

Regulators' Alliance for Progressing
Infrastructure Development

ii | 2022



Standard gate one final decision for South East Strategic Reservoir Option



Contents

1. Introduction	3
2. Solution summary	4
3. Summary of representations	6
3.1 Representations received	6
3.2 Our Response	21
3.2.1 Transparency of cost estimates	22
3.2.2 Deployable output assessments and stochastic flow data	22
3.2.3 Carbon	22
3.2.4 Flood risk	23
3.2.5 Landscape impacts	23
3.2.6 Construction impacts	24
3.2.7 Invasive Non-Native Species	24
3.2.8 Environmental impacts	24
3.2.9 Water quality	24
3.2.10 Social impact	24
3.2.11 Solution justification	25
3.2.12 Alternatives to SESRO	25
3.2.13 Stakeholder engagement	26
3.2.14 Regulation losses	26
3.2.15 Reservoir fill risks	26

3.2.16	Resource failure risk	26
3.2.17	Adaptability	27
3.2.18	Socioeconomic assumptions	27
3.2.19	Site justification	27
3.2.20	Transparency of the gated process	27
3.2.21	Utilisation of gate one underspend at gate two	28
4.	Solution assessment summary	29
4.1	Solution progression and funding to gate two	29
4.2	Evidence of efficient expenditure	29
4.3	Quality of submission	30
4.3.1	Solution Design	30
4.3.2	Evaluation of Costs & Benefits	31
4.3.3	Programme and Planning	31
4.3.4	Environment	32
4.3.5	Drinking water quality	32
4.3.6	Board Statement and assurance	32
5.	Proposed changes to partner arrangements	34
6.	Actions and recommendations	35
7.	Gate two activities	36
8.	Incentives for gate two	37
	Appendix: Actions and Recommendations	38

1. Introduction

The purpose of this publication is to set out our final decision in respect of the South East Strategic Reservoir Option (SESRO) strategic regional water resource solution submitted for the standard gate one assessment by solution sponsors Thames Water and Affinity Water¹. The solution includes six options within it. 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 [Thames Water](#)² and [Affinity Water](#)³ websites.

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

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, where a solution impacts Wales, Natural Resources Wales, have reviewed the environmental sections of the submissions, and have provided feedback to RAPID. The Consumer Council for Water provided input to the assessment on customer engagement.

The solution sponsors and other interested parties had the opportunity to respond to the draft decision during the representation period, which followed the publication of the draft decisions on 14 September 2021. 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 “South East Reservoir Option”.

² [Thames Water - Gate One submission - SESRO \(thameswater.co.uk\)](#)

³ [Affinity Water - Gate One submission - SESRO \(affinitywater.uk.engagementhq.com\)](#)

2. Solution summary

SESRO provides storage and a raw water supply to the River Thames during periods of low flow, for release and subsequent re-abstraction in London or for transfer to other water companies in the Southeast.

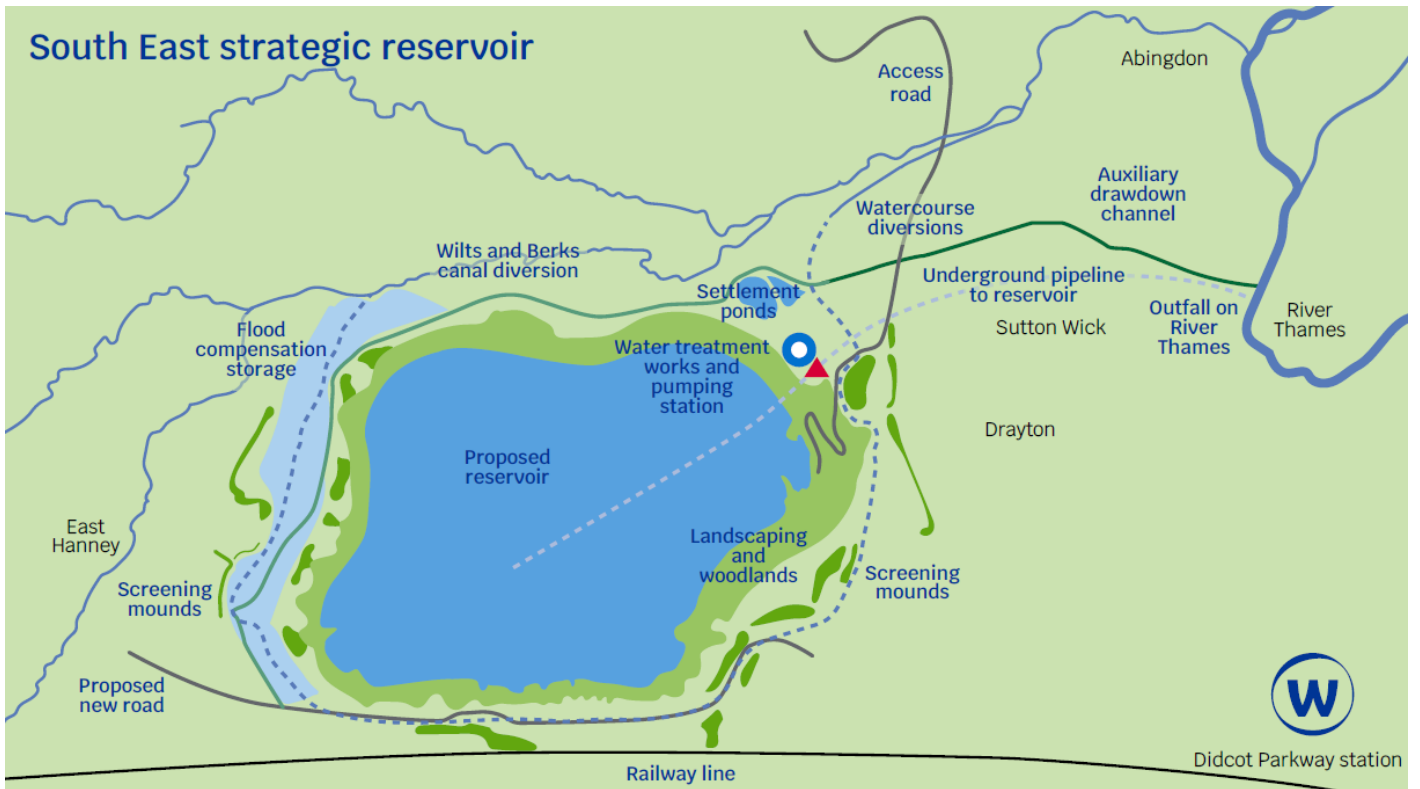
The resource could be used by new and existing infrastructure on the River Thames for supply to Thames Water and Affinity Water, and potentially also for Southern Water through the integration of the Thames to Southern Transfer solution, or South East Water through their existing surface water intake on the River Thames at Bray.

There were six options defined at WRMP19 and reviewed for gate one, including four single-phase variants and two dual-phase variants. The single-phase variants are defined by the capacity of the reservoir, and the capacities under consideration are 75Mm³, 100Mm³, 125Mm³, and 150Mm³. The dual-phase variants are being considered to investigate whether it is appropriate to bring a first phase online sooner to fill the anticipated short-term deficit, followed by a phase two reservoir on the remainder of the site at a later date. These dual phases are considered in capacities of 30 + 100 Mm³ and 80 + 42 Mm³. A summary of the options variants is included in Table 1 below, and a schematic of the solution is shown in Figure 1.

Table 1. SESRO Options Summary

Option Variant	1 in 500 year, Dry Year Annual Average (Ml/d)
150 Mm ³	293
125 Mm ³	244
100 Mm ³	195
75 Mm ³	155
30 + 100 Mm ³	68 / 186
80 + 42 Mm ³	163 / 75

Figure 1. SESRO Schematic



3. Summary of representations

3.1 Representations received

We have received the following representations relevant to SESRO.

Table 2. Summary of Representations

Representation from	Summary of representation
Group Against Reservoir Development (GARD)	<p>Transparency of cost estimates</p> <ul style="list-style-type: none"> • GARD cites concerns over a lack of transparency in solution cost estimates generally, requesting further detail to the level that was included in the Fens reservoir gate one report. <p>Deployable output assessments and stochastic flow data</p> <ul style="list-style-type: none"> • GARD is also concerned about a lack of transparency in deployable output (DO) assessments, suggesting the evidence should be made available for scrutiny of the assumptions, data, and outputs of the modelling. • GARD has concerns over the reliability of stochastic river flow data, such as: inaccurate weather data for groundwater-dominated catchments; the stochastic weather base period not containing any long duration droughts; the base period excluding weather since 1997; and the geological difference in catchments not being reflected in the generated Thames and Severn flows. • GARD believes the DO of the 150 Mm³ options is in the range of 180-220 Ml/d, compared to the gate one submission estimate of 294 Ml/d. The difference arises from the assessments of the reservoir's performance in long duration droughts and allowance for emergency storage. • GARD proposes that there should be a specific action or recommendation requiring Thames Water to address issues GARD has raised regarding DO when reassessing for gate two. • GARD also recommends that RAPID commission a comprehensive audit of Thames Water's assessment of SESRO's DO, taking account of GARD's detailed criticisms. <p>Regulation losses</p> <ul style="list-style-type: none"> • GARD states that no evidence has been presented supporting the allowance of 2% losses in the Thames for water transferred via regulation from the reservoir to

London, and notes that this is far lower than the 20% being considered for regulation releases from Vyrnwy.

- GARD urges RAPID to require full and transparent investigation of the Thames regulation losses for gate two, using similar methods to those used in assessing River Severn regulation losses.

Carbon

- GARD asserts that the gate one reports are poor on the subject of carbon costing of strategic options and have shortcomings in the data presented.
- GARD would like to see more detailed and transparent analysis of the embodied carbon in construction of the reservoir, taking account of the large volumes of earth moving and quantities of imported rip-rap required in the 10km length of the embankments.
- GARD states that Thames Water's embodied carbon figure needs more justification, noting inconsistencies with embodied carbon figures for the South Lincolnshire Reservoir (extrapolating those numbers would lead to higher figures than those reported by Thames).

Flood risk

- GARD does not have confidence in the companies' flood modelling that shows the reservoir leading to a reduction in flood risk for Abingdon.
- GARD urges that more detail of flood impact assessments should be made available for a detailed and transparent review by the EA during gate two and the EA's review should consider flooding impacts on local villages as well as wider impacts on Abingdon and the Thames Valley.

Invasive Non-Native Species (INNS)

- GARD would like there to be more detailed assessments of mitigation measures to control INNS in the reservoir and evidence to show that these measures are consistent with measured proposed for controlling INNS for Severn to Thames Transfer (STT).

Reservoir fill risk

- GARD recommends that risks associated with filling the reservoir, such as loss of storage and need for dredging if

water contains high suspended solids, are investigated at gate two.

Water Quality

- GARD notes that water quality modelling has focused on chemical water quality and does not appear to have covered algal growth, which GARD believes is a major issue that has not been properly addressed by the Environmental Assessment Report (EAR).
- GARD suggests a detailed investigation of algal growth in the reservoir and consequent impacts on regulation releases into the Thames, taking account of low water turnover, long periods of reservoir draw-down, and shallow water in emergency storage.

Adaptability

- GARD suggests that RAPID should not allow "adaptability" to remain as a listed benefit of SESRO in the gate two submission as GARD does not believe the reservoir to be adaptable as it cannot be scaled back if circumstances in water demand change.

Social impacts

- GARD would like to see detailed proposals for planned recreational use of the reservoir.
- GARD believes that leisure and amenity benefits have been double-counted and state that the new recreation opportunities that the reservoir brings are water-based, as the area originally promised for screening, leisure areas, and nature areas, has now been swallowed by the larger size of the reservoir.
- They mention that local water-based activities are already available nearby and thus do not see how the reservoir would have a major beneficial effect.
- The group states that water-based leisure activities may be severely curtailed by floating solar, security issues that may limit general public access to the area, concerns over the introduction of invasive species, and carbon budget constraints.
- GARD suggests that assessments of natural and social capital should take account of restrictions in recreational use arising from INNS avoidance and the plans for solar energy, as well as negative impacts from construction.

	<p>Landscape impacts</p> <ul style="list-style-type: none"> • GARD urges more detailed landscape investigations that include more focus on visual impact on local villages to be done in collaboration with local authorities as well as the Area of Outstanding Natural Beauty (AONB). • GARD raises the concern that any proposed mitigation occurs after the construction is near complete and ignores the 10-year period during which no mitigation is in place. • GARD believes that RAPID should insist on new schematics drawn up to include new and proposed developments for this assessment. <p>Construction impacts</p> <ul style="list-style-type: none"> • GARD suggests detailed assessment of construction impacts on local people and businesses, including forecast traffic movements and noise impacts and air pollution. • GARD also raises concerns that the mitigation proposed for impact on air quality will not have any effect until after the construction phase is complete, and there is no assessment of the disbenefit of 10 years of excessive diesel fumes and dust, and no assessment of the effect on pollution absorption of the loss of over 4 square miles of vegetation.
<p>Wantage and Grove Campaign Group (WaGCG)</p>	<p>Water quality</p> <ul style="list-style-type: none"> • WaGCG raises the danger of poor water quality in the reservoir, especially algal growth, that was identified in the Environmental Assessment Report (EAR). WaGCG notes that the water quality modelling has focused on chemical water quality and not algal growth. • WaGCG believes that the threat of algal growth in the reservoir and impact of algal-laden reservoir releases is a major issue that has not been properly addressed in the EAR. • The group recommends that gate two investigations should include detailed algal modelling, full mitigation measures to manage algal growth and evidence of their effectiveness, consideration of the shallow depth of water in drought years, and consideration of other algal growth in other large shallow reservoirs. <p>Social impacts</p> <ul style="list-style-type: none"> • WaGCG raises that Thames Water has not explained how the leisure and amenity possibilities of the new reservoir have a "Major Beneficial" rating. They mention that local water-

	<p>based activities are already available nearby and thus do not see how the reservoir would have a major beneficial effect.</p> <ul style="list-style-type: none">• The group states that water-based leisure activities may be severely curtailed by floating solar, security issues that may limit general public access to the area, and concerns over the introduction of invasive species.• The group does not believe there is sufficient information on which to decide the future of the community and its environment. <p>Landscape impacts</p> <ul style="list-style-type: none">• WaGCG is disappointed that the Landscape and Visual Impact Assessment (LVIA) to be undertaken at gate two will not be a full LVIA that considers all landscape and visual effects within the study area of the proposal site but will instead focus on AONB. <p>Construction impacts</p> <ul style="list-style-type: none">• The group believes that the submission downplays the construction impact of a 10-year project on both the biodiversity and landscape of the area, and omits any estimation of effects of noise, light pollution, and transport dislocation on residents of the area.• WaGCG raises the high volume of housing development in the proposed site area as a concern regarding the disruption from a lengthy construction period, resulting road congestion, and visual impact for homes.• They ask that Thames Water be required to provide a separate assessment report on gate two on the impacts of construction on local residents and businesses, including assessments of visual impact, noise, air and light pollution, traffic disruption, and how construction will meet the zero carbon ambitions of the Vale of the White Horse. <p>Flood risk</p> <ul style="list-style-type: none">• WaGCG is concerned that Thames Water has not yet done any detailed designs to show flooding and leakage risks and how these could be mitigated.• The group raises risks that water from the reservoir could leak into the greensand below it, which is very permeable. The reservoir also may increase flood risk to the vale by covering over one square mile of the land that soaks up flood water.• The group asks RAPID to require Thames Water's flooding report to be made public for scrutiny and asks the EA to
--	---

	<p>make a publicly available review of the acceptability of Thames Water's proposals for mitigation of flood impacts.</p>
<p>CPRE Oxfordshire</p>	<p>Environmental impacts</p> <ul style="list-style-type: none"> • CPRE believes the adverse impacts on habitats and species within the reservoir footprint nearby wildfire sites during construction stated in the Strategic Environmental Assessment (SEA) are considerably understated. • CPRE states that biodiversity net gain cannot be delivered in the reservoir footprint and can only be achieved through remote offsetting, and is doubtful that remote offsetting will deliver on its promises. • CPRE suggests that the biodiversity impact is severely damaging and that the plan should explicitly state that the offsetting can only be remote and needs to identify the risks to this approach. <p>Flood risk</p> <ul style="list-style-type: none"> • CPRE also urge that more detailed flood impact assessments should be made (and made available) as part of gate two, including impacts on local villages, as well as impacts on Abingdon and the Thames Valley, and the management rules of the reservoir. <p>Carbon</p> <ul style="list-style-type: none"> • CPRE does not believe the high construction and embodied carbon emissions associated with SESRO can be mitigated by low carbon machinery and EV charging points. • CPRE recommends a thorough and transparent carbon impacts assessment be made before this solution can progress. <p>Landscape impacts</p> <ul style="list-style-type: none"> • CPRE recommends an honest and independent assessment of the landscape impact needs to be undertaken before this solution can progress as there will be a large visual impact on local settlements. <p>Construction impacts</p> <ul style="list-style-type: none"> • CPRE proposes that in gate two there should be detailed investigations of traffic, noise and air pollution impacts

	<p>during construction, with design and costing of mitigation measures.</p> <p>Resource failure risk</p> <ul style="list-style-type: none"> • CPRE suggests that there needs to be a more detailed, hydrological analysis, using longer data records, of the risk of the storage scheme not performing in a drought scenario if SESRO is to progress. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • They believe that the risk register is not realistic about the considerable opposition to this scheme across Oxfordshire.
<p>East Hanney Parish Council</p>	<p>Flood risk</p> <ul style="list-style-type: none"> • The council is concerned about the potential flood risk from the reservoir, despite Thames Water's assurance that there is no increased risk of floods. Thames Water should be required to retract this statement. • There is risk that the tonnage of water will impact underlying geology and aquifers, leading to underground flows and flooding in surrounding villages. <p>Solution justification</p> <ul style="list-style-type: none"> • The council does not believe that there is demand or need for a reservoir of this size. • They state that demand from the population in the area will be much smaller than projected as a result of adjusted population projections, and either no reservoir or a much smaller one would be required. • The council suggests that the real reason behind SESRO is to provide water supply to third parties, which is a commercial matter and outside their core requirement to provide and manage resources in Thames Water's own region. They state that this is about profit and should not be allowed as it is an environmental and financial cost to the customers whom Thames Water is appointed to serve. <p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • They assert that Thames has failed to address leakage and deliver a sustainable leakage prevention solution – they should be focusing on reducing leaks instead of diverting resources to a mega-reservoir to facilitate the sale of water

	<p>to third parties outside the area for which Thames Water has responsibility.</p> <ul style="list-style-type: none"> • The council argue that since there is no evidence of the actual need for the mega-reservoir, it may be more appropriate to serve any shortfall by other options or a smaller reservoir, which would represent much better value for money. • They state that if a second larger reservoir is needed in 2080, then it can be provided closer to then and at a cost to the customers who are to use it at that point. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • There has been a lack of local consultation, Thames Water should be made to undertake a comprehensive local consultation exercise before their proposals are considered further. • Direct consultation should occur in local areas and not in London. • There has been no leaflet drop and Thames has not invited residents to submit comments. <p>Landscape impacts</p> <ul style="list-style-type: none"> • The visual impact will be detrimental to the area. <p>Construction impacts</p> <ul style="list-style-type: none"> • The council believes that the construction impact will be significant as there will be a lot of noise and vibration which could affect the wellbeing of local people. • Surrounding watercourses could be substantially disturbed and polluted during construction and may never recover.
<p>Oxfordshire South and Vale Green Party</p>	<p>Stakeholder engagement</p> <ul style="list-style-type: none"> • The Party believes that the initial consultation has been opaque and not transparent, and that extensions to the representation deadlines were quiet and confirmed too late. • They contend that it is RAPID's job to ensure all future submissions are provided to the public in line with WRMP guidelines, containing all information including project locations and sizes. <p>Flood risk</p>

- They would like all information about flood risk, the basis of calculations, and future climate scenario assumptions to be made public in order to verify the reduced risk of flooding for Abingdon included in the submission than was previously calculated.

Environmental impacts

- The Party states that the submission over-emphasises potential gains and underplays obvious and permanent losses to the environment, does not yet quantify the hedgerows and tree losses, and does not include the impacts of roads, tracks, and pipelines. The submission also gives no indication of how assessments of biodiversity gain or loss will be verified in the long term by independent ecologists and other specialists.

Water quality

- They are concerned that high hazard scores in the water quality risk assessment were dismissed with the assertion that "nothing was identified that cannot be controlled." They consider that there is ample evidence that water contaminated by sewage (such as the Thames catchment) is likely to develop algal blooms in slow-moving or still water bodies such as reservoirs. They do not think that abstraction can be timed to avoid drawing poor quality water from the Thames.

Transparency of costs

- They state that there is no transparency or basic detail about the costs involved in the different aspects of this project.

Location and site selection

- Alternative reservoir locations were rejected due to relying on abstraction from the River Thames, but SESRO also relies on abstraction from the River Thames, so the current selection of SESRO to the exclusion of other locations cannot be justified on this basis.

Carbon

	<ul style="list-style-type: none"> • The party emphasises that the carbon footprint from the construction phase of this project is huge, although they are pleased to see energy recovery being considered. • They expect floating solar to be considered seriously within the planning process for this project to help counteract the carbon cost and the fact that the reservoir will displace at least one large solar farm. <p>Solution justification</p> <ul style="list-style-type: none"> • They assert that if the point of SESRO is to harness water for London use, then the option to transfer out of the Thames into Southern cannot be seriously considered. <p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • The party states that we need a solid water demand management strategy in place nationally, as well as a strategy concerned with supply, including routine effluent reuse, constraining consumption, developing sustainable irrigation in agriculture, rainwater harvesting, and more – all to reduce demand, reduce loss, and reuse water. • They state that the Severn Thames Transfer appears a viable alternative as a cheaper, less disruptive, more resilient, and adaptable solution, though also problematic in several respects.
<p>Earl of Plymouth Estates Limited (EPE)</p>	<p>Solution justification</p> <ul style="list-style-type: none"> • EPE state that the solution is unsuitable due to its distance from the point of demand for water. • EPE believes the water deficit is overstated as the submission does not give sufficient consideration to advances in water treatment technology, energy generation and water saving appliances. • EPE questions the need for the reservoir in light of plans to sell on the water to neighbouring water companies. <p>Solution costs</p> <ul style="list-style-type: none"> • They do not believe there has been adequate analysis of the costs of delivery offered. <p>Environmental impacts</p>

	<ul style="list-style-type: none"> • They assert the environmental impacts have been understated. <p>Community and stakeholder engagement</p> <ul style="list-style-type: none"> • EPE states that inadequate consideration has been given to the local need for new housing and employment within the area. • There has been a failure to engage with landowners. <p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • EPE does not believe there has been enough consideration of other options including water transfer, desalination, groundwater or re-use, or multiple smaller reservoirs closer to the point of demand. • EPE state that there has also been insufficient attention given to reducing supply-side leakages. • EPE do not believe that an open reservoir is a suitable solution due to the predicted increase in hot weather and drought.
<p>Marcham Parish Council</p>	<p>Solution justification</p> <ul style="list-style-type: none"> • The council is concerned that the proposal to construct the reservoir has been for the purpose of supply water to Affinity which serves other areas, and remains unconvinced as to the need of the reservoir. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • The council requests that there be a full public inquiry and the facts of the proposal are fully examined, so parishes can express their views in an open public forum.
<p>Steventon Parish Council</p>	<p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • It is not clear why desalination was omitted. The council believes desalination and reverse osmosis technology should be given greater consideration. <p>Carbon</p> <ul style="list-style-type: none"> • The council finds the carbon calculation to be inadequate.

	<p>Water quality</p> <ul style="list-style-type: none"> • They state that the local climate changes and formation of algae have not been fully considered. <p>Flood risk</p> <ul style="list-style-type: none"> • Any conclusions reached from the modelling approach to flood risk are superficial and not substantiated since the approach was described as "high level".
<p>Garford Village, Ardington and Lockinge Parish Council</p>	<p>Landscape impacts</p> <ul style="list-style-type: none"> • They request visual designs of the proposed structure and how it relates to all villages in the area, in particular showing the colossal bunding, proximity of walls to existing settlements, and overall impact on the Lowland Vale. <p>Construction impacts</p> <ul style="list-style-type: none"> • They request data on air pollution, noise and traffic mitigation measures. <p>Environmental impacts</p> <ul style="list-style-type: none"> • An independent survey on the impact on wildlife from loss of habitat (noting that further surveys will be done at gate two).
<p>POETS (Planning Oxfordshire's Environment and Transport Sustainably)</p>	<p>Socioeconomic assumptions</p> <ul style="list-style-type: none"> • POETS believe that COVID-19 will have had an impact and have possible consequences for growth levels and patterns of development. Therefore, work on the socio-economic scenarios done for WRMP19 needs revisiting. <p>Carbon</p> <ul style="list-style-type: none"> • Construction of SESRO involves very high embodied carbon. POETS request that this be re-appraised, given the UK's commitments to reduce carbon. <p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • POETS state that greater urgency should be given to demand-reduction and leakage reduction measures. They would expect the gate one submission to refer to the

	<p>national commitment to reduce <i>per capita</i> consumption to 110 lpd by 2050.</p>
<p>Vale of White Horse</p>	<p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • There may be alternative options but limited incentives to encourage water companies to prioritise bringing forward multiple solutions or justifying why this is the best solution. • No strategic solution should be pursued without a full understanding of the forecast need for additional water and water savings that can first be achieved through reduced pipe leakage, innovation, and reduced water consumption. <p>Construction Impacts</p> <ul style="list-style-type: none"> • Construction of SESRO will have a negative impact on existing communities during the 10-year construction period. • It will also impact plans to provide new homes for the local community and a new rail station. <p>Carbon</p> <ul style="list-style-type: none"> • There is limited consideration given to climate change and it may not be possible to offset the large carbon footprint associated with SESRO's development.
<p>Oxfordshire County Council</p>	<p>Stakeholder engagement</p> <ul style="list-style-type: none"> • The Council agrees that there is a need for further investigations for SESRO and Oxfordshire County Council, together with local district councils, needs to be involved in considering the detail of the reservoir proposal.
<p>Local Councillors and MPs</p>	<p>Transparency of costs</p> <ul style="list-style-type: none"> • The solution sponsors have failed to provide the calculation of capex and opex. <p>Landscape impacts</p> <ul style="list-style-type: none"> • There has been no landscape impact assessment completed and no mention of any landscape design included in gate two assessments. <p>Construction impacts</p>

- There should be detailed investigation of traffic, noise, and air pollution impacts during construction.
- Concern that there is no mitigation in place during the 10-year construction period and any possible mitigation benefits might not outweigh the negative local impact as there has been a lot of development in the immediate area.
- The environmental impact of the reservoir, including impact of construction in terms of traffic, air quality, water quality, local diversity and carbon emissions, should be discussed with local council.

Water quality

- There should be further investigation of water quality, as the threat of algal growth in the reservoir has not been properly addressed in the environmental reports.

Flood risk

- Reduction in flood risk from SESRO is not properly justified. There is a lack of provision of modelling details, and the modelling is subject to considerably more work and confirmation.
- Independent consultation funded by the regulators should investigate the flood risk to the region, given the red risk in the past.

Carbon

- Carbon cost calculation is not transparent, and the expressed number looks considerably lower than expected.
- Embodied carbon of concrete, earth-moving, materials transport, and support activity should be shown separately.

Alternatives to SESRO

- The need for a reservoir has not been properly investigated and compared with the alternative schemes.
- The STT is a preferable alternative to SESRO due to less carbon, being less disruptive and being quicker to construct.
- Customers prefer leakage reduction and then water transfers instead of reservoirs, and if leak repairs were increased, the need for the reservoir would be negated.

Stakeholder engagement

	<ul style="list-style-type: none"> • A second Public Enquiry may be appropriate to examine the need for a reservoir and its alternatives. • Concern that the community feels Thames Water has not closely worked with them to consider local issues, and that relations with the local community have been damaged as a result of the way the consultation process has been handled. • Thames Water should release their reservation on the land if the SESRO proposal fails.
<p>Members of the public</p>	<p>Solution justification</p> <ul style="list-style-type: none"> • There are concerns over why a reservoir in Oxfordshire serves London and the Midlands. • There are concerns that the reservoir is only designed to benefit private shareholders and provide a holding tank to sell water to other companies. <p>Site justification</p> <ul style="list-style-type: none"> • Members of the public are concerned that the site has not been sufficiently justified in any documentation released, even if the need for a reservoir has been justified. <p>Construction impacts</p> <ul style="list-style-type: none"> • The long build time for the reservoir means that a key access road between Wantage and Didcot will be closed for a long period of time. Traffic would be very high for local residents. • SESRO will use up agricultural land which provides food. <p>Environmental impacts</p> <ul style="list-style-type: none"> • There is no evidence for the submission claim that there could be an increase in terrestrial biodiversity and that there are habitat creation opportunities. • There are many concrete negatives such as damage to biodiversity and soil during construction. <p>Social impact</p> <ul style="list-style-type: none"> • Planned recreational activities may be impossible due to the risk of INNS. • There are many concrete negatives such as damage to population and human health and cultural heritage during construction. <p>Flood risk</p>

	<ul style="list-style-type: none"> • SESRO is a significant flood risk in an area already susceptible to flooding. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> • There is significant concern that local voices are not being heard in the gated process. Some members of the public also feel as though Thames Water has been keeping the proposal from the public as much as possible. • A second full Public Enquiry into SESRO is proposed. <p>Alternatives to SESRO</p> <ul style="list-style-type: none"> • The STT is preferable to SESRO in terms of environmental improvement and impact. SESRO is in contrast to the government’s environmental policies.
<p>Number of stakeholders</p>	<p>Transparency of the gated process</p> <ul style="list-style-type: none"> • The extent of redactions, particularly in the environmental reports, was extensive. • The representation period was too short given the volume of information published by solution owners at the same time as the draft decisions were published. • There was no direct notification to stakeholders of publication of the draft decisions.
<p>Thames Water and Affinity Water</p>	<p>Gate costs</p> <ul style="list-style-type: none"> • They are delighted that gate two funding has been allocated, and that submission received the rating of 'Good'. • Total gate one expenditure was less than anticipated, therefore Thames and Affinity ask whether this underspend may be used on gate two activities.

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.

3.2.1 Transparency of cost estimates

We do not consider information about solution costs to be material to gate one decisions. Gate one is a checkpoint and is the first opportunity to check the progress made by solution owners on investigations and development of solutions in the gated process. At gate one, all solutions were expected to progress to gate two and continue to receive ring-fenced funding unless there was a clear reason why they should not.

Solution costs will be considered further from gate two onwards and in regional plans and water resource management plans. We will provide companies with guidance on presenting and publishing solution costs in their gate two submissions.

3.2.2 Deployable output assessments and stochastic flow data

We consider the work completed on the DO assessment to be sufficient for gate one. The water companies will continue to develop the solutions and evidence surrounding them. Guidance will be provided on our expectations for a more detailed examination of deployable output at gate two. 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 Guidelines Supplementary Guidance: Planning to be resilient to a 1 in 500 drought (England), and Supplementary Guidance: Stochastics.

We will pass on the specific points raised to solution owners for consideration as they develop their deployable output assessments further. At gate two, solution owners will publish their full submissions including annexes and appendices at the same time as submitting them to RAPID, including deployable output assessments.

We expect Thames Water's DO assessments to have been verified through an independent external auditor as part of the water resource management planning process, and have included a requirement for appropriate third party technical assurance as part of the gated process. We have the ability to request from the companies all and any supporting data necessary for us to make our assessments and recognise that, in some instances, there will be need a need for us to carry out further technical due diligence in relation to solution submissions. We will target this work towards areas where we conclude it is necessary in the light of our assessment of the company submissions.

3.2.3 Carbon

Gate one assessment of solution submissions took account of the fact that assessments of the carbon implications of the solution would inevitably contain a significant degree of

uncertainty given the stage of solution development. We consider that the level of information presented on carbon was sufficient for gate one. Solution development to gate two should follow the Water Resources Planning Guidelines for WRMP24 section 8.3.2 which states expectations for accounting for and reducing greenhouse gas emissions. The design should consider; build nothing, build less, build clever and build efficiently throughout the development of the solution, with offsetting only as a last resort. We expect all direct mitigations to be included in the solution costs. The solution should also be considered by the solution owners within their wider carbon plans.

We will require any carbon assessment annexes to be published alongside the submission at gate two.

While companies have made a commitment for operational carbon for 2030, we are asking companies to reduce and mitigate embodied carbon as much as possible using standard approaches and appropriate frameworks. At gate one, we assessed the companies' approach to embodied carbon as sufficient and we expect the accuracy of carbon estimates to improve throughout the gated process.

3.2.4 Flood risk

The flood risk assessment was considered sufficient for gate one and continues to be developed in further detail, working with the EA, through gate two and beyond. Neither the construction of the reservoir itself, nor any emergency arrangements, would be permitted by the Environment Agency if the risk of flooding to people and property is increased.

As noted above, at gate two, solution owners will publish their full submissions including annexes and appendices at the same time as submitting them to RAPID, including flood risk assessments.

3.2.5 Landscape impacts

We have included an action in our final decision for the water companies to provide an LVIA assessment for gate two and to engage with the AONB Board on this assessment. The water companies will work with the National Appraisal Unit to determine the scope of the LVIA and begin engagement and assessment for gate two and beyond. The companies have also begun working on new visuals and schematics and will continue to refine these through the gates.

3.2.6 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.

3.2.7 Invasive Non-Native Species

We are requesting, through gate two guidance, that risk of INNS is fully investigated, including utilising the National Appraisal Unit's INNS tool to identify risk and mitigation measures.

3.2.8 Environmental impacts

SESRO's environmental assessment was assessed as sufficient for gate one. The solution owners will continue to develop the solutions and evidence surrounding them, including environmental and habitats impacts and potential to meet requirements for biodiversity net gain. This was completed at a high level for gate one and will be completed in more detail for gate two, for which RAPID will provide further guidance. It was therefore appropriate for SESRO to progress to gate two, with requests for more detailed monitoring and environmental assessments to investigate the uncertainty that exists for environmental issues.

3.2.9 Water quality

The assessment of water quality was considered sufficient for gate one. The solution owners will continue to develop their water quality modelling and a detailed investigation including potential for algae growth and impacts for gate two, as identified in the list of gate two activities in their gate one submission. Water quality assessment at gate two will not only focus on algae, but will also include monitoring, testing, and identifying the potential need for mixing.

3.2.10 Social impact

The assessment of recreational benefits was considered sufficient for gate one. The solution owners will continue to develop the options and evidence surrounding them, and will reassess conservation, access, and recreation strategy at gate two as included in section 15

of their gate one submission, when the companies have more information on the size of the selected option. RAPID will provide guidance on our expectations for a more detailed examination of wider solution benefits at gate two, and any natural capital assessment should be consistent with WRMP24 guidelines supplementary guidance and regulator feedback on Regional plans and WRMPs.

3.2.11 Solution justification

Water resources planning at a regional and company level is following a best value approach. This allows consideration of how new water sources can be used to bring about best value at a regional and national scale, therefore going beyond the local area. The need for solutions and the decisions on whether or not solutions ultimately go ahead will be made through water resources planning processes and subsequent applications for planning and environmental consents.

3.2.12 Alternatives to SESRO

Solutions will be selected as part of regional plans and WRMPs. These plans consider both demand side measures and supply side measures as part of the twin track approach to water resources. The national framework – published by the Environment Agency in 2020 – set out expectations that the industry reduces demand to around 110 litres per person per day and reduces leakage by 50% both by 2050. Even with these reductions in demand the 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 WRMP19 and prepare WRMP24 through inclusion in their business plans. For example, Thames Estuary desalination options are being considered in the regional plan. 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.

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.

3.2.13 Stakeholder engagement

The solution owners have described their stakeholder engagement plan in their gate one submission as having two parts, the first of which included coordinated stakeholder engagement through Water Resources South East (WRSE) to inform the context of SESRO within the regional planning framework, followed by SESRO-specific discussions which will include targeted stakeholder engagement and active participation of regional and local stakeholders at gate two and beyond. We expect them to implement this stakeholder engagement plan and to engage with stakeholders in their local areas.

Only the Secretary of State may decide to hold an inquiry or other hearing on a WRMP. The development consent order process will require formal consultation with the local community and stakeholders at the pre-application stage prior to submission of an application. Once an application is submitted, the Examining Authority, the inspector(s) appointed to carry out examination of the application will consider what hearings should be held. All hearings are held in public and anyone can attend.

Further details on this can be found on the Planning Inspectorate website.

3.2.14 Regulation losses

The assessment of regulation losses was considered sufficient for gate one. The water companies will continue to develop the solutions and evidence surrounding them and are expanding on this work at gate two. The assessment of River Thames regulation losses is based on the same methodology as used by the assessment for River Severn regulation losses.

3.2.15 Reservoir fill risks

As the risks raised associated with filling the reservoir are inherent in the design and feasibility of any reservoir, we expect that the water companies will investigate this going forward.

3.2.16 Resource failure risk

The water companies have identified further hydrological and geological assessment to be completed in gate two and as part of the WRMP process.

3.2.17 Adaptability

Adaptability in the submission has been used as defined by the WRSE resilience framework. This defines adaptability as an attribute that means the system can undertake a short-term modification of its function to withstand a shock, and is not limited to whether construction can be scaled back if circumstances in water demand change. As proposed, SESRO would have the ability to support multiple other options and solutions if needed.

3.2.18 Socioeconomic assumptions

We expect the water resources planning process to assess the need for these solutions and the socioeconomic assumptions such as those around growth underpinning the modelling for these processes.

3.2.19 Site justification

We expect the solution sponsors to justify their site selection through the planning process.

3.2.20 Transparency of the gated process

A number of stakeholders raised some concerns regarding the RAPID process, particularly regarding the level of redaction in some of the environmental reports published as part of the query responses for SESRO, and the period of time allowed for representations to be made.

RAPID and the solution owners reviewed the extent of redactions in the environmental reports and these were republished, with limited redactions and explanations were provided for those redactions that remain. The representation period for SESRO was extended to give stakeholders time to review the republished reports.

Solution owners are due to make their gate two submissions on 31 October 2022. At gate two, we will be requiring companies to publish their full submissions including appendices and annexes when they submit these to RAPID. RAPID will be providing further guidance to companies regarding redactions to ensure a transparent and robust process. The representation period for gate two will be six weeks.

RAPID is no longer holding a register of stakeholders for direct engagement but will be providing dedicated information for stakeholders on the RAPID website. This will include a full timetable of publication dates and representation periods and links to documents when they are published. Stakeholders can also subscribe to Ofwat updates in order to be notified when changes or new information is made available.

3.2.21 Utilisation of gate one underspend at gate two

Some solution owners raised concerns in their representations regarding whether gate two allowances would be sufficient for completion of gate two activities and suggested that gate one underspend should be carried forward to gate two. The percentage allocations to each gate in our Final Determination at PR19 were inherently imprecise and were based on our understanding of likely profile of activities to be carried out in progressing the development and investigation of solutions taking into account companies' proposals in this respect. We now have an improved understanding of the activities to be carried out at gate two and consider that it will be beneficial to allow funding allowance that has not been used at gate one to be made available to solution owners for carrying out gate two activities.

We have therefore decided to merge gate one and gate two allowances for this solution. This will allow any underspend on gate one activities to be used for gate two activities. We will continue to scrutinise expenditure to ensure that it is appropriate and efficient. Companies remain responsible for management of cost risk to meet gate requirements.

4. Solution assessment summary

Table 3. Final decision summary

Recommendation item	South East Strategic Reservoir Option
Solution sponsors	Thames Water and Affinity Water
Should further funding be allowed for the solution to progress to gate two?	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
Is there a need for a remediation action plan?	No

4.1 Solution progression and funding to gate two

The evidence suggests that the solution is a potentially valuable way of supplying water to customers. Based on our assessment of the potential solution costs and benefits we have concluded that the solution should progress through the gated process to gate two, and that further funding be allowed.

We are not changing the funding of this solution. This solution's total allowance and gate allowances remain the same as the final determination.

We have decided to merge the gate one and gate two allowances. This results in a total allowance of £28.90m being available at gate two. Companies remain responsible for management of cost risk to meet gate requirements

4.2 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.

Our assessment of the efficient costs as spent on gate one activities results in an allowance for this solution of £1.53m (of £1.53m claimed). These costs represent final and reconciled costs.

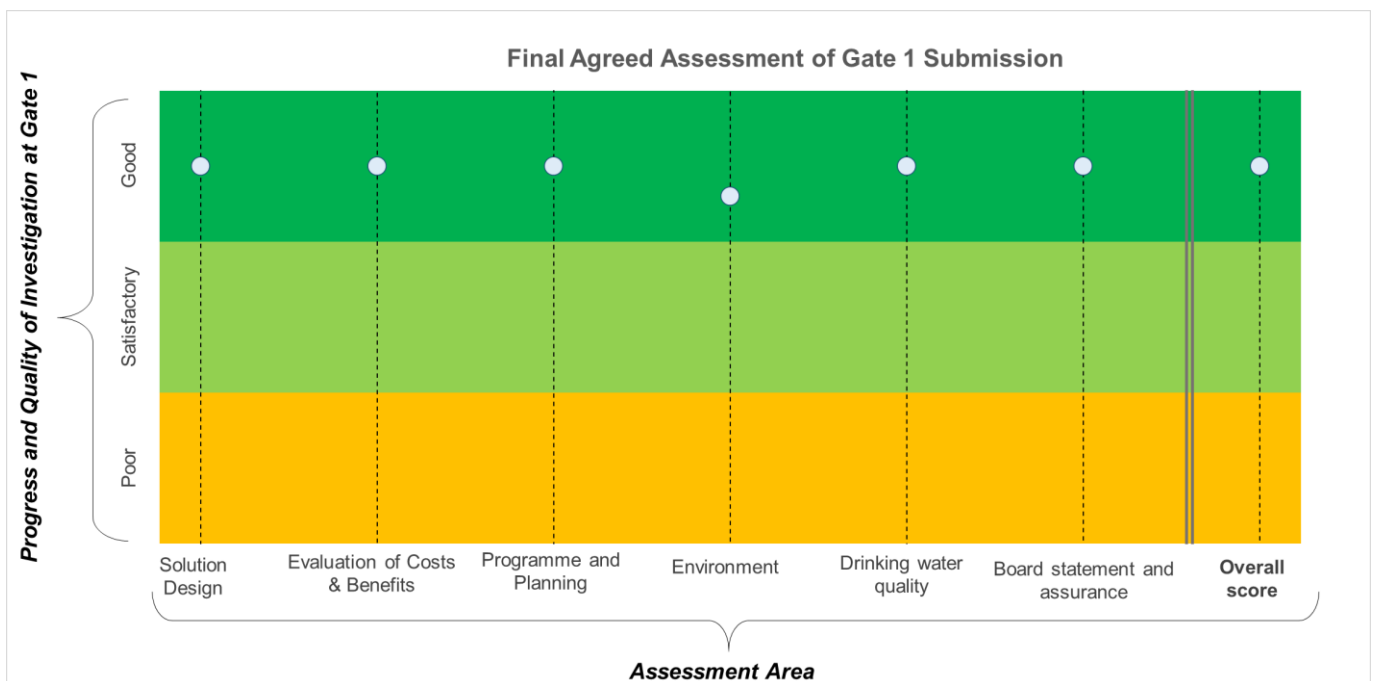
We have made no adjustments to the costs claimed.

4.3 Quality of submission

The aim of the assessment was to determine whether appropriate progress has been made towards delivery of the solution. We recognise at this stage solutions may be at different development points and the assessment takes this into account.

Error! Reference source not found.² shows our assessment of the work completed on the solution, which was presented in the 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 [guidance published on 22 February 2021](#).⁴ We also assessed the Board assurance provided.

Figure 2. Submission Assessment



Our overall assessment for the solution submission is that it is good (meets expectations).

4.3.1 Solution Design

Our assessment of the solution design considered the quality of the evidence provided on the initial solution and options; the anticipated operational utilisation of solutions; the interaction of the solution with other proposed water resource solutions and stakeholder and

⁴ <https://www.ofwat.gov.uk/wp-content/uploads/2021/02/Strategic-regional-water-resource-solutions-guidance-for-june-2021.pdf>

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 that the progress and quality of the investigation completed by Thames Water and Affinity Water in developing the solution design at gate one has been good, although we expect to see this expanded upon with more detail in the gate two submission. For gate two, the companies should also refine the preferred option and reassess and refine solution operational utilisation following the outputs of regional modelling.

4.3.2 Evaluation of Costs & Benefits

Our assessment of the evaluation of costs and benefits considered the quality of the information provided on initial solution costs; the societal, 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's evaluation of the costs and benefits of the solution for gate one has been good, although we expect to see this expanded upon with more detail in the gate two submission.

Natural capital assessments, and biodiversity net gain assessments need to be reassessed at gate two. Following outputs of regional modelling, wider benefits will need to be refined for the preferred option and the size and yield of the option will need to be confirmed.

4.3.3 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 that the progress and quality of the gate one investigation completed by Thames Water and Affinity Water regarding the programme and planning, risks and issues and the procurement and planning route strategy for SESRO has been good. Going into gate two, a full risk register should be shared with the Environment Agency to ensure a work programme is in place to address environmental risks.

4.3.4 Environment

Our assessment of environment considered the initial 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 that the progress and quality of the work presented in the gate one submission provided by Thames Water and Affinity Water regarding the environmental assessment, potential mitigations, future work programmes and embodied and operational carbon commitments has been good, but the submission evidence fell short of expectations in the area of environmental risks as the risk around landscape impacts and engagement with the Area of Outstanding Natural Beauty Board were not reflected in the submission.

In working towards gate two, sponsor companies should work with the Environment Agency and Natural England to ensure potential risks are addressed through a detailed work programme, including a review of the scope of monitoring and environmental assessment. Where impacts are identified appropriate mitigation should be investigated and agreed with environmental regulators.

4.3.5 Drinking water quality

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

We consider that the information provided in this submission on drinking water quality risks, stakeholder engagement and DWSPs for gate one was good. We expect to see further development of DWSPs, water quality monitoring, including for emerging contaminants, and wider stakeholder engagement with ongoing dialogue with the respective water quality teams in gate two.

4.3.6 Board Statement and assurance

The evidence provided relating to assurance has been assessed as good.

The solution sponsors have provided Board statements that indicate:

- their support of submission recommendations for solution / option progression;
- they are satisfied that progress on the solution is commensurate with the solution being construction ready for 2025–30;

- they are satisfied the work carried out to date is of sufficient scope, detail and quality as would be expected for a large infrastructure project of this nature at this stage; and
- that expenditure has been incurred on activities that are appropriate for gate one and is efficient.

These statements are accompanied by an explanation of the approach to assurance and a description of the evidence and information that the Boards have relied on in giving the statements.

5. Proposed changes to partner arrangements

There are no proposed changes to partner arrangements.

6. Actions and recommendations

Where the submission has not been assessed as ‘meeting expectations’ 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 gate two.

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 one 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 and for this reason directly relate to the assessment of delivery incentives set out in this publication. The response to the priority actions will determine whether a delivery incentive is imposed; and the extent to which the delivery incentives can be mitigated by the solution sponsors. If all priority actions are satisfactorily completed then the penalty will not be imposed. If one or more of the priority actions are not satisfactorily completed then the whole of the penalty will be imposed.

We have also identified actions that should be addressed in full in the gate two submission. The response to these actions will influence the assessment of the gate two submission.

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

No priority actions have been identified for SESRO, therefore we do not require the solution sponsors to provide us with a remediation action plan. The full list of other actions and recommendations can be found in the appendix.

7. Gate two activities

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

For its gate two submission, we expect Thames Water and Affinity Water to complete the activities listed in the [PR19 final determinations: strategic regional water resources solutions appendix](#) as expanded on in section 15 of its gate one submission.

8. Incentives for gate two

For gate two we maintain the same arrangements for incentives as applied in gate one – that is, a maximum penalty of 30% of company’s total efficient gate funding that could be applied to solutions that have not made adequate progress, where work is of inadequate quality, or the submission deadline is missed.

Penalties will be determined on a case by case basis taking into account:


- the level of completeness and the overall quality of the work carried out in investigating and developing the solution based on the evidence summarised in the submission;
- the evidence and justification provided where aspects of the work carried out fall short of expectations; and
- the impact on the decisions and delivery of solutions, including the extent to which deficiencies adversely impact customers.

Penalties will be applied through the PR24 reconciliation mechanism, as described in [‘PR19 final determinations: Strategic water resource solutions’](#).

There will be no opportunity to remediate deficiencies identified at the assessment in order to defer penalties.

Appendix: Actions and Recommendations

Actions – to be addressed in gate two submission		
Number	Section	Detail
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.
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.
3	Environment	Provide a landscape and visual impact assessment, the project team should engage with and work with the AONB Board on this.
Recommendations		
Number	Section	Detail
1	Solution design	Continue investigation of combined SESRO-STT modelling to determine any additional DO benefits and report on findings.
2	Costs & Benefits	Revise environmental findings of WRSE in-combination assessment
3	Costs & Benefits	Further investigate the DO conjunctive use benefits associated with the Thames to Affinity transfer (T2AT).
4	Costs & 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.
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.



Ofwat
Centre City Tower
7 Hill Street
Birmingham B5 4UA

Phone: 0121 644 7500
Fax: 0121 644 7533

© Crown copyright 2020

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3.

Where we have identified any third party copyright information, you will need to obtain permission from the copyright holders concerned.

This document is also available from our website at www.ofwat.gov.uk.

Any enquiries regarding this publication should be sent to mailbox@ofwat.gov.uk.

OGI