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Strategic regional water resource solutions: Accelerated gate one draft decision for additional solution, raw water transfer from Havant Thicket

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1. Introduction

The purpose of this publication is to set out our draft decision in respect of an additional strategic regional water resource solution (raw water transfer from Havant Thicket reservoir) proposed for the accelerated gate one assessment by solution sponsor, Southern Water.

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

The solution sponsors and other interested parties can now respond to the draft decision. Representations are invited by email to rapid@ofwat.gov.uk and the representation period will close at 5 pm on 31 December 2020. All representations will be considered before our final decision is published on 28 January 2021.

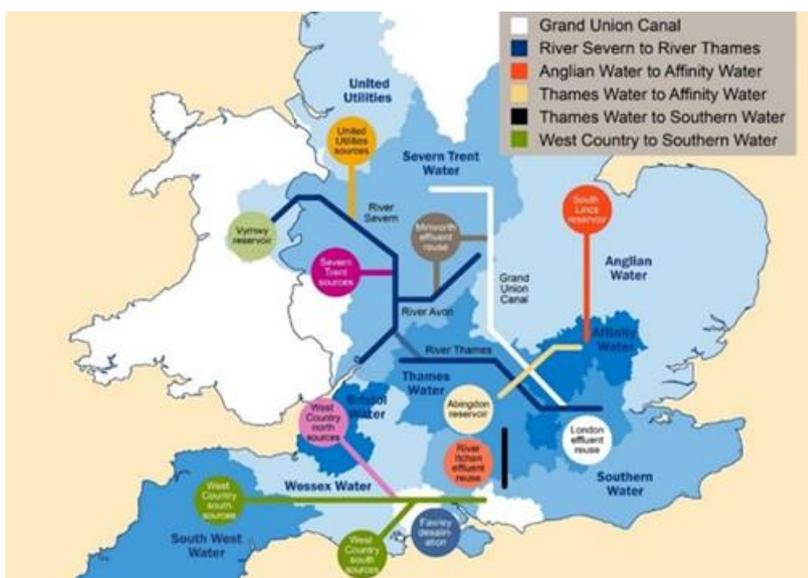
2. Background

In the final determination of its most recent price review (PR19) we intervened to allow up to £469 million for nine companies to jointly investigate and develop strategic regional water resource solutions during 2020–25¹. This funding is for accelerating investigations and feasibility enabling solutions to be ‘construction ready’ in 2025–30. Seventeen strategic solutions were identified for the initial stages of this process including eleven source development options and six water transfer options.

The strategic regional solutions pass through a gated process. The purpose of the gated process is to ensure at each gate that companies are progressing strategic water resource solutions for which funding was allocated at PR19, company costs incurred in doing so are efficient and that solutions merit continued investigation and development during the period 2020 to 2025. There are four gates in the 2020–25 period, the first two relating to design and investigations and the remaining two relating to planning activities.

Gate one activities relate to initial concept design and decision making. At this stage we recognise that solutions may be at different development points. Gate one is therefore regarded as a checkpoint in order to ensure progress is made and rectify any shortcomings prior to gate two. Gate two is a key decision point.

Figure 2.1 Potential strategic regional water resource solutions



¹ See <https://www.ofwat.gov.uk/publication/pr19-final-determinations-strategic-regional-water-resource-solutions-appendix/>

The PR19 total development allowance associated with each gate decision is split in the following proportions: gate one - 10%, gate two - 15%, gate three - 35%, gate four - 40%.

Decisions made at the gates are implemented through an end of period reconciliation mechanism, which was explained in our final determination.

Other solutions may be identified through the process, for example during the development of regional plans, and these can enter the gated process based on RAPID’s recommendations to us. They are subject to additional assessment further described in section 3. Solutions which enter the gated process are funded from the gate they enter; no funding is available for work done before they enter the programme. The raw water transfer from Havant Thicket reservoir is an example of one such proposed addition to the gated programme of strategic regional solutions.

There are two tracks in the gated process:

- standard gates, where timings align with other water resource planning processes; and
- accelerated gates, for solutions that address Southern Water’s need for large scale water resources, which occurs earlier than for other companies, in December 2027.

Figure 2.2 Gated process for potential strategic regional water resource solutions



3. Submission assessment process

Solution sponsors are required to complete a submission template for each strategic resource option. The submission template seeks to establish the progress of potential solutions.

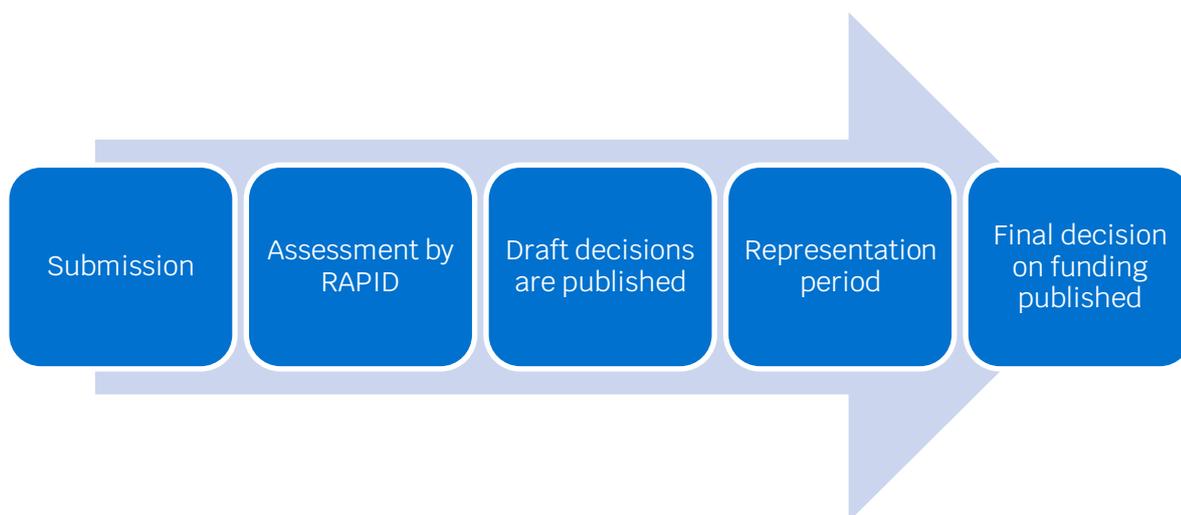
As this is a new proposed solution, we have assessed it against the following questions to allow us to decide whether the solution should be added to the programme.

- Is there value in accelerating the solution’s development to be ‘construction ready’ for the 2025–2030 period?
- Does the solution need additional enhancement funding for investigations and development?
- Does the solution need the additional regulatory support and oversight provided by the Ofwat gated process and RAPID?
- Does the solution provide a similar or better cost / water resource benefit ratio compared to current solutions?

For new proposed solutions, we also review the submission to determine if it is of sufficient quality and demonstrates that sufficient work has been carried out for this stage of the gated process. We provide a list of recommendations for its improvement and for gate two activities.

The assessment process takes place over a number of stages before draft and final decisions are reached, as illustrated below.

Figure 3.1 Submission assessment process



4. Solution background

4.1 Solution summary

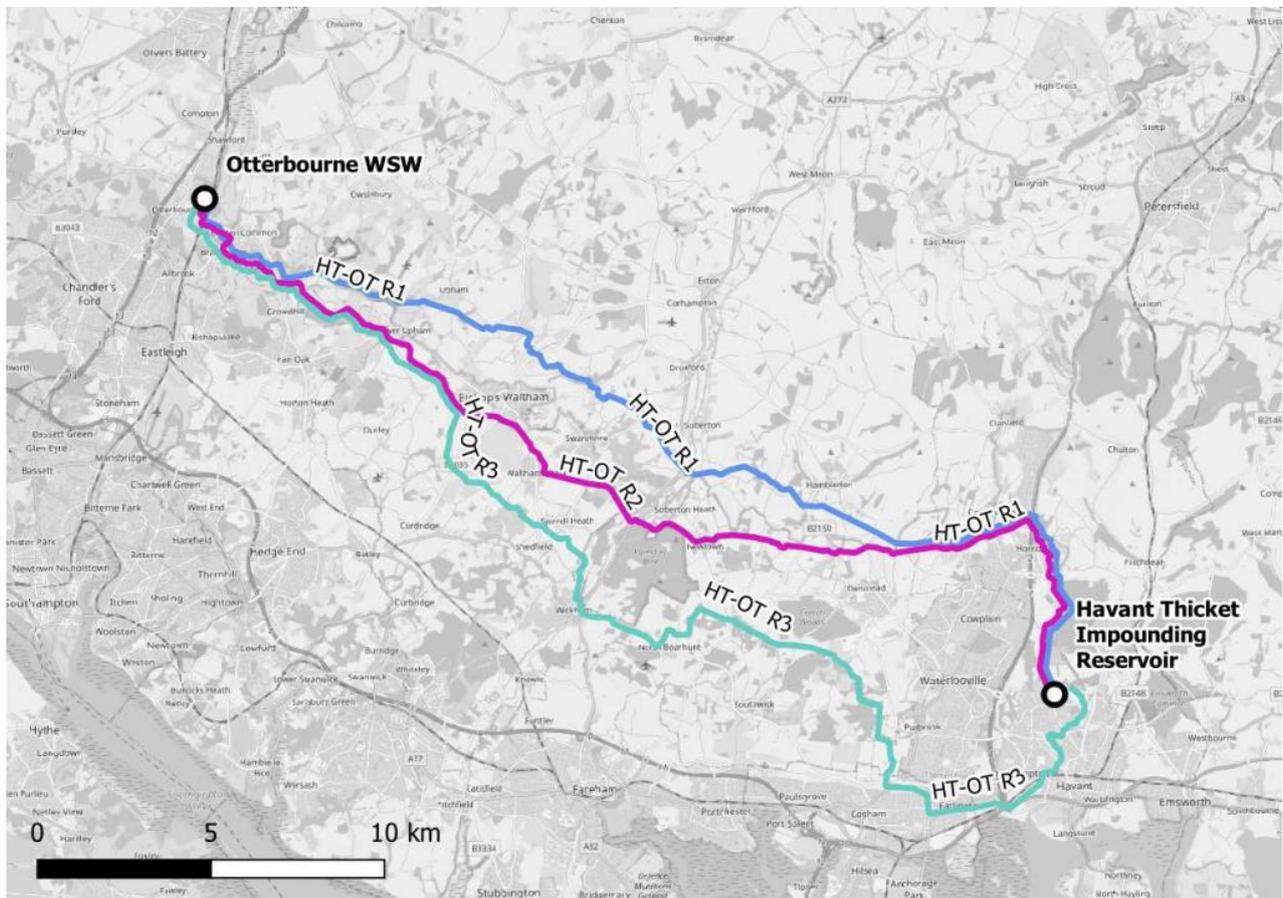
This additional solution proposes to make use of the storage in Portsmouth Water's proposed Havant Thicket reservoir to supply an additional 61Ml/d raw water transfer during drought in addition to the proposed 21Ml/d potable water transfer detailed in WRMP19.

The solution includes abstraction from the proposed reservoir, a new high-lift pumping station and around 40km pipeline to Otterbourne Water Supply Works (WSW). No specific options have been presented although three different pipeline routes are being considered.

The estimated development and capital costs for this solution are £176 million and the operating costs over the 60-year design period have been calculated as £19 million. The current capex, opex and carbon footprint estimates are significantly lower than any of the other solutions presented by Southern Water in the accelerated gate one submission.

This solution cannot deliver until the Havant Thicket reservoir has been constructed and filled. Southern Water estimates the earliest delivery date to be November 2028, and this assumes that the pipeline is constructed in parallel with the reservoir and that the earliest potential fill date for the reservoir is achieved.

Figure 4.1 Additional solution schematic



4.2 Solution context

The Section 20 agreement with the Environment Agency sets out how Southern Water will use “all best endeavours” to implement the long-term solution for alternative water resource in order to address deficits arising from reductions in the volume of water that can be abstracted on the River Test and River Itchen, which are reflected in changes to abstraction licences made in March 2019.

This will enable the company not to require drought orders and permits from the River Itchen and the Candover boreholes and only to require a drought order or permit from the River Test in extreme drought events (1 in 500 year drought severity) after the end of 2027.

Southern Water’s WRMP19 sets out the proposals to meet the section 20 agreement which include: a 75Ml/d desalination plant at Fawley; water efficiency and leakage reductions; new bulk supplies from Bournemouth Water (20Ml/d) and Portsmouth Water (9Ml/d); construction

of Havant Thicket reservoir and a further 21Ml/d bulk supply from Portsmouth Water; extensions to the existing water grid; and water quality schemes.

This solution is proposed by Southern Water as another potential option for addressing deficits arising from abstraction licence reductions on the Rivers Test and Itchen.

Southern Water concluded that, in the current hierarchy of its options assessment, this additional solution to transfer 61Ml/d of raw water from Havant Thicket reservoir provides the best value. In this context, Southern Water has defined ‘best value for customers’ as the “design, delivery and operation of an asset that protects the water supply to customers with as little negative impact as possible on them and their local environment, whilst meeting national, regional and corporate objectives and at the lowest cost that can balance these aims effectively.” Southern Water acknowledge that the criteria used to score the various solutions, and the weighting applied to them, do not reflect legal obligations under the section 20 agreement or wider issues relating to deliverability and risk.

4.3 Solution key risks and issues

Southern Water has identified the following key risk associated with this solution.

- There are multiple environmental and spatial constraints affecting the pipeline corridor from Havant Thicket reservoir to Otterbourne WSW. They include designated environmental areas, such as the River Itchen Special Area of Conservation, road and rail infrastructure crossings, and numerous spatial constraints.

5. Solution assessment summary

Table 5.1 Draft decision summary

Recommendation item	Additional solution (Havant Thicket raw water transfer)
Solution Sponsor	Southern Water
Is there value in accelerating the solution's development to be 'construction ready' for the 2025-2030 period?	Yes
Does the solution need additional enhancement funding for investigations and development?	Yes, as part of a collaborative solution with Portsmouth Water
Does the solution need the additional regulatory support and oversight provided by the Ofwat gated process and RAPID?	Yes
Does the solution provide a similar or better cost / water resource benefit ratio compared to current solutions?	Yes

Funding will be allowed at PR24 for the solution to join the accelerated gate 2 programme subject to confirmation by collaborating partners before the end of the representation period (ie, by 31 December 2020):

- that it is a collaborative solution with Portsmouth Water;
- that it will include an investigation of alternative mitigation options for the section 20 commitments – for example, whether the pipeline infrastructure can provide an interim option to deliver for 2027 until Havant Thicket reservoir can be used as the source; and
- that Option B4 (61 Ml/d Recycled water sent to Otterbourne via Havant Thicket Reservoir) will be closely aligned and considered in combination with this solution.

Additional ring-fenced funding is allowed for progressing this solution through to gate four with a total allowed development allowance of £5.110 million (for gate two to four activities). It will be shared equally between the solution sponsors, assumed to be Southern Water and Portsmouth Water, unless sponsors agree and notify RAPID of alternative cost sharing proportions before the end of the representation period. This funding is allowed in accordance with the conditions and requirements as outlined in the PR19 final determinations: Strategic regional water resources solution appendix.

Remediation issues are listed in the Appendix to help improve the submission for gate two.

5.1 Solution progression and funding to gate two

This solution has been presented to RAPID at a late stage before the accelerated gate one and the detail is not as well developed as for Southern Water's other solutions. However, the current capital cost estimate, at £176 million, is significantly less than the cost of the other solutions. In addition, the carbon and environmental impact appear significantly lower and it relies on a more familiar drinking water treatment technology (therefore reducing technical risks).

We conclude that there is value in accelerating the solution development subject to further feasibility assessment. In particular, we believe that there may be value in accelerating the pipeline construction and investigations of its alternative use until Havant Thicket reservoir is operational, as a potential mitigation measure for the section 20 commitments. The long pipeline route is potentially crossing through sensitive areas which would also benefit from joint regulatory oversight.

This option has not been funded as enhancement investment as part of Southern Water’s 2020–25 business plan and we believe it would benefit from additional enhancement funding. Southern Water has benchmarked the developmental costs against similar long-distance pipelines included in the RAPID process and is proposing a total development cost of £5.110 million to progress activities in gates two to four. The gate allowances for this additional solution are as follows:

Table 5.2 Additional raw water transfer allowances

	Gate one	Gate two	Gate three	Gate four	Total
Raw water transfer – total development allowance, £m (2017–18 prices)	N/A *	1.128	1.859	2.124	5.110

* Company submission states that approximately £200,000 was spent from company wholesale totex on the development up to gate one.

We have not accepted Southern Water’s proposal that funding for this solution be reallocated from within the funding for desalination and water recycling solutions for which funding was allocated in our final determination. The development allowance for this raw water transfer is new separate ring-fenced funding and is subject to the same conditions and requirements as outlined in the PR19 final determinations: Strategic regional water resources solution appendix. This is because Southern Water’s proposal assumes that the additional solution will be Southern Water’s own; whereas we propose that it is developed jointly with Portsmouth Water. Separate funding will allow more transparency in reporting.

Given that the solution relies on an asset built by Portsmouth Water, it will only merit the additional regulatory support and oversight if it is confirmed as a collaborative solution with Portsmouth Water. Southern Water should also consider the merits of wider collaboration (for example, with South East Water and/ or with other water using sectors) if there are likely to be regional benefits.

The current cost estimates presented by Southern Water suggest that this solution provides better value for money than the company’s other solutions. The company’s multi-criteria decision analysis (which took into account alignment to national, regional and corporate objectives, delivery and operational risk, and impacts on the environment and stakeholders)

places the solution at the top of its hierarchy of options. However, this solution is not as advanced as the other accelerated gate one solutions, and there is a risk that the cost estimates could inflate as the solution investigations progress.

Southern Water proposes that RAPID decides at gate two which solution/option should be progressed further. We clarify that the recommendation for which solution(s) and option(s) should progress beyond gate two is for Southern Water to make, based on the outcome of the assessments completed by that stage. The role of RAPID is to endorse or challenge the recommendation based on the strength of evidence presented.

5.2 Assessment of completeness and quality

The aim of the assessment is to determine whether appropriate progress has been made towards delivery of the solution. We assessed to what extent the activity has been completed (completeness) and whether the evidence provided was reliable and consistent (quality). We recognise at this stage, solutions may be at different development points and the assessment takes this into account.

In line with the guidance published to companies on 1 June 2020 (and updated on 7 September 2020) we made this assessment against the criteria of:

- solution design;
- costs and benefits;
- risk and programme management;
- consistency and context; and
- assurance and board engagement.

For each criterion we assessed whether or not the submission ‘Meets expectations’, ‘Falls short of meeting expectations in some areas’, ‘Falls short of meeting expectations in many areas’ or is ‘Unacceptable’ before concluding on an overall assessment as part of the gate one decision.

Our overall assessment for the solution submission is that it “Falls short in some areas”, as illustrated in Figure 5.1. We acknowledge that this solution is at a relatively early stage in its development.

Further details of our assessments are provided below.

Figure 5.1 Assessment of completeness and quality

Overall:	Falls short in some areas
Completeness:	Falls short in some areas
Solution design:	Falls short in some areas
Costs and benefits:	Falls short in some areas
Risk & Prog. management:	Falls short in many areas
Consistency & context:	Falls short in some areas
Assurance & board engagement:	Meets expectations

Completeness

Some elements of the submission are missing or are partially complete; for example, the extent of water resources modelling that has been completed to determine the benefit for this option is less than the other solutions; evidence around the potential social, environmental and economic benefits that the solution could deliver is limited; and there is no consideration of solution delay impacts.

Solution design

We have included in our assessment of solution design the solution description and technical information about the solution and its water resource benefits.

There is a reasonable level of detail regarding the configuration of the option but detail regarding how the option will operate in different scenarios is lacking. In addition, no alternate options were presented for this solution. Investigations in advance of the gate two submission should include alternative mitigation options for the section 20 commitments - for example, an alternative use of the pipeline.

The evidence base for the viability of this option is not clearly presented - Havant Thicket reservoir has been designed to provide a 21Ml/d supply for Southern Water and it is not clear whether the option to provide an additional 61Ml/d during drought is realistic. It is understood that there is ongoing water resource modelling work to support this option. This

work will need to be reviewed with the Environment Agency to understand whether this is a viable option and this will need to be presented as part of the gate two submission

Evaluation of costs and benefits

Our assessment of the evaluation of costs and benefits considered information provided about the costs of the solution, the social, environmental and economic assessments and how the solution takes into account the carbon challenge.

The main submission and related annexes provide detailed breakdowns and evidence that the costs have been developed in accordance with appropriate methodologies including the Green Book. Benchmarking data is presented in an annex and this data indicates that the current solution capital costs are reasonable and, overall, likely to be efficient. There are still significant areas of scope and cost uncertainty but the current optimism bias allowance is intended to cover such uncertainty at this stage.

No environmental or social benefits have been identified in the submission other than “the provision of a secure water source”. Carbon emissions estimates (embodied, operational and whole life carbon estimates) have been evaluated using appropriate approaches at this stage.

All areas of environmental assessment need to be developed further to progress feasibility and viability of options.

Risk and programme management

Our assessment of risk and programme management has considered information relating to the outline project plan, planning considerations, key risks and mitigation measures, drinking water quality considerations and proposed gate two activities and outcomes.

Our assessment is that risk and programme management falls short in many areas.

Southern Water has stated that the delivery of the solution will not be by the end of 2027 (which is the date referenced in the section 20 agreement). The programme sets out key milestones but does not clearly identify the cause of the delay or the mitigation measures needed to bring the completion date forward.

Areas of uncertainty are identified, though not in sufficient detail, and proposals to manage or mitigate any uncertainties are not clearly stated.

Clarity is lacking on plans for the regulation 15 assessment of raw water quality, and therefore appropriate treatment processes for this water. Implications of this solution on the ongoing

refurbishment at Otterbourne WSW should be identified and discussed with the Drinking Water Inspectorate.

Consistency and context

Our assessment of consistency and context has considered information relating to the interaction of the solution with other solutions, an explanation of how this solution will meet the requirements set out in the National Framework and regional plans and a comparison of the costs and benefits of this solution with those of other solutions. Information regarding stakeholder engagement has also been taken into account in our assessment.

Our assessment is that consistency and context falls short of meeting expectations in some areas.

In its submission, Southern Water presents this solution as an alternative option to the base case desalination option, should the desalination option prove not to be deliverable. However, Southern Water has also stated that the delivery of this solution will not meet the section 20 commitment.

The dependencies and any issues are not clearly defined. This option as currently presented relies on Havant Thicket reservoir which is under development and will also rely on reaching an operating agreement with Portsmouth Water should it progress as an option.

The level of stakeholder engagement on this new solution is very low. Of most concern is the apparent low engagement to date with Portsmouth Water. The stakeholder/customer engagement evidence presented is very brief and has been presented as a high level generic assessment copied across all of the Southern Water submissions (desalination, recycling and Havant Thicket). More work is required to better understand customer acceptability and improve stakeholder engagement.

There are a number of quality issues with inconsistent references, apparent cut and paste errors and poor resolution maps on which to make an assessment. Although we do not make specific recommendations in the remediation plan, we would like to see an improved attention to detail in gate two submission.

Assurance and Board engagement

The main submissions and associated annexes and appendices contain a suitable level of detail concerning the internal and third party assurance processes adopted. The documents cover approach, roles/responsibilities, governance, board assurance statements, timetables, risk assessment information and individual summaries from each external assurance

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

The submission contains sufficient information covering how the board was involved, assurance statements and signed endorsements. Information on future plans for board engagement would improve the submission.

We expect Southern Water's Board to provide effective oversight of Southern Water's obligations under the section 20 agreement and to ensure that one or more solutions are in place and operating by the end of 2027. These solutions must secure sufficient alternative water resource such that the company no longer requires drought orders and permits from the River Itchen and the Candover boreholes and only requires a drought order or permit from the River Test in extreme drought events (1 in 500 year drought severity) after the end of 2027.

Future plans for board engagement must provide for this oversight by Southern Water's Board. We expect Southern Water's Board assurance for gate two to include a statement that the Board is satisfied that progress on solutions is commensurate with solutions being in place and operating by the end of 2027.

5.3 Proposed changes to partner arrangements

Although Southern Water states in its submission that Portsmouth Water is a critical partner in the development of this solution, the solution was not submitted as a collaboration. It is a concern that the option has not been presented as a joint solution with Portsmouth Water.

For the solution to be funded to gate two as part of the accelerated gate track we require that it is progressed as a collaborative solution.

5.4 Actions and recommendations

The submission has been assessed as 'Falling short in some areas'. We have provided feedback on where we will seek remediation of the issues.

In order for the solution to be added to the accelerated track programme, we require confirmation of the following from Southern Water and Portsmouth Water, by the end of the representation period (31 December 2020).

- The solution will be progressed as a collaboration between the two companies.

- That it will include an investigation of alternative mitigation options for the section 20 commitments – for example, whether the pipeline infrastructure can provide an interim option to deliver for 2027 until Havant Thicket can be used as the source.
- That Option B4 (61 Ml/d Recycled water sent to Otterbourne via Havant Thicket Reservoir) will be closely aligned and considered in combination with this solution.

A timetable of regular review points with regulators showing how the project will be progressed between gates one and two should be provided by 31 March 2021.

Funding allowed for gate two activities is £1.128 million. It will be shared equally between the solution sponsors unless sponsors agree and notify RAPID of the cost sharing proportions before the end of the representation period.

We have identified actions that require remediation in full in gate two submission. The response to these actions will influence the assessment of gate two submission.

We also offer a number of recommendations. These are issues where additional information or clarification could improve the quality of future submissions. All actions and recommendations are listed in the Appendix.

6. Gate two activities

For its accelerated gate two submission, we expect Southern Water to complete the activities listed in [PR19 final determinations: strategic regional water resources solutions appendix](#), as expanded on in its gate one submission Annex 20. Activities we consider to be of particular importance are listed as actions in the Appendix.

7. Next steps

Following publication of this gate one draft decision solution sponsors and other interested parties are invited to respond to the draft decision. Representations can be made by email to rapid@ofwat.gov.uk and will close at 5pm on 31 December 2020. All representations will be considered before our final decision is published on 28 January 2021.

Appendix: Remediation issues

Priority actions – to be addressed as a matter of priority		
No	Section	Detail
1	2.9, 13.1	<p>Southern Water and Portsmouth Water to confirm the following jointly, by the end of representation period (31 December 2020).</p> <ul style="list-style-type: none"> The solution will be progressed as a collaboration between the two companies Funding allowed for gate two activities is £1.128 million. It will be shared equally between the solution sponsors unless sponsors agree and notify RAPID of the cost sharing proportions before the end of the representation period. The activities to gate two will include investigation of alternative mitigation options for the s20 commitments, for example (but not restricted to) an alternative use of the pipeline in advance of the reservoir completion. Option B4 (61ML/d Recycled water sent to Otterbourne WSW via Havant Thicket Reservoir) will be closely aligned and considered in combination with this this solution. <p>A timetable of regular review points with regulators showing how the project will be progressed between gates one and two should be provided by 31 March 2021.</p>
Actions – to be addressed in gate two submission		
No	Section	Detail
1	2.1, 2.2, 2.5, 2.8, 2.9, 4.3	Provide a 'conceptual design report' developed in consultation with all regulators, to meet gate two requirements and timescales. Include a recommendation for which solution should progress beyond gate two, based on the outcome of the assessments completed by that stage.
2	2.3 (and relates to many other sections)	Undertake site selection process for the preferred pipeline configuration as detailed in Annex 9.1 and 9.2 in consultation with the Environment Agency and Natural England, to meet gate two requirements and timescales.
3	2.5	<p>Agree the results of collaborative water resources modelling that indicates the alternative raw water proposal for Havant Thicket will be able to support the 61ML/d drought requirements in addition to the 21ML/d supply currently included in WRMP19 with the Environment Agency. This should include consideration of a 1 in 200 and 500 year drought.</p> <p>Confirm how this option will operate during different drought scenarios, alongside the 21 ML/d WRMP19 solution and any operational requirements.</p>
4	2.6, 5.1, 5.3, 5.4	Provide summaries of the further development of Strategic Environmental Assessment, Habitats Regulations Assessment, Water Framework Directive assessment, Natural Capital Assessment, Environmental Social and Economic Valuation and Environmental Net Gain,

		that have been discussed and agreed with the Environment Agency and Natural England, to meet gate two requirements and timescales.
5	3.1	Explain how this proposed alternative raw water transfer option can support delivery of alternative water resource by the end of 2027 (as referenced in timing requirements of the section 20 agreement). This should include exploring the abstraction implications of different options, including comparisons of environmental impacts of an interim solution that uses the pipeline and pumping infrastructure with those of desalination and recycling. Provide further detail on pre-construction activities required, highlighting critical paths and demonstrating greater focus on the potential constraints that environmental designations could bring to the pipeline corridors.
6	3.3	Consider whether your WRMP19 needs amending and if so how. Explain the reasoning for this in light of potential changes to your Best Value plan, delivery times and costs.
7	4.3	Provide a summary of the potential impact that the solution could have on Southern Water and Portsmouth Water's supply-demand balances. This should also include the impact on any current options or programmes within the WRMP19 or AMP7.
8	5	Clarify plans for the regulation 15 assessment of raw water quality, and therefore appropriate treatment processes for this water.
9	5	Otterbourne WSW site is currently the subject of a legal instrument to carry out significant refurbishment works. The DWI has already amended the legal instrument, delaying some of the work, to take account of the strategic resource options at this site. Implications of this solution on the ongoing refurbishment at Otterbourne WSW should be identified and discussed with the Inspectorate.
10	5.1, 5.2, 5.3, 5.4	Provide details of an 'Evidence Planning Strategy', which has been discussed and agreed with the Environment Agency and Natural England, to meet gate two requirements and timescales. Baseline methodologies and scopes to inform survey work needs to be agreed as a priority.
11	6	Undertake a procurement strategy assessment including DPC eligibility assessment. Include in this assumptions with respect to who would operate the solution under both the DPC and traditional delivery model.
12	8.4	Provide more information about stakeholder engagement and the understanding of customer acceptability including: <ul style="list-style-type: none"> • for individual solutions and options; • on issues that could cause delay; and • how the views of vulnerable or harder to reach stakeholders and customers will be sought.
13	9.1	Develop a fuller risk assessment that explores the areas of uncertainty associated with this solution. This should include: <ul style="list-style-type: none"> • a clearer relationship between mitigation measures and residual risks; • greater clarity on the scoring criteria applied; and • direct read-across to the dashboard risks.

14	14.1	Future plans for Southern Water's board engagement must provide for effective oversight of Southern Water's obligations under the section 20 agreement and to ensure that one or more solutions are in place and operating by the end of 2027. We expect Southern Water's Board assurance for gate two to include a statement that the Board is satisfied that progress on solutions is commensurate with solutions being in place and operating by the end of 2027.
15	14	Provide total gate expenditure and activity breakdown costs in a common cost base. These costs should be presented in 2017-18 prices.
Recommendations		
No	Section	Detail
1	2.10	Provide further information about how this solution will meet the National Framework and WRSE requirements and explore the wider resilience benefits this solution could bring.
2	4.2	Please clarify what factors are included in the final out-turn cost adjustment included in the indirect capex estimates and whether there is any double counting of allowance for cost uncertainty included under the risk assessment and optimism bias assessment.
3	4.2	Correct the inconsistency confirmed in clarification response (SRN020 Western Grid Minimum Flows) to demonstrate that option operating costs are calculated correctly for different operating scenarios and therefore options are being compared consistently.
4	4.2	To aid comparison with other WRMP options provide the Average Incremental Costs (AIC). Please clarify why 60 years has been used for opex and whole life cost calculations. It is noted that the Water Resources Planning Guideline (WRPG) recommends that costs are profiled over at least the next 80 years.
5	5.8	Provide both operational carbon emissions and carbon intensity using the same throughputs as used for the opex and whole life cost per m3 presented in Annex 12 (i.e. as a whole life carbon per m3 or Ml using the expected flows over 60 years). The expected flows used in both cost and carbon analysis should be consistent with the flows stated in Annex 7. Include a clarification of whether operational carbon emissions calculations take into account the future decarbonisation of the power grid.
6	7.1	Provide further detail on the planning risks and the planned mitigation measures.
7	12.1	External reviews appear focused on working versions rather than final versions. A challenge log or compiled assurance findings could clarify what issues the external assurance providers flagged and how they were resolved. Information on future plans for board engagement and a compiled summary/log of assurance findings with actions taken to address would also improve future submissions.
8	12.1	Provide information on future plans for board engagement and a compiled summary/log of assurance findings with actions taken.
9	14.1	Provide a breakdown of costs to gate two that is consistent with the scheduled activities for gate two, demonstrating the efficiency of expenditure.

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

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