informed by consultation with people that live close to where the schemes are constructed, and that RAPID should highlight in its decisions the importance of working with local councils and communities. Note the opposition to SESRO from stakeholders. Note that Oxfordshire County Council and the Vale of White Horse District Council should be involved in providing pre-application advice should the SRO proceed. <p>Decision making</p> <ul style="list-style-type: none"> 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. <p>Gate timing</p> <ul style="list-style-type: none"> RAPID's draft decisions offer various gate three dates going forward. 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. <p>Chalk streams</p> <ul style="list-style-type: none"> The Council suggest that the progression of SESRO has been pursued as 'an illusory perfection for chalk streams' while action on sewage pollution in the rest of the Upper Thames is delayed.

	<p>Water resource planning</p> <ul style="list-style-type: none"> • 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. • There are other options which could provide water supply which are not included in the RAPID gated process. 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. • 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. <p>Carbon costs</p> <ul style="list-style-type: none"> • 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. • 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. • Believe that RAPID should compare each of the draft decisions to consistently seek evidence about carbon costs. • 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. • Note that low energy demand from the solutions once in use will not be an effective mitigation for high energy use in construction.
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	<p>Solution progression</p> <ul style="list-style-type: none"> • The Council suggest that SESRO is not needed and believe that the SRO should not progress. • Suggest that the areas of the South East that SESRO is designed to transfers water to could be served by other options. <p>Solution design</p> <ul style="list-style-type: none"> • The Council believe that the proposed 100Mm3 and 150Mm3 options for the reservoir design is too large and would cover too much land close to populated areas. • Suggest that the reservoir would not be an effective water resource due to not being able to be filled during periods of prolonged drought. • The Council question why RAPID have suggested that the 150Mm3 reservoir should also be investigated due to the higher environmental impacts of this option size, and instead recommend that RAPID should give more support to working up options smaller than 100 Mm3. • The Council suggest that the 10 year construction time of SESRO could prevent smaller and more resilient schemes being developed. <p>Solution costs</p> <ul style="list-style-type: none"> • The Council suggest that the cost to construct SESRO is disproportionately high when compared to other options. • The Council suggest that the operation costs for pumping water and maintaining facilities will be high. <p>Environmental impact</p> <ul style="list-style-type: none"> • The Council suggest that obtaining a Development Consent Order may be difficult due to the adverse environmental effects of SESRO's development. <p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> • The Council suggest that RAPID should direct the solution partners to note the additional environmental and recreational benefits that could be developed from SESRO. <p>Actions and recommendations</p> <ul style="list-style-type: none"> • The Council suggest that the actions and recommendations identified by RAPID at gate two are 'light' in comparison to the actions and recommendations set for other RAPID SROs.
<p>East Hendred Parish Council</p>	<p>Water resources planning</p> <ul style="list-style-type: none"> • East Hendred Parish Council believe there is insufficient robust evidence for the population projections for 2025–35, or 2050. <p>Environmental impact</p> <ul style="list-style-type: none"> • East Hendred Parish Council comment that the scale of the reservoir is massive. Its shape is an alien & incongruous feature in the countryside. Its setting is untypical of that of

	<p>other rural reservoirs. Its adverse impact on highly sensitive long distance views.</p> <p>Solution design</p> <ul style="list-style-type: none"> • Feasibility and safety. Large reservoirs close to urban areas, as at SERSO create a risk to life, not associated with transfer schemes. <p>Environmental reporting</p> <ul style="list-style-type: none"> • The absence of an Environmental Impact Assessment until 2026. <p>Climate change</p> <ul style="list-style-type: none"> • The cumulative impact on climate change. Members of Oxfordshire County Council, The Vale of White Horse & South Oxfordshire District Councils, are quoted in the Guardian article (Appendix 1) as saying that the reservoir will prevent their Councils from meeting their Climate Change targets for 15 years. <p>Best value planning</p> <ul style="list-style-type: none"> • The proposed reservoir, SESRO, has not been demonstrated to be the best option, when compared to the Severn to Thames Transfer. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • Thames Water has not engaged with stakeholders, County, District, Parish, MPs. <p>Decision making</p> <ul style="list-style-type: none"> • The National Infrastructure Commission report on Dry Rivers advocates a national water network, through transfers.
<p>Wantage Town Council</p>	<p>Stakeholder engagement</p> <ul style="list-style-type: none"> • 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. <p>Solution costs</p> <ul style="list-style-type: none"> • Wantage Town Council are concerned that the submission documents are not transparent about the impact of solution development on customer bills. <p>Water resource planning</p> <ul style="list-style-type: none"> • 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

	<p>suggests that the regulator explicitly mandates such accessibility in its decision-making process.</p> <p>Best value planning</p> <ul style="list-style-type: none"> 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. <p>Environmental impact</p> <ul style="list-style-type: none"> 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 our environment and prevent the release of raw sewage into our waterways. <p>Document consistency</p> <ul style="list-style-type: none"> Wantage Town Council highlight there is inconsistent wording in Figure 3 across SESRO, STT and T2ST decision documents.
<p>Group Against Reservoir Development (GARD)</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> GARD asserts 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. Building infrastructure is insurance against failure to meet these targets. Suggested that this "insurance" should be in the region of 100-200MI/d. Overestimation of supply demand deficit is largely due to abstraction reductions which GARD argue are not economically or environmentally justified. Propose that some reductions in sensitive chalk streams should be brought forward to the early 2030s. Propose no decisions should be taken on the need and choice of new resource schemes until prioritisation of abstraction reductions has been completed. Inappropriate use of climate change projections to calculate supply-demand balance. Propose that it would be reasonably cautious to assume the 'Medium' scenario as the central planning assumption. Inadequacy of Thames Water's and Affinity Water's plans for PCC reduction. Thames Water leakage reduction targets falling short. <p>Solution progression</p> <ul style="list-style-type: none"> Ofwat have assessed the quality of the gate two report as 'Good' in every aspect, but they consider it to be 'Poor' in each of the assessment categories. <p>Solution design</p> <ul style="list-style-type: none"> Gate two concept design report contains minimal information on the design of the embankment and there is

	<p>no evidence that the crucial geotechnical design has been addressed in any meaningful detail.</p> <ul style="list-style-type: none"> • The proposed Abingdon reservoir still only allows 6% of emergency storage, as compared to typically 20% for other major UK reservoirs. The last 6% of water will probably be of very poor water quality and is likely to be unusable. • GARD believes the 1m height of the embankment crest above maximum water level is too low. They believe that Thames Water and its partners need to publish the freeboard calculations, and that this should be assessed by experts at gate three. • The Concept Design report makes no reference to plans for a trial embankment before finalising the design and start of construction. This is normally standard practice for embankment dams. For example, even for the much smaller planned Havant Thicket reservoir, Portsmouth Water is currently building and testing a trial embankment. This should be progressed in gate three. • Propose that a full dam break analysis and associated flood map should be undertaken before progression of the reservoir SRO to gate three. They believe that: <ol style="list-style-type: none"> 1) given the 25-year history of the Abingdon Reservoir proposal, the risks of a major dam breach should have been analysed long ago and presented for expert assessment. 2) the production and assessment of the dam break risk should be evaluated by RAPID, using independent experts, in a transparent way, before there is any progression of the Reservoir SRO to gate three, via an interim checkpoint. 3) full assessment of the Flood Map to be made at an interim checkpoint before the reservoir is allowed to pass through to RAPID gate three. • Propose that expert evaluation of terrorist threat to the reservoir should be made before progression to gate three. GARD believes that an expert evaluation of the issues of terrorist threat to the reservoir should be made at gate three, and that this should be shared with people at an appropriate level of security clearance/ responsibility. This cohort should certainly include local officials and elected representatives. • Gate two report refers to assessments of fluvial flooding using Environment Agency models, there are few details. They call for the data collection to inform this modelling to be put in place at the earliest opportunity and for a full examination of the validated modelling to occur before the reservoir is allowed to proceed to gate three. • In GARD's view, the Abingdon Reservoir project should not proceed to gate three without an interim expert examination of flood modelling validated by acquired data.
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	<ul style="list-style-type: none"> • GARD calls for the groundwater data collection to inform this modelling to be put in place at the earliest opportunity and for a full examination of the validated modelling to occur before the Abingdon Reservoir is allowed to proceed to gate three. • Recommend that Ofwat calls for detailed geotechnical investigation to be undertaken as part of the gate three activities and before any decision is taken to proceed to gate four. • Recommend that Ofwat should call for detailed construction planning to be undertaken for gate three, including design layouts of all construction facilities and temporary works. • GARD assert that there is no serious estimate of the time taken to fill the reservoir after completion of construction. What little detail there is contains a major error through using a Culham minimum required flow of 450MI/d instead of 1450MI/d. The absence of probabilistic estimates of times needed for initial filling of the reservoir is a major weakness in the gate two reporting. <p>Solution costs</p> <ul style="list-style-type: none"> • Lack of transparency in cost information presented. • 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. This is a major failing in transparency which needs to be addressed in gate three. • Error in calculation (analysis shows that the Net Present Costs (NPC) cost of the 100Mm³ reservoir should be £1,571m, which is £270m higher than Thames water’s estimate of £1,301m). • no calculation of the true total costs of the reservoir to customers arising from linking customer bills to the Regulated Asset Base of the supplying companies. <p>Carbon costs</p> <ul style="list-style-type: none"> • GARD conclude that the low-carbon earthmoving equipment is highly unlikely to be available for building the embankment and an alternative ‘low-carbon’ construction phase for the reservoir is unrealistic. • GARD conclude that the carbon sequestration ‘opportunities’ are limited and uncertain, and not larger than local initiatives (funded by new DEFRA rules and Local Authorities) could achieve without the reservoir at vastly lower cost. • Evidence that greenhouse gas emissions are substantial from large reservoirs. These emissions potentially dwarf the rather low Operating Carbon figure for the Reservoir. These
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	<p>issues are completely absent from the RAPID gate two reports and must be evaluated for gate three.</p> <ul style="list-style-type: none"> • Around 40 MW of solar farm generating capacity is lost by construction of the reservoir. The gate two reports make it clear that there is no intention to re-site these on the post construction site and a floating solar farm is now ruled out by Thames Water. <p>Environmental reporting</p> <ul style="list-style-type: none"> • Environmental reporting for the reservoir is extremely poor, being superficial, lacking in evidence and biased to exaggerate the benefits of the reservoir and downplay its negative impacts. • Natural Capital Assessment gives an over-optimistic portrayal with ‘brochure culture’ taking over. • The Biodiversity Net Gain assessment for the reservoir suffers from many aspirational and unfounded assertions of habitat creation with many inconsistencies and errors. • Gate two environmental reporting contains nothing new on the very serious issues of noise, air pollution and traffic impacts, over and above what was in the roundly-criticised gate one document. These are all major impacts on the local area, especially for the villages in close proximity to the reservoir site. Ofwat’s gate two decision report should require these aspects to be addressed in detail in gate three, in consultation with local authorities. • In their view, the strategic environmental assessments (SEA) has only improved by the findings of the newer methods of natural capital assessments (NCA) and biological net gain (BNG) analysis. This is to be welcomed, although they still see enough evidence of ‘company spin’ creeping in. GARD believes that RAPID should insist on a more transparent demonstration of the thinking behind the SEA markings, and needs to mount a much stronger challenge. • That there are simply no guidelines on the calculation of the NCA Metric for ‘Recreation and Amenity value’, and this has allowed Thames Water and its partners to claim very large monetised benefit (sufficient to outweigh all the negative NCA metrics) with no transparent justification and not even the limited discussion and presentation given for the other NCA metrics (such as Food Production, Natural Hazard Regulation, Air Pollutant Removal, Water Purification etc). <p>Water quality</p> <ul style="list-style-type: none"> • Potential water quality issues during drought not taken into account in water quality assessments. • Gate two actions appear to refer to general issues of water quality in the reservoir and they do not address the specific issue of water quality in the “dregs” of the reservoir at the end of an extreme drought, when the depth of water in the lake will be less than the 5m depth that Thames Water
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	<p>themselves say is the minimum needed for adequate water quality.</p> <ul style="list-style-type: none"> • Comment around minimal attention given to water quality issues for SESRO compared to risk-averse approach taken for STT. <p>Board statement and assurance</p> <ul style="list-style-type: none"> • GARD raise potential conflict of interest issue because company contracted to do assurance have also worked on other water resource planning projects. <p>Recommendations for gate three activities</p> <ul style="list-style-type: none"> • GARD think that Ofwat’s recommendations for gate three actions should specifically cover the deficiencies in the gate two reports. These cover: <ol style="list-style-type: none"> 1. Geotechnical design of the dam and associated site investigations. 2. Provisions for dead and emergency storage and the acceptability of water quality in the reservoir at times of extreme drought and near-emergency drawdown. 3. An independent assessment of freeboard provision. 4. Dam break analysis and publication of maps of potential areas flooded. 5. Expert analysis of terrorism threat and need to limit access. 6. Surface and groundwater flooding impact of the reservoir. 7. Independent expert review of the stochastic data and Pywr modelling used to determine Abingdon reservoir and drought resilience. 8. Reassessment of the Natural Capital, Biological Net Gain and Strategic Environment Assessments. 9. Construction planning to a sufficient level of detail to allow preparation of plans for layout of temporary facilities and permanent works at the reservoir site. 10. Probabilistic assessment of time to fill the reservoir after completion of construction, based on historic flow records, not the unreliable stochastic data. • 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: <ol style="list-style-type: none"> 1. The Deerhurst and Culham minimum required flows. 2. The 25 MI/d limitation on the amount of regulation releases discharged to the River Vyrnwy. 3. The need for treatment of effluent from Netheridge and Minworth Sewage Treatment Works (STWs). 4. The need for treatment of STT water at Deerhurst before transfer through the aqueduct.
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	<p>5. The acceptability of discharging water from Abingdon reservoir into the River Thames without treatment, when reservoir storage is less than 15% in droughts.</p> <p>6. The restriction of the Teddington DRA scheme to a maximum 100 Ml/d discharge of Mogden STW effluent.</p> <ul style="list-style-type: none"> • They propose 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. <p>Independent expert review</p> <ul style="list-style-type: none"> • A number of these gate three activities should be independent expert assessments of Thames Water and Affinity Water’s work. If this is left to the water companies to arrange, they think the assessments will be biased by conflicts of interest. They propose that, even if this work is funded by the water companies, Ofwat should share responsibility for selection and appointment of the experts. • The experts’ reports should be made directly to Ofwat, not to the water companies. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • There has been no serious interaction with the relevant local organisations to understand concerns, and it is certainly not clear that the proposed overnight ban on site clearance and construction noise activities has been taken onboard in the planning of the Reservoir project (see section 3.4). • Ofwat’s gate two decision report should require these aspects to be addressed in detail in gate three, in consultation with local authorities. <p>Deployable output and drought resilience</p> <ul style="list-style-type: none"> • GARD believe the stochastic river flow data and Pywr modelling are not fit for the purpose of assessing the deployable output and drought resilience of Abingdon reservoir (SESRO). • Stochastic data excludes long droughts and Thames Water haven’t considered artificial weather series to account for prolonged droughts. • Long duration droughts are likely to reduce Deployable Output of SESRO as shown by some of GARD’s modelling.
<p>Local Councillor</p>	<p>Solution progression</p> <ul style="list-style-type: none"> • Suggest that the 'interconnectedness' of the RAPID SROs has not been considered at gate two. • Oppose the progression of SESRO to gate three. • Suggest that SESRO could be constructed and then be found to be unnecessary with high monetary and carbon costs incurred for little gain. • Suggest that water transfers that could be operational before SESRO should be progressed instead of the reservoir.

	<ul style="list-style-type: none"> Note that the Severn to Thames Transfer could provide water resource before SESRO could and would involve less disruption and have less of an environmental impact. Suggest that the Severn to Thames Transfer could be delivered quickly to enable faster delivery of abstraction reduction. <p>Water resource planning</p> <ul style="list-style-type: none"> Suggest that the population forecasts used to estimate future demand are out of date. Suggest that the RAPID process will not help the industry meet abstraction reduction targets. Question why leakage reduction of 14% was allowed for Oxfordshire rather than the national target of 50%. Suggest that SESRO will not be an effective source of water during droughts in the most severe climate change scenarios. <p>Risks</p> <ul style="list-style-type: none"> Note the considerable risk of large infrastructure projects being over budget and not delivered on schedule. Suggest that work should have been undertaken to consider the microclimate effects of a large and raised body of water that is inland and near to a major arterial road route, such as such as evaporation fogs and radiative fogs coupled with katabatic winds. <p>Flood risk</p> <ul style="list-style-type: none"> Suggest that the flood risk modelling and assessments should be at a more advanced stage at gate two than they currently are. <p>Social impact/ Wider benefits</p> <ul style="list-style-type: none"> Suggest that the development of potential recreational benefits of SESRO could be prevented by risks from invasive non-native species.
<p>Local Member of Parliament</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> Note the need for the water industry to take action to address the increasing gap between water supply and demand. Note concern that Thames Water's WRMP prioritise the development of SESRO over other schemes that could be more cost-effective and have a smaller environmental impact, as well as deprioritising leakage reduction. <p>Construction time</p> <ul style="list-style-type: none"> Note that the reservoir will be built no earlier than 2040 and will be built in a single stage therefore it will not be possible for a smaller reservoir to be built should future demand for water be less than predicted.

	<p>Water resource planning</p> <ul style="list-style-type: none"> • Suggest that the Severn to Thames Transfer is a preferable option to SESRO as it brings a 'new' source of water into the region. <p>Deployable output and drought resilience</p> <ul style="list-style-type: none"> • Suggest that SESRO will not be resilient to multi-year droughts and that there will not be water available to fill the reservoir during multi-year droughts. <p>Flood risk</p> <ul style="list-style-type: none"> • Note concern that SESRO would be built on a flood plain which would aggravate flooding downstream of the reservoir site, particularly in Abingdon. • Note concern with the risks of flooding respective to the size of the proposed reservoir for SESRO. • Note that the reservoirs above 75Mm3 were deemed to be a flood risk in Thames Water's WRMP19 submission, and that Thames Water have not provided updated modelling to disprove this. • Note concern that there may be an insufficient area of flood storage on the reservoir site to compensate for the loss of floodplain. • Recommends that RAPID does not progress SESRO to gate three unless flooding risks and safety issues relating to the reservoir are presented to the public. <p>Carbon costs</p> <ul style="list-style-type: none"> • Note concern that there will be a high amount of embedded carbon in the reservoir. <p>Water resource planning</p> <ul style="list-style-type: none"> • Suggest that the water saved from fixing existing infrastructure in Thames Water's area will negate the need for SESRO to be built, and that this should be prioritised over building SESRO.
<p>CPRE Oxfordshire</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> • Many 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. <p>Chalk streams</p> <ul style="list-style-type: none"> • CPRE Oxfordshire supports the restoration of our internationally unique chalk streams and some reduction in groundwater extraction is needed. They would urge, as a matter of urgency, that work to investigate the best and most cost-effective strategies to restore our chalk streams is expanded. The current plans focus wholly on water extraction but pollution (sewage and agricultural) is a bigger factor for the lower reaches of the rivers.

	<p>Climate change</p> <ul style="list-style-type: none"> • CPRE Oxfordshire contends that it is perverse that the headline demand scenario used by WRSE is within 5% of the very highest of the nine scenarios presented. CPRE Oxfordshire ask for a more honest assessment of the uncertainties in the demand forecasts and the target scenario closer to the average. <p>Water quality</p> <ul style="list-style-type: none"> • Note that SESRO will be a raw water storage option and note concern that there is a risk that local communities will be living in close proximity to untreated, algae contaminated water. <p>Environmental impact</p> <ul style="list-style-type: none"> • The actions to be addressed in the gate three submission refer only to reviewing and updating the landscape and visual impact assessment (LVIA) methodology with Natural England not with the people most affected by the reservoir. <p>Flood risk</p> <ul style="list-style-type: none"> • There needs to be a comprehensive flood assessment before this proposal is taken forward. <p>Social impacts/ wider benefits</p> <ul style="list-style-type: none"> • Given that the recreational benefits of the reservoir seem to be such a large part of the justification for building a bunded reservoir, it seems that to get past gate two without any detail of how these will be introduced places significant doubt on the ability of the SESRO to deliver recreation, attracting development and increasing tourism potential in the local and wider area.
<p>On Behalf of Garford Village Meeting</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> • Believe that the population forecast used to calculate water demand have overestimated population growth to justify building SESRO. • Suggest that Thames Water have a poor record on leakage reduction and that their target for reduction of water consumption is below the national average target. <p>Social impact/ Wider benefits</p> <ul style="list-style-type: none"> • State that no details have been provided by Thames Water on the impact of the reservoir on local communities. • Question the social benefits that could be provided by the reservoir as unrestricted access to a bunded reservoir poses a security risk. • Note that opportunities for leisure activities will be limited should SESRO be covered with solar panels. <p>Environmental impact</p> <ul style="list-style-type: none"> • State that no details have been provided by Thames Water on the impact of the reservoir on the landscape, wildlife, sustainability and flooding.

	<p>Best value planning</p> <ul style="list-style-type: none"> • Believe that evidence has not been provided to show that SESRO is adaptable. • Note the risk that once construction starts on a reservoir it cannot be undone. • Note that the chosen location for the reservoir (the Lowland Vale) is an area that is prone to drought, therefore question whether SESRO will be fit for purpose. • Suggest that more consideration should be given to options for water transfers as these could be introduced at an earlier date and could be adapted to meet demand requirements. <p>Flood risk</p> <ul style="list-style-type: none"> • Note that the reservoir site is located on a flood plain and suggest that the gate two submission does not account for management of flood risk and does not show a large enough flood storage area. • Note that communities close to the reservoir site have experienced flooding and flash flooding in recent years, and that removing the flood plain will make flooding worse. • Note the need for impact analysis to be carried out and for this to consider the cumulative effects on flooding of SESRO and other new developments being built in the area. <p>Solution costs</p> <ul style="list-style-type: none"> • Suggest that SESRO will generate profits for shareholders and that this is being prioritised above reducing leakage, improving existing infrastructure and reducing consumer demand. <p>Water quality</p> <ul style="list-style-type: none"> • Note that SESRO will be a raw water storage option and note concern that there is a risk that local communities will be living in close proximity to untreated, algae contaminated water.
<p>Historic England</p>	<p>Historic environment</p> <ul style="list-style-type: none"> • Note that some engagement with Historic England has taken place, however further engagement is recommended to be undertaken with Historic England and with other heritage stakeholders.

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 Solution costs

Water resources infrastructure options are considered and selected as part of regional plans and water resource management plans not the gated process. The gated process provides cost information for other purposes.

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.

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 engaged with Thames Water on this issue, and we are satisfied with their response to GARD, as well as their provision of a worked example to GARD on their financing costs for the SESRO 100Mm³ option, in the context of similar comments made by GARD on Thames Water's draft WRMP. We note that an extended deadline was given to GARD so that they would have adequate time to respond to the Thames Water draft WRMP.

GARD have raised several issues with Thames Water's calculations. We have engaged with Thames Water to resolve these issues. Having engaged with Thames Water, we are satisfied with their calculations and do not believe that the comments made by GARD have a material effect on the NPC figures for SESRO, as presented at gate two.

Most of the differences appear to be due to disagreement in the exact methodology used to derive the indicative NPC values used in the gate two report. We note that the NPC values in the gate two report will be immaterial to the choice of options within the WRMP.

Finally, due to the degree of detail that has been put into cost estimates, as well as constant review of these cost estimates, Thames Water do not believe that costs will escalate significantly beyond the current estimate. Costs will continue to be reviewed and refined for RAPID gate three and RAPID will monitor these through regular checkpoint meetings.

Water companies are tasked with reducing leakage, improving existing infrastructure and reducing consumer demand. However, water resource management planning indicates that just reducing leakage and consumer demand will not be sufficient alone to meet projected

demand and additional infrastructure solutions will be needed to meet this demand. It is likely that a mixture of solutions is needed to meet future water needs, as opposed to simply just reducing leakage or consumer demand.

The closest comparators to SESRO in the RAPID Gated Process are Fens Reservoir and South Lincolnshire Reservoir. We do not believe that the cost to construct SESRO is disproportionately high compared to these solutions. At gate two, total capex for SESRO was £1.88 billion, while that of Fens Reservoir and South Lincolnshire Reservoir was £1.96 billion and £2.33 billion respectively.

We have not identified any material differences between operation costs for SESRO and any other solutions to suggest that SESRO's operation costs are likely to be relatively high.

Following final gate two expenditure information provided in Thames Water and Affinity Water's representation we have adjusted values in section 4.3.

3.2.2 Interconnectedness

RAPID took a decision at gate one to continue to develop solutions separately rather than collectively. It is recognised that, as water resources planning and the gated process advances, solutions may provide resilience benefits to their own regions, to other solutions, or to other regions beyond those served by individual solutions.

Whilst assessing these solutions individually through the gated process, RAPID does also review them as a 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, as well as at the individual solutions.

3.2.3 Water resource planning

The water resources planning process assesses the need for these solutions and the socioeconomic assumptions such as those around growth underpinning the modelling for these processes.

Company WRMPs and Regional Plans develop their demand forecasts in line with Water Resource Planning Guidelines, which sets out requirements for using Local Plan and Office for National Statistics population growth projections. Ofwat's long term delivery strategies guidance also defines using two population forecasts in low and high population scenarios. We have assessed where companies have adhered to these methods in order to set out the needs case for the RAPID solutions.

Through WRSE's draft regional plan consultation, Ofwat have fed back that WRSE companies have tested more extreme scenarios for climate change and demand and combined these

scenarios, which is driving requirements for investment. WRSE must demonstrate in its final plan that its proposals are low-regret and plausible scenarios have been used to optimise the selection and timing of key enhancements. RAPID will assess how this impacts timing and selection of solutions in its programme.

Ofwat have fed back to companies draft water resource management plan consultations where it has been clear they have not been ambitious enough in meeting PCC and other demand management targets. We expect to see company responses in their statement of responses, and final water resource management plans. RAPID will assess any impact this has on timing and selection of solutions in its programme.

Reducing leakage and being more efficient in using water both have a significant role to play but 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.

The anticipated effects from industry measures to reduce leakage and reduce demand are taken into account in water resource planning as part of the assessment of whether new water resource infrastructure is required. 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. The conclusion of the water resource management planning process is that, even with these reductions, new water resource infrastructure will be needed to improve drought resilience, reduce the impact of abstraction on the environment, supply a growing population and adapt to climate impacts.

The draft Water Resource Management Plans (WRMPs) 2024 set out a much broader range of supply and demand options which maintain resilience in the companies' supply-demand balance over the entire planning horizon (at least 25 years), including in the short term such as over the 2025–2030 period, and longer term, such as the inclusion of the RAPID strategic solutions. The forecast supply-demand balance in the WRMPs includes allowances for climate change across the entire planning horizon, including short term and long term, in line with the water resources planning guideline supplementary guidance on climate change. The plans also incorporate adaptive planning, which test several plausible extremes for climate change, to ensure the plans can adapt to different scenarios if they come to fruition, including longer duration extreme multi-year events.

The RAPID programme is one of several approaches the sector is working with to ensure short-term and long-term resilience in the sector.

Ofwat have allocated up to £469 million for companies to investigate and develop integrated strategic regional water resource solutions during 2020–25. This enable companies to develop solutions on behalf of customers that are ‘construction ready’ for the 2025–2030 period, and that protect and enhance the environment and benefit wider society. This intervention further demonstrates our commitment to supporting long-term resilience and innovation.

The RAPID programme does, and 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. There are also solutions in the RAPID programme that use existing or refurbished infrastructure, such as Grand Union Canal and North West Transfer. There are also several solutions that are considering the use of pipelines to transfer water such as Anglian to Affinity Water.

In terms of non-capital options, Ofwat are encouraging nature-based solutions through PR24 as referred to in PR24 final methodology Appendix 9 Setting Expenditure Allowances.⁴

3.2.4 Carbon costs

Solution development to gate three should continue to build from the gate two submissions. In particular, in our gate three guidance, we are asking solutions to continue to follow the Water Resources Planning Guidelines for WRMP24 section 8.3.2 (published on 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 paper⁵. 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 Hierarchy⁶ ; and

⁴ [PR24 final methodology Appendix 9 Setting Expenditure Allowances](#)

⁵ [Net-zero-principles-position-paper](#)

⁶ The GHG Management Hierarchy, as detailed by the Institute of Environmental Management and Assessment (2020 version), is a framework organisations can use to guide the scoping and strategic planning of their energy and carbon management activities.

- clearly address both operation and embedded emissions

With regard to GARD's concerns about possible loss of the solar farm, we agree that Table 6.8 of the main SESRO gate two report says "the construction of SESRO could require removal of solar farms that are currently located at the site." However, it also says "there may be an opportunity for the panels to be moved to a new location. The remaining design life of the solar panels would need to be taken into consideration." Table 4.2 includes "Renewable energy generation: Implementation of renewable energy generation into SESRO site (particularly floating solar photovoltaic cells)".

3.2.5 Stakeholder engagement

We agree that stakeholder engagement is important. Solutions will need to follow gate three engagement guidance which includes:

- pre-planning statutory consultation as outlined in and described in The Planning Inspectorate Advice Note 11: Working with public bodies in the infrastructure planning process and Annexes A-H⁷
- 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.

3.2.6 Historic environment

During further progress through the gated process, solution owners will continue to develop their environmental assessments, including consideration of the historic environment. A Development Consent Order (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 agree that progress of this solution would benefit from engagement with Historic England. We have added a recommendation to the final decision document.

⁷ [Advice notes | National Infrastructure Planning \(planninginspectorate.gov.uk\)](https://www.planninginspectorate.gov.uk/advice-notes/)

3.2.7 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 best 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.

Gate three submissions should include a summary of the best value considerations relevant to the preferred option for each solution included in all the individual company WRMPs and regional plans where the solution appears. This should include the consideration of financial cost and how it will achieve an outcome that increases the overall benefit to customers, the wider environment and overall society. Benefits to consider could include any amenity or recreation value, regional economic impact, multisector benefits, and other societal benefits.

The solution owners will need to justify their site selection through the planning process.

3.2.8 Chalk Streams

We support the restoration of chalk streams and the possibility of delivering reductions in abstraction as soon as is practicable. Whilst SESRO could help support chalk stream recovery, the concept of Chalk Streams First as a whole is wider than a single solution. Reductions in abstraction from the Chalk by Affinity Water have been included in the demand modelled by WRSE, with best value options to support any reduction in supply also identified through the WRSE modelling.

3.2.9 Decision making

The NPS for Water Resources Infrastructure will be used as the primary basis for examination by the Examining Authority of development consent order 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.

The funding 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.

3.2.10 Solution design

We agree that dam safety will be a critical part of the solution design. Thames Water have appointed an independent Reservoir Advisory Panel to advise on the solution. This panel will provide independent design advice on all matters associated with reservoir safety in the design process. This group includes a geotechnical specialist, a tunnelling specialist and Thames Water's Reservoir Safety Manager. This group will review and advise upon all pertinent elements of the design (embankment, geotechnics, tunnelling, erosion protection and so forth) as part of the solution's quality assurance. Thames Water also plan to appoint a Construction Engineer to work on design activities for gate three. Operational safety and security aspects are also part of the work programme for gate three.

Ground investigation, compaction trials, and embankment design are planned for the design activities during gate three. The SESRO gate two submission includes a project delivery plan that sets out the reservoir commissioning period, including time to fill the reservoir for first use. This activity is also included in the programme dependencies, assumptions and risks.

Through the detailed design process in gate three, RAPID will engage with the solution team to request further refinement of the volumes of the reservoir allocated for emergency storage (required for extreme drought scenarios) and dead storage (below the emergency storage volumes restricted by operational and water quality constraints).

GARD raise a number of points that can be grouped under solution design. In gate three, solution design information should be developed to a standard suitable for pre-application planning consultation as per planning policy in England and/or Wales as appropriate.

3.2.11 Flood risk

Any development in the floodplain will require appropriate flood compensation to be provided so that flood risk is not increased. The Environment Agency will review any flood risk assessments to support scheme development to ensure they are robust and inform appropriate compensatory measures.

The Environment Agency carried out a formal review of the flood risk modelling in early 2023 and provided extensive feedback to Thames Water on improvements that need to be progressed to ensure flood risk modelling is robust and fit for purpose.

We have set an action for the solution to work with the Environment Agency flood risk team to refine and develop flood risk modelling in gate three to inform any future DCO application.

Flood risk from large, raised reservoirs is addressed by the Reservoirs Act 1975 which requires certain measures to be taken to manage that risk by reservoir undertakers. In England, the function of regulating reservoir undertakers under the 1975 Act is carried out by the Environment Agency. This risk issue is not a matter for Ofwat or the gated process.

3.2.12 Gate timing

The solutions are due to start construction at different times, 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 application activities. Beyond gate three, the timings also become more dependent on external factors such as the planning application process. The need for flexibility and bespoke solution gate timings will be reflected in future decisions.

3.2.13 Water quality

Water quality assessment has been progressed in gate two, with new models being built for the Thames and the Reservoir. The assessment of water quality was considered sufficient for gate two. Updates to the model developed for gate two are currently being undertaken, with feedback from Environment Agency specialists to ensure that water quality is robustly modelled, impacts are characterised and mitigation can be provided where needed. This will include management of water quality in the reservoir.

Water quality modelling for SESRO will continue to be refined through gate three. The solution owners will continue to develop their water quality modelling and a detailed investigation including potential for algae growth and impacts for gate three, as identified in the list of gate three activities in their gate two submission. Water quality assessment at gate three will include monitoring, testing, and identifying the potential need for mixing. A recommendation of 'Provide a programme of work to clarify the review and mitigation of the reservoir's mixing and thermal stratification risks.' has also been set.

3.2.14 Construction impacts

The solution owners will continue to develop their environmental and other assessments of the solutions that will encompass further, more detailed consideration of construction impacts including traffic impacts, noise and vibration and air and light pollution throughout the gated process and will need to complete this work before submitting their Development Consent Order (DCO) application or local planning application(s).

3.2.15 Climate change

Through WRSE's draft regional plan consultation, Ofwat have fed back that WRSE companies have tested more extreme scenarios for climate change and demand and combined these scenarios, which is driving requirements for investment. WRSE must demonstrate in its final plan that its proposals are low-regret and plausible scenarios have been used to optimise the selection and timing of key enhancements. RAPID will assess how this impacts timing and selection of solutions in its programme.

3.2.16 Document consistency

Stakeholders identified inconsistent wording in Figure 3 across SESRO, STT and T2ST decision documents. 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 any aspect of our decision at gate two and we have decided to maintain the wording in the figure.

3.2.17 Solution progression

Solutions are 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 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.

The gated programme is not designed to be comprehensive - not all large solutions included in WRMP19 preferred or alternative plans are in the RAPID programme. Companies are also funded to investigate and develop evidence to deliver other WRMP19 solutions and prepare WRMP24 solutions through inclusion in their business plans.

Solutions could be slowed down if not on 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.

Concerns were raised that STT will not be progressed if SESRO goes ahead. We have assessed the quality of the gate two submission for SESRO and STT against the criteria set out in the

gate two guidance. We are satisfied that both SESRO and STT are viable solutions at this stage and we consider that further investigation of SESRO and STT and its connected solutions should be continued to gate three.

Stakeholders have asked that smaller nature-based solutions are considered. Ofwat are encouraging nature-based solutions through PR24 as referred to in PR24 final methodology Appendix 9 Setting Expenditure Allowances⁸.

Stakeholders raised concern that the scheme is progressing to gate three without RAPID having received the relevant information on construction and procurement. Our assessment at gate three will focus on breadth and comprehensiveness of activities being undertaken in preparation for planning application submission, activities progress including programme through to their completion, and consideration of specific activities to address particular risks or issues associated with a solution. Activities not covered by the planning and consenting process, such as commercial arrangements and procurement, may still be assessed for quality.

3.2.18 Social impact/ wider benefits

We agree that additional benefits to the local community and the environment are an important aspect of the RAPID solutions. The assessment of recreational benefits was considered sufficient for gate two. Solution partners will continue to investigate opportunities to realise the wider benefits that could be developed as part of the solution.

Gate three submissions should include a summary of the best value considerations relevant to the preferred option for each solution included in all the individual company WRMPs and regional plans where the solution appears. This should include the consideration of financial cost and how it will achieve an outcome that increases the overall benefit to customers, the wider environment and overall society. Benefits to consider could include any amenity or recreation value, regional economic impact, multisector benefits, and other societal benefits.

3.2.19 Deployable output and drought resilience

The use of stochastic flow data reflects the requirement to test droughts larger than those observed in the historic record, such as drought events with 1:500 year return periods. Solution generation of stochastic flow data is expected to follow Water Resource Planning

⁸ [PR24 final methodology Appendix 9 Setting Expenditure Allowances](#)

Guidelines Supplementary Guidance: Planning to be resilient to a 1 in 500 drought (England), and Supplementary Guidance: Stochastics.

GARD's concerns around lack of assessment of long duration droughts and the impact on deployable output of Abingdon reservoir are also included in GARD's response to the Water Resources South East consultation. As these matters concern water resources planning, it is the responsibility of WRSE and Thames Water to answer these queries as part of the consultation response process.

3.2.20 Environmental impact

RAPID's remit is to provide oversight of the gated process established to support, review and challenge the development and delivery of 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, hence 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 solution owners will need to demonstrate how they intend to address these requirements as part of their applications for DCOs or local planning applications. The Environment Agency and Natural England are both involved in the work of RAPID to ensure significant environmental impacts are identified by the solution owners and that appropriate mitigation for those impacts is included in solution development.

A Council suggest that their landscape officers should have the opportunity to input into the scoping and methodology of the LVIA. A technical working group has been set up with representatives from NE, Area of Outstanding Natural Beauty (AONB) Board and local councils to progress the landscape and visual impact assessment.

3.2.21 Environmental reporting

Concern was raised on the absence of an Environmental Impact Assessment (EIA) until 2026. The environmental assessment of solutions prior to the completion of full EIAs will develop further at each gate as the baseline monitoring increases and impacts are confirmed for the conceptual design. Environmental monitoring for SESRO is still underway and at this stage is insufficiently developed to support a full EIA, however, is fit for purpose for gate two. In addition, monitoring of some areas has not yet been possible due to land access restrictions, so there is still monitoring to be undertaken in these areas. The Environment Agency have reviewed monitoring plans for the coming months to continue to understand progress on assessing the baseline conditions and environmental impacts of the solution to support

development of the formal EIA for the subsequent DCO and/or local planning application processes. This is also dependent on selecting either a 100Mm³ or 150Mm³ size reservoir.

3.2.22 Board statement and assurance

We disagree with GARD's view that the assurance statements provided by Thames Water and Affinity Water are unsatisfactory because they were externally assured by Atkins Limited. GARD consider that Atkins are not impartial due to their involvement with Thames Water's WRMP and with a Water UK report in 2016 on water resource planning.

RAPID's gate two guidance indicates that external assurance of board statements for gate two is optional. Furthermore, the fact that an external assurer has been involved in other work for one of the companies whose statement it is assuring and in other work for the wider water industry does not compromise the value of their assurance relating to this solution.

3.2.23 Risks

Our assessment at gate three will focus on breadth and comprehensiveness of activities being undertaken in preparation for planning application submission, activities progress including programme through to their completion, and consideration of specific activities to address risks or issues associated with a solution. Activities not covered by the planning and consenting process, such as commercial arrangements and procurement, may still be assessed for quality.

3.2.24 Independent expert review

The areas raised by GARD are within the ambit of the town and country planning process or other statutory controls. To satisfy the requirements of these controls, the solution owners will need to satisfy the independent regulatory authorities which governs these processes. This independent regulation will address the concerns raised by GARD.

Our assessment at gate three will focus on breadth and comprehensiveness of activities being undertaken in preparation for DCO or planning application submission, progress of activities including a programme through to their completion, and consideration of specific activities to address risks or issues associated with a solution, some of which have been highlighted here by GARD. Our assessment at gate three will cover the progress that the solution owners are making in this respect. Detailed technical assessment of the solution will be the role of the independent regulatory authorities that will consider the DCO, planning and other statutory applications which will be made by the solution owners. It will not be a function for Ofwat or RAPID in the gated process.

3.2.25 Recommendations for gate three activities

GARD makes several recommendations. Recommendations 1 to 4 will be addressed by the independent Reservoir Advisory Panel the solution owner has appointed. This panel will provide independent design advice on all matters associated with reservoir safety in the design process. This group includes a geotechnical specialist, a tunnelling specialist and Thames Water's Reservoir Safety Manager. This group will review and advise upon all pertinent elements of the design (embankment, geotechnics, tunnelling, erosion protection and so forth) as part of the solutions quality assurance.

Flood risk from large, raised reservoirs is addressed by the Reservoirs Act 1975 which requires certain measures to be taken to manage that risk by reservoir undertakers. In England, the function of regulating reservoir undertakers under the 1975 Act is carried out by the Environment Agency. This risk issue is not a matter for Ofwat or the gated process. Action 7 is "Work with the Environment Agency flood risk team to refine and develop flood risk modelling" and covers GARD's sixth recommendation.

Regarding GARD's seventh recommendation, WRSE and RAPID held a workshop on stochastic modelling to give an overview of the techniques that have been deployed, as well as providing a platform for a Q&A session to help with transparency.

Regarding GARD's eighth recommendation, the Natural Capital Assessment and Biodiversity Net Gain assessments at gate two were reviewed by independent consultants and found to be of a high standard. The assessments are expected to be refined and improved through gate three, as designs develop more detail.

In gate three, solution design information should be developed to a standard suitable for pre-application planning consultation as per planning policy in England and/or Wales as appropriate and covers GARD's ninth recommendation.

With regard to GARD's tenth recommendation, time to fill the reservoir will be covered as the solution moves from concept design to detailed design.

GARD also suggested the Environment Agency should provide additional information:

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 and that indicative flows will be refined further in gate three.

The environmental evidence and assessments completed to date by STT indicate that 175MI/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 25MI/d.

Water companies are required to undertake monitoring, modelling and assessment to understand the treatment levels required for any new discharge. As Netheridge and Minworth introduce treated effluent to new locations and in the case of Minworth a new waterbody, they are considered new discharges and have to comply with the policy and processes of the Environment Agency's permitting regulations.

Treatment will be required where a transfer poses environmental risk and water companies are responsible for designing appropriate treatment.

Further water quality modelling will be undertaken in gate three. This modelling will inform any possible water treatment required (and associated water quality discharge permits if required).

Thames Water modelling of temperatures, as documented in Annex B.2.2 Water quality assessment report of the London effluent reuse SRO gate two submission shows why larger Teddington schemes do not comply with Water Framework Directive temperature and environmental requirements.

The evidence to support an SRO is produced by the water companies proposing them and the Environment Agency will assess that evidence alongside other relevant information to determine if a scheme meets environmental requirements and is acceptable to permit. Any permitting decisions will be appropriately evidenced.

4. Solution assessment summary

Table 2. Final decision summary

Recommendation item	South East Strategic Reservoir
Solution owners	Affinity Water Thames Water
Should further funding be allowed for the solution to progress to gate three?	Yes
Is there evidence all expenditure is efficient and should be allowed?	Yes
Delivery incentive penalty?	No
Is there any change to partner arrangements?	No
Are there priority actions for urgent completion?	No
Are all priority actions and actions from previous gates addressed?	Either complete or partially complete as set out in Section 5.2
Suitable timing for gate three has been proposed	Yes, January 2025 is suitable for gate three.

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. 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

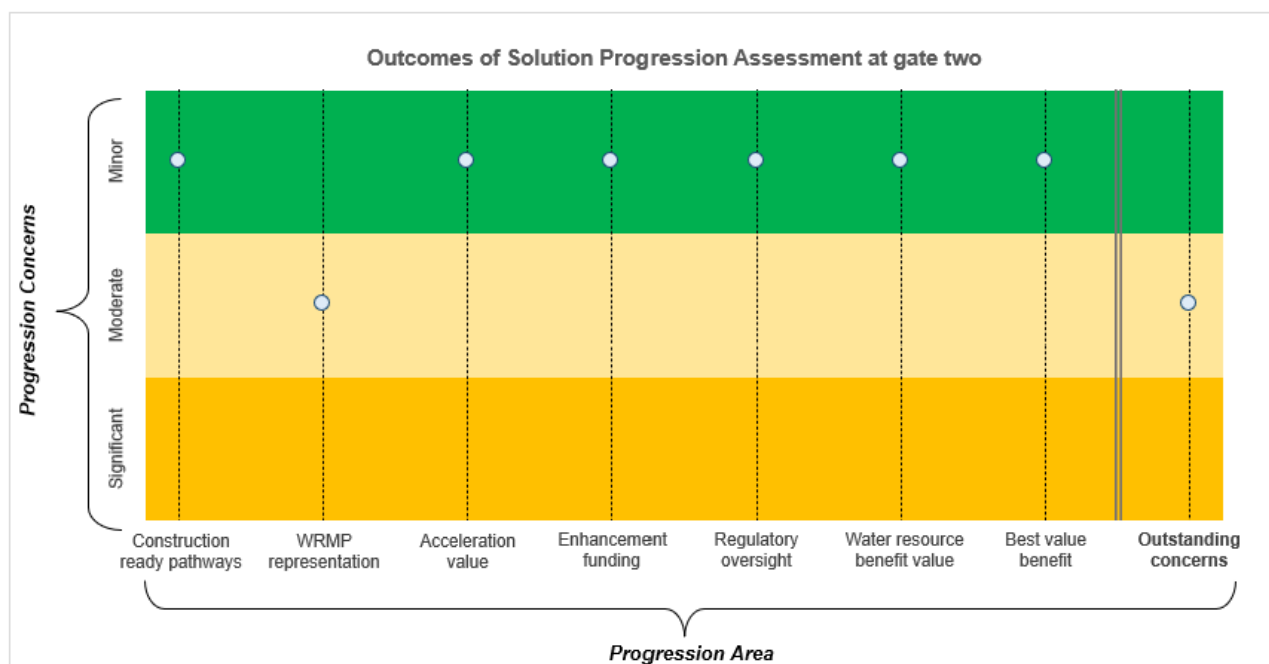


Table 3. Final decision progression criteria

Progression criteria	South East Strategic Reservoir
Solution owners	Affinity Water Thames Water
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's and Affinity Water's draft WRMP24, as a solution on its preferred pathway, which is the relevant plan for the standard track. The solution is also in the WRSE draft regional plan. The solution will be construction ready by 2039/40. 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?	Yes, the regulators have concerns on how the solution is represented, and the information about it, in Thames Water and Affinity Water's draft WRMP24, and WRSE's draft regional plan. <ul style="list-style-type: none"> There is a need to understand the sensitivity of the 100 Mm³ vs 150Mm³ option being selected as the best value option if the size of the Havant Thicket Water recycling option were to reduce (current feasibility and deliverability concerns). There are currently no environmental showstoppers which have been identified for SESRO 150Mm³ at gate two. However, there remains a question over whether the 100Mm³ or 150Mm³ option is most resilient, and whether the 100Mm³ is better environmentally and this needs further justification from the companies. This is also a recommendation in regulator responses to the WRMPs and WRSE regional plan. This progression concern is addressed in section 4.4.3 and gate two actions 2 and 3 in Appendix A of this document.

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 and Affinity 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. The following outstanding concerns have been identified at this stage: <ul style="list-style-type: none"> • There are some concerns around the methodology for the Landscape and Visual Impact Assessment (LVIA) that need to be agreed with Natural England but we expect this to be resolved in gate three. • The flood risk modelling is still under review and therefore we have not commented on this at this time. We will work with Thames Water to ensure the flood risk model and risk assessment meet requirements. It is possible new environmental impacts will arise as land access is granted and additional monitoring and modelling is undertaken.
	This progression concern is addressed in section 4.4.5 and gate two actions 6 and 7 in Appendix A of this document.

4.2 Solution funding to standard gate three

We are not changing the funding of this solution. This solution's total allowance and gate allowances remain the same as the final determination. The details of this funding decision are set out in table 4 below, and details on forward programme in section 8.1.

Table 4. South East Strategic Reservoir funding allowances (2017/18 Prices)

	Gate one	Gate two	Gate three	Gate four	Total
South East Strategic Reservoir gated allowance	£12.17m	£18.26m	£42.60m	£48.69m	£121.72m
Comment	10% of development allowance calculated as 6% of total solution costs	15% of development allowance calculated as 6% of total solution costs	35% of development allowance calculated as 6% of total solution costs	40% of development allowance calculated as 6% of total solution costs	Total development allowance calculated as 6% of total solution costs

This funding is allowed in accordance with the conditions and requirements as outlined in the [PR19 final determinations: Strategic regional water resources solution appendix](#).

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.

South East Strategic Reservoir has carried forward £10.65m underspend from gate one, increasing the allowance available to them at gate two to £28.90m.

Our assessment of the efficient costs as spent on standard gate two activities results in an allowance for this solution of £6.01m (of £6.01m claimed). South East Strategic Reservoir has therefore underspent its combined gates one and two allowance by £22.89m and may take this underspend forward to gate three, increasing the allowance available to them at gate three to £65.49m.

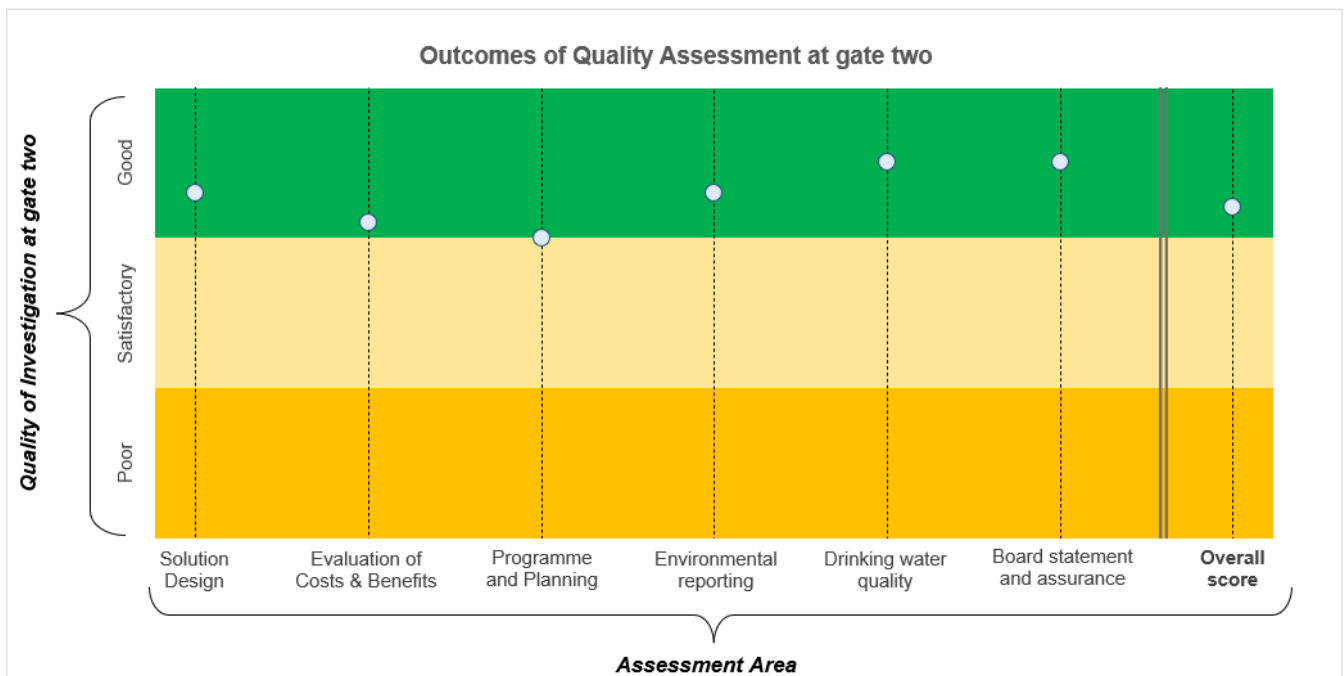
From gate two, we will move to look at the cumulative gate spend against the cumulative total allowance, across all gates consistent with the activities being undertaken. For example, any gate four allowance that is brought forward towards gate three should be for the purpose of early gate four activities. As the South East Strategic Reservoir is progressing to gate three, this will apply here.

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 that meets expectations of gate two.

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 of this assessment of quality, as further detailed in section 6.

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 Thames Water and Affinity Water to have provided sufficient evidence of progress in developing the solution design for gate two; SESRO solution design meets gate two requirements. Interactions with other solutions is well described.

However, the submission is focused on the 150Mm³ option, despite a 100Mm³ option having been selected through best value planning. The 150Mm³ option is very well developed, with a master plan as well as comprehensive infrastructure requirements. If a 100Mm³ option is taken forward, it will need to be developed to the same standard so that appropriate environmental assessment can be undertaken.

Further recommendations relating to the solution options, utilisation and stakeholder engagement are provided.

4.4.2 Solution costs

Our assessment of the unit costs of delivering the South East Strategic Reservoir Option 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, energy requirements have been more accurately estimated using outputs from the updated deployable output modelling. 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 Thames Water and Affinity Water have fallen short of providing sufficient evidence of evaluating the costs and benefits of the solution to an appropriate standard for gate two. Actions relating to the best value assessment and recommendations relating to best value and water resources assessment are included to improve these areas.

Environmental benefits are well explored and assessed through natural capital and biodiversity net gain and meet expectations. Water resources benefits are described for each

SESRO sub-option, but there are complex conjunctive use benefits across the interlinked solutions. As gate two reports are based on a 150Mm³ option, the companies need to show the resilience of the 100Mm³ option compared to the 150Mm³ option and how the 100Mm³ option performs environmentally against the 150Mm³ option. This is also a recommendation for the WRMP and we expect this to also be picked up through that route.

4.4.4 Programme and Planning

Our assessment of the programme and planning considered whether Thames Water and Affinity Water 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 Thames Water and Affinity Water regarding the programme and planning and risks and issues for SESRO to be of sufficient detail and quality for gate two. Risks and mitigation descriptions are satisfactory and meet expectations for gate two. There are currently no environmental showstoppers identified that would prevent SESRO from progressing. 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.

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 Thames Water and Affinity Water to have provided sufficient evidence of embodied and operational carbon commitments for gate two; the carbon assessment meets expectations.

The environmental assessment completed for SESRO for gate two meets expectations in almost all areas. As most work to date has focused on the 150Mm³ option, many of the assessments will need to be repeated for the smaller option if taken forward, as well as being further refined with additional monitoring and modelling proposed for gate three. The Environment Agency will continue to work with Thames Water to develop and refine the flood risk modelling and LVIA methodology.

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 that there is sufficient evidence of progress in the drinking water quality and risk assessment and future work around Drinking Water Safety Plans for gate two. We expect to see further monitoring for emerging contaminants of concern and a programme of work to review risks around reservoir mixing and thermal stratification.

4.4.7 Board Statement and assurance

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

We consider that the boards of Affinity Water and Thames Water have provided a comprehensive assurance statement and have clearly explained the evidence, information and external / internal assurance that it has 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

No priority actions have been identified for South East Strategic Reservoir.

Sixteen actions and recommendations have been identified for South East Strategic Reservoir which should be fully addressed at the gate three submission or at an alternative or earlier date where this has been set in Appendix A. Progress against actions 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 South East Strategic Reservoir can be found in Appendix A.

5.2 Actions and recommendations from gate one assessment

We have assessed whether South East Strategic Reservoir has met actions that were set out as a result of our gate one assessment.

No priority actions were identified for South East Strategic Reservoir.

Nine actions and recommendations were identified for South East Strategic Reservoir which were expected to be fully addressed at the gate two submission.

We have decided that the actions have partially been addressed in the gate two submission. Further detail of our conclusion against each individual action is shown in Appendix B.

Partially complete actions have been linked to gate two recommendations to ensure that these are fully resolved by gate three.

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 no changes proposed to partner arrangements from gate two.

8. Gate three activities and timing

The solution will continue to be funded to gate three as part of the standard gate track.

For its gate three submission, we expect Affinity Water and Thames Water 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

Affinity Water and Thames Water have proposed a date for gate three of January 2025. This is proposed alongside a forward programme of gate four in April 2026, proposed planning application submitted in Autumn 2026, solution construction ready in 2029, and solution operational in 2040.

We agree that the SESRO gate three should be January 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

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.

We have reviewed your forward programme for gate four. Gate four should be scheduled a minimum of a month after the acceptance of planning applications, so suggest gate four should be November 2026.

Appendix A: Gate two actions and recommendations

Actions – to be addressed in standard gate three submission (except where specific dates apply below)		
Number	Area	Detail
1	Solution Design	Confirm to RAPID that the solution aligns with Affinity Water’s and Thames Water’s 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
2	Solution Design	Work with the Environment Agency to develop 100Mm ³ option to the same level as 150Mm ³ option, including environmental assessment, modelling and master planning, to understand the full environmental impact and benefits of the 100Mm ³ option compared to the 150Mm ³ option.
3	Evaluation of Costs & Benefits	Evidence should be provided to RAPID’s satisfaction that 150Mm ³ option does not provide wider drought and South East supply system resilience benefits sufficient to justify the larger scheme compared to the 100 Mm ³ option.
4	Evaluation of Costs & Benefits	Clear and robust best value evidence to RAPID’s satisfaction to be provided in line with WRMP recommendations to demonstrate 100Mm ³ is preferred over 150Mm ³ option. We would welcome confirmation that abstraction reductions at Farmoor and wider environmental destination scenarios for the southeast can still be supported with a smaller scheme being progressed.
5	Programme and Planning	More information to RAPID’s satisfaction to be provided on wider key risks and mitigations around construction and procurement.
6	Environment	Review and update landscape and visual impact assessment (LVIA) methodology with Natural England
7	Environment	Work with the Environment Agency flood risk team to refine and develop flood risk modelling.
Recommendations		
Number	Area	Detail
1	Solution Design	Update the solution design to reflect the preferred solution size.
2	Solution Design	Thames to Southern transfer water treatment works is currently located on the SESRO site but has not yet been incorporated into the solution design. It should be clarified which of the SESRO options could accommodate both the reservoir and the Thames to Southern water treatment works within the site space
3	Solution Design	Remove utilisation uncertainty or assumptions where required by gate three.

4	Solution Design	Local customer and stakeholder engagement to continue to gate three.
5	Solution Design	Engagement with Historic England to be completed by gate three.
6	Evaluation of Costs & Benefits	Show directly how the benefits of the solution align with Ofwat's Public Value Principles.
7	Evaluation of Costs & Benefits	SESRO-STT-T2ST conjunctive use benefit of 19Ml/d plus any other in-combination deployable output impacts with other solutions including with T2AT should be accounted for within the regional modelling. Present water resources benefit under dry year critical periods in addition to dry year annual average under 1 in 500 drought resilience and climate change.
8	Evaluation of Costs & Benefits	Use environmental assessments to inform new masterplan development of the 100 Mm ³ option to inform environmental risks and opportunities.
9	Drinking water quality	Provide a programme of work to clarify the review and mitigation of the reservoir's mixing and thermal stratification risks.

Appendix B: Gate one actions and recommendations

Actions – addressed in standard gate two submission			
Number	Area	Detail	RAPID assessment outcome
1	Solution Design	Determine deployable output (DO) benefits when the South East Strategic Reservoir Option-Severn to Thames Transfer (SESRO-STT) joint options are combined with Thames to Southern transfer (T2ST) rather than supplying London only, as outlined in response to query SER004.	Complete – Link to gate two recommendation 7.
2	Solution Design	Provide a detailed assessment of interdependencies and in-combination impacts with other strategic resource solutions and other options following the outputs of Water Resources South East (WRSE) modelling.	Partially complete - Link to gate two recommendation 7.
3	Environment	Provide a landscape and visual impact assessment, the project team should engage with and work with the AONB Board on this.	Complete
Recommendations			
Number	Area	Detail	RAPID assessment outcome
1	Solution Design	Continue investigation of combined SESRO-STT modelling to determine any additional DO benefits and report on findings.	Complete – Link to gate two recommendation 7.
2	Costs and Benefits	Revise environmental findings of WRSE in-combination assessment.	Complete
3	Costs and Benefits	Further investigate the DO conjunctive use benefits associated with the Thames to Affinity transfer (T2AT).	Complete – Link to gate two recommendation 7.
4	Costs and Benefits	Further consider the conjunctive use benefits of the SESRO and STT solutions, we note that SESRO and STT submissions at gate one differ on this point.	Complete – Link to gate two recommendation 7.
5	Environment	Provide further detail on how the Thames Water Asset Planning System aligns with or diverges from other standard carbon footprinting methods as this would improve the consistency of the submission.	Complete

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