

Strategic Solution Gate 1 Submission: Preliminary Feasibility Assessment Additional Solution Proposal

28 September 2020



Contents

1	Executive Summary	3
2	Solution Description	4
2.1	Outline of the Solution	4
2.2	Configurations and Options Considered	4
2.3	Diagrams and Schematics	5
2.4	Overall Costs	5
2.5	Resource Benefit	5
2.6	Summary of Social, Environmental and Economic benefits	6
2.7	Drinking Water Quality Considerations	6
2.8	Wider Resilience Benefits	6
2.9	Description of Interaction	7
2.10	Meeting National Framework Requirements	7
3	Outline Project Plan	7
3.1	Delivery Schedule	7
3.2	Schedule Assumptions	9
3.3	Critical Path	10
3.4	Programme Progress	10
3.5	Information Status and Plan	10
4	Technical Information	11
4.1	Option Configuration	11
4.2	Site Plan	13
4.3	Operations and Maintenance Considerations	13
5	Environmental and Drinking Water Considerations	15
5.1	Strategic Environmental Assessment (SEA) and Habitat Regulations Assessment (HRA) appraisals	15
5.2	Water quality considerations	18
6	Procurement and Operational Strategy	20
6.1	Procurement	20
6.2	Asset Utilisation	21
7	Planning Considerations	22
7.1	Preferred Planning Route	22
7.2	DCO Planning Steps	23
8	Stakeholder Engagement	24
8.1	Customer and Stakeholder Complexity Views	24
8.2	Engagement with regulators	25
9	Key Risks and Mitigation Measures	25
10	Cost and Benefit	27
11	Impacts on Current Plan	31
11.1	Supply demand balance impact	31
11.2	National Framework and regional plan requirements	31
12	Assurance	32
12.1	Assurance Process	32
12.2	Board Assurance Statements	33
13	Solution or Partner Changes	34
13.1	Portsmouth Water Collaboration	34
14	Efficient spend of gate allowance	34
14.1	Forecast spend to Gate 2	34
15	Proposed Gate 2 activities and outcomes	34
15.1	Design Activities	34
15.2	Environmental	35
15.3	Planning	35
15.4	Stakeholder Consultation	35
15.5	Legal and Commercial Considerations	35
15.6	Procurement	35
15.7	Cost Management	35
15.8	Schedule Management	36
	Appendix A: Submission of New Solution – Response to Questions Raised by RAPID	37

Please refer to Annex 21 Submission Navigation and Glossary for the glossary of terms, definitions and abbreviations for this PFA

1 Executive Summary

Strategic Challenge	This Preliminary Feasibility assessment (PFA) describes work undertaken to develop an alternative option to the Base Case in response to RAPID's request to Southern Water (SW) as part of the Water for Life Hampshire (WfLH) programme.											
What SW has done to date	<p>Further to the Preferred Strategy in WRMP19, which is backed by the s.20 agreement, SW is working with Portsmouth Water (PW) on the Havant Thicket Reservoir (HTR). PW will build and operate the reservoir and SW will pay for it. The reservoir will support a new bulk supply agreement of 21 MI/d of treated water delivered via PW's network.</p> <p>This PFA presents [redacted] (Option D.2) and considers a wide range of factors that influence the feasibility of the option including technical engineering, environmental impact, procurement, customer and stakeholder engagement, schedule, regulatory compliance, cost / benefit realisation and engagement with relevant partners.</p>											
Key findings	<ul style="list-style-type: none"> • [redacted] • [redacted] • [redacted] • [redacted] • [redacted] • Is proposed to be progressed and further considered post Gate 1 to further assess and determine option feasibility. 											
Key risks & assumptions	<ul style="list-style-type: none"> • [redacted] 											
Hierarchy of options when considered against a 'Best Value for Customers'	<p>The hierarchy of Options assessment considers a wide variety of factors against best value to SW customers. See Section 10 for more detail.</p> <table border="1" data-bbox="311 1478 1452 1590"> <thead> <tr> <th data-bbox="311 1478 459 1545">Solution</th> <th data-bbox="459 1478 885 1545">Hierarchy rank – Desalination only</th> <th data-bbox="885 1478 1189 1545">Overall Hierarchy position</th> <th data-bbox="1189 1478 1452 1545">NPV (£M)</th> </tr> </thead> <tbody> <tr> <td data-bbox="311 1545 459 1601">[redacted]</td> <td data-bbox="459 1545 885 1601">[redacted]</td> <td data-bbox="885 1545 1189 1601">[redacted]</td> <td data-bbox="1189 1545 1452 1601">[redacted]</td> </tr> </tbody> </table>				Solution	Hierarchy rank – Desalination only	Overall Hierarchy position	NPV (£M)	[redacted]	[redacted]	[redacted]	[redacted]
Solution	Hierarchy rank – Desalination only	Overall Hierarchy position	NPV (£M)									
[redacted]	[redacted]	[redacted]	[redacted]									
Alignment with Qtrly reporting dashboard	Option D.2 has not previously been reported via quarterly reporting. Should this Option be taken forward, it will be added to the reporting dashboard.											
Document maturity	The desalination solution (A.1) remains the Base Case which SW is obligated to use its all best endeavours to deliver. This PFA is an interim step in determining the feasibility and viability for other solutions to bridge the water supply-demand deficit across the Hampshire region, if this should be required. The Gate 1 milestone is broadly aligned with the Strategic Outline Case (SOC) stage of the business case development process detailed in the HM Treasury's Green Book ¹ and assesses a Long List of options. Should desalination prove to be undeliverable, this Solution could be one of the Options that is considered as an alternative. More detailed analysis will be completed post Gate 1 as Gate 2 activities.											

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/190609/Green_Book_guidance_shor_t_plain_English_guide_to_assessing_business_cases.pdf



2 Solution Description

2.1 Outline of the Solution

[REDACTED] This option addresses 61MI/d of the projected supply-demand deficit (i.e. equivalent in size to the desalination or water recycling solutions after the potential reduction in the deficit, as detailed in Annex 2 WRMP and Supply Demand Balance Risk Assessment).

Option D.2 is designed to operate concurrently with, but independently to, the planned 21 MI/d treated water transfer from the reservoir via Gaters Mill to SW's distribution network. [REDACTED]

For clarity, [REDACTED] in line with that detailed in Water Resource Management Plan 2019 (WRMP19). Modelling completed to date has confirmed that sufficient yield exists in Bedhampton Springs and the reservoir to feed PW and Southern Water demands up to a 1-in-200-year drought event.²

2.2 Configurations and Options Considered

As noted above, PR19 Final Determinations included desalination, indirect effluent reuse via the River Itchen (or Recycling) and West Country Sources North within the accelerated gates.

For desalination, PR19 Final Determinations required at least three size options to be considered in the concept design development. The constrained list of options included for the desalination solutions capacities of 75 MI/d, 61 MI/d and 40 MI/d, as detailed in the Submission Summary.

Whilst PR19 did not require consideration of a particular number of alternative solutions in relation recycling, the consideration of alternatives is important in order to inform a number of key assessments both for the Gated process and for the later planning and consenting process, and represents proactive risk management to ensure that SW's supply obligation can be met. As a result, the constrained list of options included a significant number of water recycling solutions.

In addition, the constrained list of options included four solutions relating to West Country Sources North. These options were not included in Appendix 6 of the SW WRMP19 and were a new opportunity considered as part of the PR19 Final Determinations.

Finally, the constrained list also included some hybrid solutions, considered to be an appropriate risk management measure and helpful for a proper consideration of alternatives for the purposes of SEA, HRA and WFD. The constrained list therefore included four potential hybrid options for consideration that built upon the unconstrained list of options in Appendix 6 of WRMP19.

Through the SW Asset Life Cycle Process the constrained list was refined to a Long List of ten solutions capable of addressing the supply-demand deficit identified in WRMP. The initial steps, and interim design developments, of the ALP were used in the development of the constrained list and those included on the Long List for Gate 1.

This process generated a list of ten Options, which includes Option D.2. Further detail as to the Options Appraisal process is provided within Section 10 and Annex 18 Option Hierarchy Development.

For consistency with the terminology used in PR19 Final Determinations and the RAPID Strategic Solution Accelerated Gate 1 Submission: Initial Concept Design template, these alternatives are described as, for

[REDACTED]

example, 'Option A.1' or 'Option A.2'. However, because SW is using all best endeavours to deliver the Base Case, these are seen as strategic alternatives as described above, rather than 'options' as such.

Table 1 - Summary of desalination options considered and analysed,

Configuration Type	Option No.	Solution Name	Solution Description	Proposed in WRMP19
Alternatives	D.2	A combination of 40 MI/d Desalinated water to a large coastal industrial facility with additional flows from recycled water	[REDACTED]	✘

2.3 Diagrams and Schematics

High-level schematics and process flow diagrams are detailed in Section 4.

2.4 Overall Costs

2.4.1 Construction and Operation Costs

Initial cost estimates (detailed in Table 2) have been developed. The Whole Life Cost (WLC) has been estimated using PR19 rates from 2017/18, however, as required by the HM Treasury Green Book², the capital expenditure (CAPEX) has been adjusted to suit the current maturity using optimism bias (OB). Both CAPEX and operational expenditure (OPEX) have also been discounted using a Net Present Value (NPV) approach. NPV has been assessed in accordance with a four-year construction period and sixty-year period of operation.

Table 2 details the class 4 Association for Advancement of Cost Engineering (AACE) estimates developed to date based upon the current concept level of design. Further detail regarding the approach taken in preparing the cost estimates is provided in Section 4.3.4 and Annex 12 Cost Report.

Table 2 – Summary of costs: Desalination options

Option	CAPEX (£m)	OPEX (£m) (60 years)	WLC (£m)	NPV (£m)
D.2	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

2.4.2 Costs to each gateway

Costs incurred to date and expected costs to be incurred through each stage of the RAPID process to determine the feasibility of Option D.2 are detailed in Table 3. Further detail is provided in Annex 20 Gate 2 Activity Plan and Annex 19 Efficiency of expenditure.

Table 3 - Expected costs for developing feasibility through RAPID accelerated gate process

	Gate 1 (£m) Actual Spend	Gate 2 (£m) Forecast	Gate 3 (£m) Forecast	Gate 4 (£m) Forecast	Total (£m) Forecast
Common Cost Base	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

2.5 Resource Benefit

Delivery of Option D.2 would provide a water resource benefit to the HRWZ and the South-East region as whole, bridging the water-supply deficit in the event of a 1-in-200-year drought event. [REDACTED]

2.6 Summary of Social, Environmental and Economic benefits

Inherent opportunities for social, environmental and economic benefit realisation are limited, with material benefits needing to be specifically designed into the options through the project lifecycle. Further detail of the potential opportunity for social, environmental and economic benefit realisation from each option is detailed in Section 5.2.2.4 (for Options A.1 and A.2) and Section 5.3.2.3 (for Option D.1).

2.7 Drinking Water Quality Considerations

SW has engaged with and continues to engage with the DWI to ensure water meets drinking water standards and to develop a comprehensive Drinking Water Safety Plan (DWSP). Public perception regarding the 'acceptability' of water from a recycled source and other stakeholder management requirements related to water quality need to be managed closely, as is detailed further in sections 5.2 and 8.

2.8 Wider Resilience Benefits

The primary benefit of Option D.2 is to increase the resilience of SW water supply sources up to a 1-in-200-year drought scenario. Initial resilience considerations in relation to alignment to SW's '4Rs of Resilience' framework, are detailed in Section 5.1.3.3. SW has extracted the key resilience requirements from the RAPID Accelerated Gate 1 Submission template and aligned this with SW's interpretation of resilience criteria as detailed in Table 4

Table 4 - SW's interpretation of RAPID resilience guidance

Key principles extracted from the RAPID Accelerated Gate 1 Submission template	Interpreted set of Resilience Criteria
<ul style="list-style-type: none"> Description of the interaction of this solution with other proposed water resources solutions. 	<ul style="list-style-type: none"> Integration with existing network strengthening solutions / plans
<ul style="list-style-type: none"> The extent to which the solution is designed to operate during times of peak demand. 	<ul style="list-style-type: none"> Adaptability of operation / Emergency response in a stressed situation (e.g. peak week demand)
<ul style="list-style-type: none"> Resource benefit of the solution and its potential conjunctive use benefit. Drinking water quality considerations. 	<ul style="list-style-type: none"> Environmental Impact (water resource benefit)
<ul style="list-style-type: none"> Explanation how this solution will meet the requirements set out in the National Framework and regional plan. 	<ul style="list-style-type: none"> Future adaptation for growth
<ul style="list-style-type: none"> Wider resilience benefits, including those for other sectors – for example, benefits from reduced flood risk. 	<ul style="list-style-type: none"> Regional Resilience

Each [redacted] option has been assessed against the 4Rs of Resilience, the results are summarised in Table 5 and detailed in Section 3 Annex 17 Alignment to Southern Water Resilience Plan.

Table 5 - Resilience assessment – Option D.2

Resilience Criteria	Assessment
Integration with existing network strengthening solutions / plans	Option D.2 can be well integrated with the existing network via a single point (Otterbourne WSW inlet). This is not without challenge but is relatively straightforward as compared to other solutions. A further benefit is that Option D.2 has a single point of abstraction and has no cross connectivity with the network from abstraction to discharge at Otterbourne.
Adaptability of operation / Emergency response in a stressed situation	Option D.2 offers good adaptability of operation in an emergency response. However, the eventual operational protocol of this asset will influence this: <ul style="list-style-type: none"> [redacted] [redacted] [redacted]
Environmental impact (water resource benefit)	[redacted]

Resilience Criteria	Assessment
Future adaptation for growth	If planned at the outset, option D2 offers significant opportunity for future growth (for example the pipeline and pumping station could be configured) to accommodate future flow volumes. [REDACTED]
Regional Resilience	Option D.2 in itself is of moderate benefit from a regional resilience perspective as it only benefits SW, however, it is an enabler to a further possible option, Option B.4, which has the potential to offer significant regional resilience as it could become a solution that both PW and SW can potentially draw on.

2.9 Description of Interaction

[REDACTED] Further detail of key steps and interaction to date, and planned, is detailed in Section 13.

2.10 Meeting National Framework Requirements

SW is following the requirements of the National Framework for Water Resources in developing this option. This includes working with neighbouring water companies across southern England to efficiently manage water resources at a regional level. Further detail related to the process and factors considering the feasibility of options at this stage is provided in Section 11.2. Option D.2 would need to interact with other water source options considered through the non-accelerated gate process for delivery under WRMP24, plus existing sources and distribution infrastructure.

3 Outline Project Plan

3.1 Delivery Schedule

SW has developed a schedule for each option testing the ability to deliver this option by 2027 in order to meet the 'all best endeavours' obligation in the Section 20 agreement. At this stage, noting the complexity of the projects and the level of uncertainty (as with any major infrastructure project at this stage in its lifecycle), feasibility studies and programming work currently indicate a later timeline for delivery of this solution than 2027.

At present, the earliest deployable date for Option D.2 is Q4 2028, however this schedule is still developing and further work will be required during Gate 2 activities to bring it to a similar level of maturity as the desalination and water recycling options considered. This schedule does not include contingency and represent an 'all best endeavours' approach, however, it is reliant on the realisation of opportunities and the mitigation of risks. SW will continue to optimise the programme for delivery between Gate 1 and Gate 2 and will use all best endeavours to realise opportunities for earlier delivery.

Further detail regarding the current estimated schedules is provided Annex 16 Delivery Schedule and the schedule is illustrated in Figure 1.

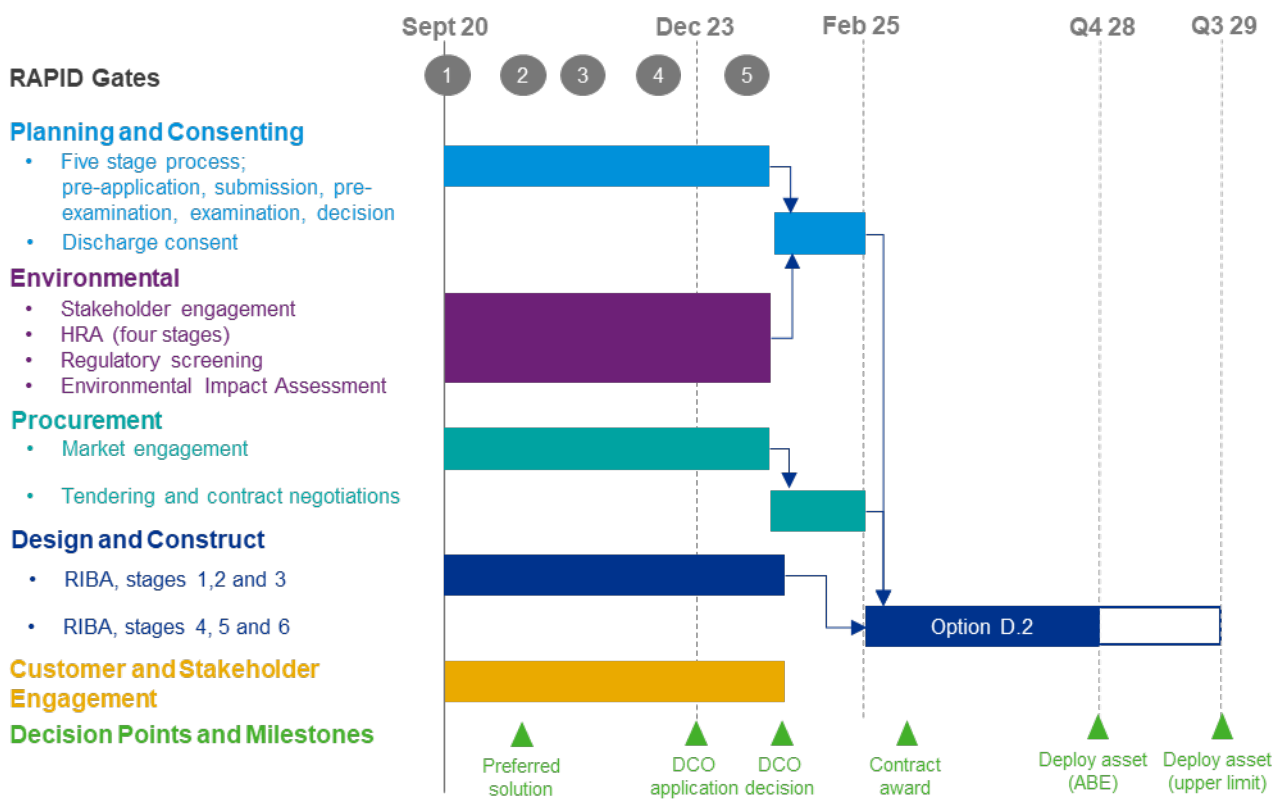


Figure 1 - Project Plan – Option D.2

The phasing of key activities and milestones aligned to key decision points and each stage of the RAPID Strategic Solution gate processes is detailed in Table 6.

Table 6 – Key activity and milestones in line with RAPID gates for desalination-based options

Gate or milestone	Key Activities	Planned Completion Date
Gate 1	<ul style="list-style-type: none"> • Preliminary solution feasibility and viability analysis • Initial consideration of consent application route • Initial outline of the solution procurement strategy and approach • Initial engagement with customer and stakeholders to understand the early views of potential solution options • [REDACTED] • Solution development for the programme development, including development of detailed schedule for the Gate 2 activities of RAPID's gated process. 	September 2020
Gate 2	<ul style="list-style-type: none"> • Conceptual Design development • Conduct on-site surveys and sampling for site and location specific considerations • Outline strategic SEA/HRA/WFD • [REDACTED] • Detailed procurement strategy including suitability assessment for DPC • Update schedule for overall programme, including development of detailed schedule for Gate 3 activities of RAPID gate process 	September 2021

Gate or milestone	Key Activities	Planned Completion Date
Gate 3	<ul style="list-style-type: none"> Updated final feasibility and viability analysis DCO applications for pre-consent application activities Land Referencing HRA Stage 1 and environmental impact screening Update schedule for overall programme, including development of detailed schedule for Gate 4 activities of RAPID gate process Developed design phase continuation 	May 2022
Gate 4	<ul style="list-style-type: none"> Tender process preparation, including document preparation OJEU contract notice and tender phase Developed design phase continuation Continuation of consent application Update schedule for overall programme, including development of detailed schedule for Gate 5 activities of RAPID gate process 	April 2022
Gate 5 (if required)	<ul style="list-style-type: none"> Finalise contract negotiations Appoint contractor Discharge consent and environmental conditions Pre-construction technical design Update and confirm construction phase delivery schedule 	September 2023
Post Gate 5	<ul style="list-style-type: none"> Construction Commissioning and network integration (subject to HTWSR commissioning) 	Q1 2025 to Q4 2028
	<ul style="list-style-type: none"> Earliest feasible deployable output date – solution commences operations 	Q4 2028 to Q1 2029

SW proposes that option D.2 should be progressed beyond Gate 1, to determine its feasibility in greater detail. It is possible that some of the strategic alternatives may be determined not to be feasible or deliverable, in which case they will be discontinued prior to Gate 2, and information regarding their discontinuation will be provided at Gate 2. The Base Case and the strategic alternatives which are not discontinued will be progressed to Gate 2. SW will engage with RAPID throughout the period between Gates 1 and 2, including in respect of any proposed discontinuation of alternatives.

At Gate 2 SW proposes that a decision should be made by RAPID in its Gate 2 determination as to which solution should be progressed through the remaining gates in the Gated Process (i.e. a preferred solution - the Base Case or a strategic alternative - should be selected by RAPID, and all other solutions will 'fall away', save to the extent that they are relevant to WRMP24 and future programme delivery).

In this context it should be recognised that the Base Case and strategic alternatives may evolve from the projects described at Gate 1, such as in relation to their specific locations, capacities, their relationship with some of the other projects or other factors, as further design, assessment and forward planning is undertaken, to reflect the optimal configuration for the relevant project both in isolation and as part of the wider programme. In the event that such an evolution takes place between Gate 1 and Gate 2, SW will engage with RAPID in respect of the evolution, and information regarding the 'evolved' version of the relevant project will be submitted at Gate 2.

Examples of the key activities planned to be completed prior to Gate 2 are summarised in section 15, with further detail provided in Annex 20 Gate 2 Activity Plan.

3.2 Schedule Assumptions

Key assumptions made in developing the delivery schedules include, but are not limited to, the following:

- the procurement strategy will not be through a DPC route (to be confirmed following further assessment);
- the planning route for planning and environmental consent will be DCO;
- all third-party approvals are in place, including complex crossings (for example of the A3 - Highways England - and main railway line - Network Rail - at Otterbourne WSW);
- all necessary upgrade works at Otterbourne WSW will have been completed under the AMP7-8 capital project, and ahead of Option D.2 commissioning;

- pipeline construction will take c. 25-months, achieving a pipeline lay rate of 350m/week;
- commissioning will take c. 12-months;

• [REDACTED]

• [REDACTED]

• [REDACTED]

• [REDACTED]

3.3 Critical Path

Key activities on the critical path identified at this stage are the site selection, environmental survey and on-site testing. Following Gate 3, the critical path moves through the procurement activities to Gate 5, from which point the critical path moves to the discharge of consents, construction and commissioning.

3.4 Programme Progress

SW is delivering on schedule against the ‘Accelerated Gated Process’, however, at this stage, and noting the complexity of the projects and the level of uncertainty (as with any major infrastructure project at this stage in its lifecycle), feasibility studies and programming work currently indicate a later timeline for delivery of Option D.2 than 2027. As detailed in Section 3.1, the earliest deployable date currently shown in the programme is Q4 2028, delivering against an ABE optimised schedule, and an upper limit of Q1 2029.

3.5 Information Status and Plan

The information provided by SW as part of this Gate 1 submission, shown against the RAPID requirements in the Accelerated Gate one assessment summary of process and criteria³, is detailed in Table 7.

Table 7 – Option D.2 current status of information

Category	RAPID Requested information - RAPID Accelerated Gate One Assessment Summary of Process and Criteria	Has this been answered and location in PFA 4?
Solution Design	Is the solution, and all sub options under consideration well described to allow the assessment to proceed?	• Yes, Sections 2.2 & 4
	What evidence is there of solution development and is this sufficient for the development to progress?	• Technical information included sections 2.2 & 4
	Are the benefits the project will bring in terms of water resources clearly articulated and defined?	• Yes, Sections 4.3.5
Evaluation of cost and benefits	To what extent do the costs for the project delivery and operation represent evidenced, efficient costs?	• Cost estimate and Gate 1 spend tracking included section 4.3.4 & 14.1
	Are all the non-water resource benefits, societal and environmental, costed and/or evaluated as appropriate?	• Yes, evaluated as appropriate for this stage, see sections 5.1 & 10
Risk and programme management	Does the submission clearly demonstrate that the delivery of the solution is on track?	• Yes, sections 3.1 & 3.2
	Does the programme plan set out key milestones; clear identification of any changes, delays and mitigation measures?	• Yes, Section 3.1 – schedule risks to be analysed quantitatively post Gate 1
	To what extent are water quality and environmental risks assessed and evaluated?	• Qualitatively, section 5.2

³ <https://www.ofwat.gov.uk/wp-content/uploads/2020/06/Accelerated-Gate-One-assessment-summary-of-process-and-criteria-v1.pdf>



Category	RAPID Requested information - RAPID Accelerated Gate One Assessment Summary of Process and Criteria	Has this been answered and location in PFA 4?
	Are assessments carried using monitoring and methods agreed with regulators?	<ul style="list-style-type: none"> Industry good practice and methods applied and aligned to SW policy
	What evidence is there that regulatory barriers have been considered?	<ul style="list-style-type: none"> See sections 7 & 10 for evidence
	Initial option-level environmental assessments, meeting local requirements as well as complying with SEA and HRA legislation, including consideration of in-combination effects and identification of environmental risks that need mitigating through the solution design and costing.	<ul style="list-style-type: none"> See Section 5.1 for evidence
	Are areas of uncertainty identified and how well developed are there proposals to manage the uncertainty?	<ul style="list-style-type: none"> Yes, throughout technical areas. Further investigations to be completed post Gate 1, included in Section 15
	How well have the parties evidenced that expenditure to date has been efficient?	<ul style="list-style-type: none"> Evidence provided in Section 14
Consistency and context	How well has the solution been placed in context of company/regional/national plans?	<ul style="list-style-type: none"> See section 11
	To what extent are data and methods of analysis consistent with those recommended / agreed / used in regional plans and other solutions?	<ul style="list-style-type: none"> See section 11
	How well are dependencies identified and issues managed?	<ul style="list-style-type: none"> Well understood, Section 3. Further detail to be developed post Gate 1
	What evidence is there of engagement with stakeholders and to what extent is the engagement robust and representative?	<ul style="list-style-type: none"> Extensive, see Section 8
	Is a clear recommendation made for the scheme to proceed/stop and what evidence is this recommendation based on?	<ul style="list-style-type: none"> Further feasibility investigation required to recommend option progression / de-selection
Assurance and board engagement	What strength of evidence is there in terms of internal assurance and 3rd party assurance?	<ul style="list-style-type: none"> Strong, detailed in Section 12
	To what extent is evidence of continued Board engagement provided?	<ul style="list-style-type: none"> Completed, detailed in Section 12
	Is it clear that the Board endorse the scheme and its continuation?	<ul style="list-style-type: none"> Yes, detailed in Section 12

4 Technical Information

4.1 Option Configuration

4.1.1 Technical overview

The WRMP19 identified baseline supply and demand deficits of -186 MI/d and -192 MI/d for MDO and PDO respectively across the Hampshire region for a 1-in-200-year drought scenario, depending on which of two drought types is considered. To reduce this deficit a series of steps were proposed including the 21 MI/day bulk supply of treated water from PW by construction of an impounding reservoir and works at the reservoir. The reservoir will be owned, operated and managed by PW.

If all the other schemes set out in the Preferred Strategy in WRMP19 deliver as expected, there will still be a need for a significant new source delivering at least 61 MI/d in order to meet the forecast deficit. During the WRMP19 process, the primary Solutions initially considered to bridge this deficit comprised desalination and water recycling, with desalination being included in the Preferred Strategy and as is also the Base Case for this submission.

Further potential options comprising water transfers have since been identified following publication of the WRMP19 process, and a possible option [REDACTED] is presented here as an alternative solution (Option D.2), which, if used, would be additional to the existing bulk transfer relying on Havant Thicket reservoir in WRMP19.

Developmental work undertaken to date on Option D.2 includes the consideration of network infrastructure, [REDACTED]

Other bulk supplies remain unchanged from the WRMP19 Preferred Strategy, and this Option D.2 would operate concurrently with the 21 Ml/d potable water transfer from PW, [REDACTED]. A process flow diagram is illustrated in Figure 2.

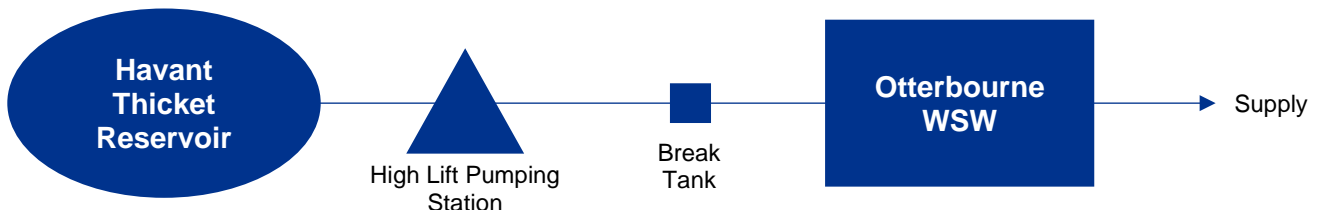


Figure 2 - Initial schematic view of Option D.2

4.1.1.1 Option D.2 – [REDACTED]

[REDACTED]

Otterbourne WSW would treat incoming raw water to drinking water standard before being distributed into Southern Water’s supply network. New process measures at the existing Otterbourne WSW with sufficient capacity to receive elevated flows arising from Option D.2 are being delivered as part of planned AMP7-8 Capital Programme works. Network improvements, including a centralised Supply and Demand Management Control System would be implemented under this option as common to all Options.

Option D.2 is scalable in terms of the raw water transfer rate: [REDACTED]

[REDACTED]

4.2 Site Plan

Figure 3 illustrates the location plans of the three potential pipeline routes options

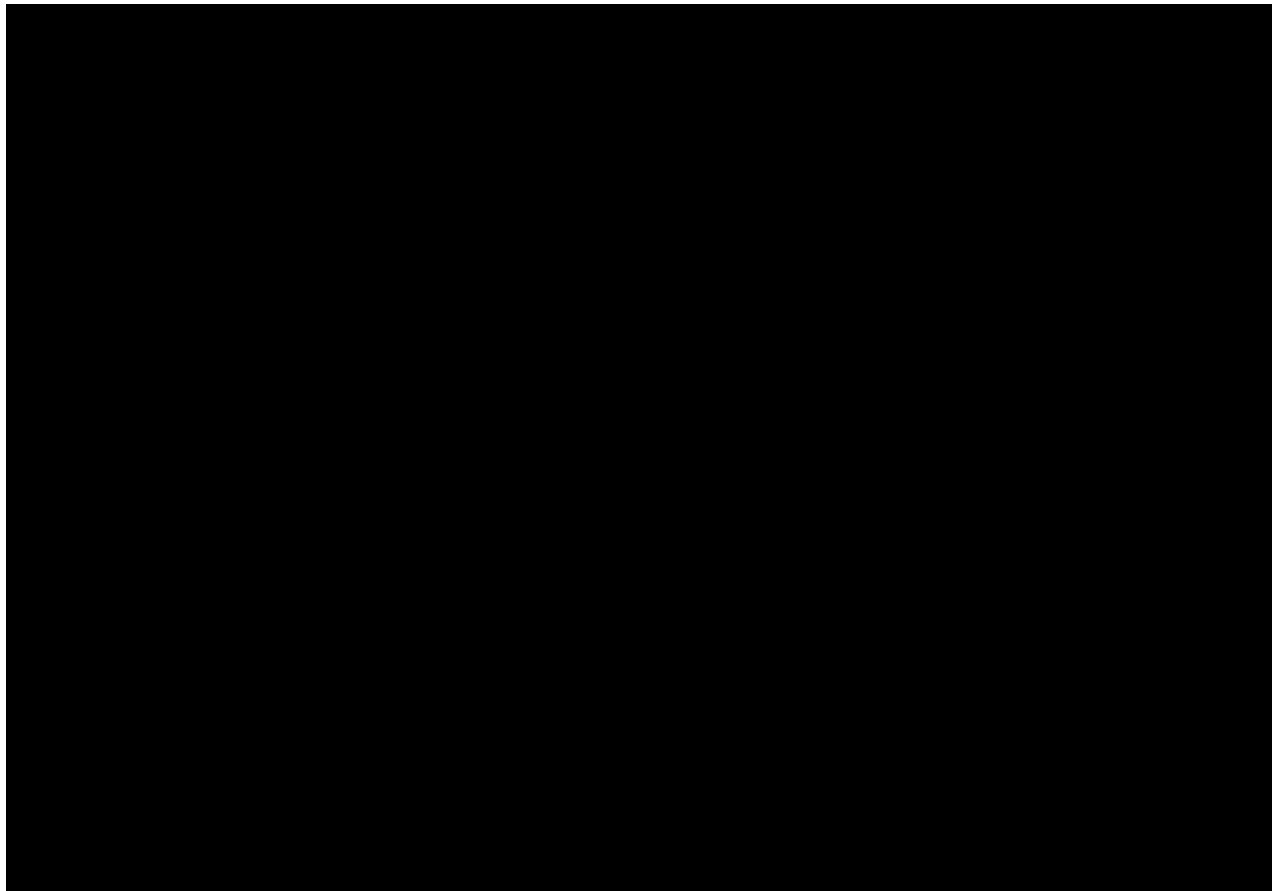


Figure 3 - Outline Pipeline Route Plan for Option D.2

4.3 Operations and Maintenance Considerations

4.3.1 Operating Need

Drought modelling completed by SW identified that Option D.2 would not be required to supply water until a 1-in-10-year drought event and would be in operation for 4 days (in a 365-day period) providing a total of 18MI, at an approximate maximum flow rate of 6MI/d. Existing water transfers and water sourcing methods are sufficient to bridge the Supply-Demand Balance deficit to this point. This analysis also identified that during a 1-in-200-year scenario, Option D.2 would be required for to operate for approximately 138 days in a 365 day-period, providing a total of approximately 6,476 MI. It should however be noted that the modelled flow rate currently overpredicts by approximately 8 MI/d. Therefore, when corrected, Option D.2 would be required to deliver c. 1,104 MI less per annum (i.e. 5,372 MI). This will be corrected during future modelling stages, together with a review of all assumptions made to ensure that they are not overly conservative.

Further details of this analysis are provided in Annex 8.4 Network Technical Reports: Additional Option and Annex 7 Strategic Modelling.

4.3.2 Operating Approach

It is assumed that the network will be controlled utilising a holistic real-time system, as this will bring better control and stability. This would install a consistent monitoring system across the new and existing infrastructure, which would be integrated together and controlled through the Regional Control Centre (RCC) This holistic approach also supports SW's pro-active network management ethos. Examples of the benefits

of automated control include predictive analytics of demand, lower pumping costs, more effective management of production and turnover within storage assets. Further detail of the controls of the operating approach are provided in Annex 8.4 Network Technical Report: Additional Option.

4.3.3 Asset and Design Life

Asset and design life assumptions included in the cost estimate are detailed in Table 8. These assumptions are further provided throughout Annex 12 Cost Report.

4.3.4 Cost and Benchmarking

Initial CAPEX, OPEX and WLC estimates and CAPEX benchmarking undertaken to date is detailed in Table 8. Further detail is included in Annex 12 Cost Report.

Table 8 - Initial cost estimate: Option D.2

Component	Section	CAPEX				Opex (£m) (60 years)	WLC (£m)
		Estimated CAPEX Cost (£m)	Estimate Benchmark Value (£m)	Equivalent Benchmark Value (£m)	Variance (%)		
Abstraction	Draw off Works	■	■	■	■	■	■
	Raw water Bulk Supply	■	■	■	■		
Pipelines	Route 1	■	■	■	■		
	Route 2	■	■	■	■		
	Route 3	■	■	■	■		
Operating Expenditure considerations / Asset Life Expectancy, (OPEX* not separated out for pipeline) <ul style="list-style-type: none"> • Mechanical and Electrical, 20 years (unless specified) • Instrumentation, 10 years • All concrete structures and all components, 60 years • Concrete service reservoirs, tunnels and shafts, 100 years All pipelines including pressurised pipelines, 60 years <ul style="list-style-type: none"> • Intakes and outfalls, 100 years • Chambers and manhole, 60 years • Masonry and steel framed buildings and all components, 60 years • Pumps – major overhaul, 10 years and full replacement, 20 years • Membranes, 5 years Other items considered within the OPEX calculations include chemical usage, electric consumption, maintenance labour requirements and additional operational and maintenance requirements, but these are variable costs, so assumptions have been made around these.							

4.3.5 Water Resource Benefit

4.3.5.1 Regional Water Resource Benefits

The primary benefit of Option D.2 is the additional security and resilience of supply during droughts. SW is actively participating in regional water resource modelling and planning, which is managed by Water Resources South East (WRSE), in line with the national framework⁴ requirements. This will ensure that whilst Option D.2 can address the water resource deficit, it can also potentially be used to optimise hydrology across the region.

4.3.5.2 Water Resource Modelling

A water resource modelling study has been undertaken to assess the impact of licence reductions to Southern Water’s infrastructure under various scenarios. The modelling study was carried out using Aquator software. This model predicts the usage of sources to meet demands via a high-level representation of the water supply network, and will be further refined during Gate 2 activities.

⁴ Meeting out future water needs: a national framework for water resources, 16 March 2020



Among the primary aims of water resource modelling was testing the potential conjunctive use of the proposed reservoir. Using the Aquator model, the operational drawdown and yield of the reservoir has been simulated in response to drought events affecting Southern Water's sources in Hampshire.



Figure 4 - Havant Thicket available storage

5 Environmental and Drinking Water Considerations

5.1 Strategic Environmental Assessment (SEA) and Habitat Regulations Assessment (HRA) appraisals

As detailed through Section 4, site selection work for infrastructure associated with Option D.2 is a key dependency for completing environmental appraisals. Appraisals to date have been conducted as desktop exercises with more detailed analysis planned post Gate 1, as detailed in Annex 20 Gate 2 Activity Plan.

5.1.1 SEA and HRA appraisals – Stage 1

The initial environmental appraisal undertaken included an assessment of the solutions following the principles of Habitat Regulations Assessment (HRA), Strategic Environmental Assessment

(SEA), Water Framework Directive (WFD) and Natural Capital Assessment (NCA), as described in Table 9. It should be noted that these are not formal statutory documents, but to maintain consistency they have been completed in a similar way to the assessments undertaken as part of the WRMP19.

Table 9 - Initial option level environmental appraisal considerations: Option D.2

Environment Appraisal	Appraisal consideration
Strategic Environmental Assessment (SEA) Further detail of the appraisal considerations are included in Annex 10.4 Environmental Appraisal: Additional Option	<ul style="list-style-type: none"> Biodiversity, flora and fauna Population and human health Material assets and resource use Water; Soil, geology; and land use Air and climate Archaeology and cultural heritage Landscape and visual amenity
Habitat Regulations Assessment (HRA) Further detail of the HRA appraisal considerations are included in Annex 10.4 Environmental Appraisal: Additional Option	<ul style="list-style-type: none"> Biodiversity, flora and fauna (HRA specific open source data) Likely significant effects on European designated conservation sites under the Habitats Regulations (Stage 1 Screening)
Water Framework Directive (WFD) Further detail of the WFD appraisal considerations are included in Annex 10.4 Environmental Appraisal: Additional Option	<ul style="list-style-type: none"> Biodiversity (fauna and) flora (WFD specific open source data) Water (WFD chemical and quantitative status; Bathing Water Directive; Drinking Water Directive: Drinking water protected area; Shellfish Directive: Shellfish water; Nitrates Directive: Nitrate Vulnerable Zones; Urban Waste Water Treatment Directive: Nutrient sensitive area or eutrophication sensitive area)
Natural Capital Assessment (NCA) Further details of the NCA appraisal considerations are included in Annex 10.4 Environmental Appraisal: Additional Option	<ul style="list-style-type: none"> Environmental benefits Environmental disbenefits Opportunities for achieving net gain and improving environmental resilience

5.1.2 Appraisal results – Stage 1

The high-level environmental screening was assessed against a structured rating scale detailed in Table 10. The results of the stage 1 screening completed are detailed in Table 11.

Table 10 - Stage 1 screening RAG status legend

Risk of adverse effects grade (SEA, WFD, NC)	Risk of adverse effects grade (HRA)	Opportunity for beneficial effects grade (NC)
Negligible	No risk to European designated sites	No beneficial effects / not applicable
Minor adverse impacts likely, 'standard' best practice mitigation activities	Potential adverse impacts on European designated sites considered possible	Potential for beneficial effects
Moderate adverse impacts likely, mitigation required to overcome	Potential adverse impacts on European designated sites considered likely	Potential for moderate beneficial effects
Major adverse impacts likely, very challenging to overcome		Potential for major beneficial effects
Substantial adverse impacts, cannot be overcome with mitigation		

Table 11 - Summary of environmental screening results for key components of Option D.2

Component	D.2		
	Route 1	Route 2	Route 3
Water resources and water quality	Green	Yellow	Yellow
Biodiversity, flora and fauna	Red	Red	Red
Archaeology and cultural heritage assets	Red	Red	Red
Landscape and visual amenity	Red	Yellow	Red
Other environmental considerations	Yellow	Yellow	Yellow

Component	D.2. [REDACTED]		
	Route 1	Route 2	Route 3
WFD	n/a		n/a
HRA Stage 1 Screening			
Natural capital			

The pipeline routes presented in the above table are illustrated in Figure 3. A high-level cumulative effects assessment has been undertaken with other relevant plans, programmes and projects, including other water companies WRMPs, Drought Plan and other development plans in the area. The initial results are detailed in Table 12. Further assessment will be undertaken as part of the Gate 2 activities, as detailed in Annex 20 Gate 2 Delivery Plan.

Table 12 – Cumulative environmental effects: Option D.2

Stakeholder Group	Project / Programme / Region	Effects
SW	Central and Eastern Zones	Pending option and final transfer pipeline route selection, there is possible need for pipeline construction through the South Downs National Park. There are other central zone pipeline transfer projects in the early stages of development that are expected to require physical works through the South Downs National Park.
	Drought Plans	Unable to confidently model at this stage, as any cumulative effects are dependent on the pipeline route and construction method selected.
Neighbouring Water Companies	Affinity Water	Not expected, but greater clarity expected once the site selection process has progressed
	South West Water	
	Bournemouth Water	
	Thames Water	
	Wessex Water	
	Cholderton and District Water Company	
	Sutton and East Surrey	
	South East Water	
Portsmouth Water	[REDACTED]	
Other industries and developments	N/A	There are no impacts on other industries and developments that SW is currently aware of.

5.1.3 Other Appraisal Results

5.1.3.1 Contribution to environmental net gain

At this stage high level potential opportunities for environmental net gain have been identified for Option D.2. These include, but are not limited to, the following:

- Contribution to net biodiversity gain;
- Wider environmental benefits of restored habitat, such as carbon sequestration, air and water purification, can be captured in natural capital appraisal;
- In combination with additional commitments to utilise renewable energy sources, the carbon sequestration effect of habitat re-creation could help the solution to be consistent with the UK Government's net-zero carbon target⁵; and
- Habitat restoration within the New Forest National Park could create wider social benefits, such as improved visual amenity.

⁵ UK Government target to achieve net-zero carbon by 2050 as per the Climate Change Act 2008 (2050 Target Amendment) Order 2019.

Any offsetting or mitigation schemes will be included in the design so that future stages of natural capital assessment can take account of any potential social and environmental benefits. More detail will be provided for Gate 2.

5.1.3.2 Carbon considerations

An initial carbon impact appraisal has been prepared, which that models the anticipated carbon emissions from each Option. The results of the appraisal, that include consideration of total carbon, embodied carbon and carbon emissions associated with each option considered are detailed in Table 13.

Table 13 - Carbon appraisal results – Option D.2

Option	Carbon – from capital delivery (tCO ₂ e)	Carbon – from operational life (tCO ₂ e)	Carbon – Whole of Life (WoL) (tCO ₂ e)	Carbon per water treatment (over 60 year lifespan) (tCO ₂ e / MI)
D.2	27,300	8,520	35,900	588

Further detail of the approach applied to conduct the appraisal and the results is provided in Appendix J: Western Grid Carbon Estimates of Annex 10.4 Environmental Appraisal: Water Recycling.

By comparison with desalination and water recycling solutions which are both energy intensive and carbon 'heavy' solution configurations, Option D.2 is expected to have a significant reduced whole life carbon use, as shown in Table 13.

5.1.3.3 Resilience considerations

Option D.2 is a purpose constructed 'resilience asset', meaning that it is only required during times of water supply stress, with water supply from other sources expected to be sufficient during non-drought periods. Specific environmental resilience benefits are not currently identified for Option D.2, but these will be considered in detail as the option is developed prior to Gate 2.

5.1.3.4 Social, environmental and customer benefit

No inherent social, environmental and customer benefit has been identified at this high level for Option D.2, however, environmental impact offset components will be designed into the option post Gate 1.

5.1.3.5 Value to Customers

As detailed in Section 5.1.3.3, the primary use and benefit of Option D.2 is the provision of a secure water source for the Hampshire region during severe drought. Option D.2 has the potential to provide additional benefit, such as community and alternative use amenity value, however this needs to be considered further and in greater detail during future design stages.

5.2 Water quality considerations

5.2.1 Source Water Considerations

Water Quality testing has been carried out at [REDACTED] to understand influent (seawater) quality characteristics, to inform process design requirements. Parameters tested include salinity, turbidity, pathogenic bacteria, pathogenic protozoa, viral pathogens, cyanotoxins, algae, boron, sodium, sulphate, chloride, chlorate, bromide, pH level, trihalomethanes, Total Dissolved Solids (TDS), Total Organic Carbon (TOC) and petroleum. Parameters with relatively 'high' results; TDS, turbidity, TOC and boron, indicate the requirement for a specific pre-treatment stage for the desalination process. Further detail of source water quality is detailed through Section 2.1 Annex 5 Desalination: Technical Report.

5.2.2 Condition Requirements

[REDACTED] and as such, would be required to comply with the Drinking Water Inspectorate (DWI) requirements, including water [REDACTED]

safety planning approach.

Table 14 - Design Raw Water Quality water quality sampling

Blending of the raw water will not be essential prior to entering the Otterbourne WSW, mainly because its quality is broadly similar to the existing groundwater resources for Otterbourne WSW. However, the existing Otterbourne WSW facilities would require modifications to optimise the WSW treatment process, before being passed into network supply. These are being integrated with planned AMP7-8 Capital Programme works at this site.

The existing discharge to the River Itchen, from Otterbourne WSW, will require a new permit to reflect the change in the source of water. Further investigation into the changes of mineral concentration in the discharge will be required during Gate 2 works.

5.2.3 Drinking Water Safety Plan Development

SW is following a five-step process aligned to British Standard (BS EN 15975-2:2013 (BS15975-2)) to develop the Drinking Water Safety Plan (DWSP). Further detail of the DWSP process is provided in Section 3.2 Annex 5 Water Recycling: Technical Report.

Specific drinking water safety hazards are to be identified and assessed following this process and will be used to inform a Water Quantitative Risk Assessment prior to Gate 2. To inform this



process, sampling, similar to that detailed in Section 5.2.2, will take place following a structured sampling plan which with hazards included in the DWSP database. This sampling plan will form the basis for the risk identification, assessment and verification stage, managed by SW's Water Quality team, of the DWSP development process.

5.2.4 Regulatory Barriers

SW has engaged with multiple regulators, including DWI, throughout the Gate 1 process, and will continue to do this throughout the project lifecycle 1. A key purpose of this engagement is to ensure that the DWSP meets DWI requirements and provides appropriate detail on how SW will manage and ensure water safety, once operational. This includes ensuring that water is acceptable to customers and meets drinking water safety standards. Further detail of the engagement with regulators completed during the Gate 1 stage is provided in Section 8.2.

6 Procurement and Operational Strategy

6.1 Procurement

6.1.1 Initial Procurement Strategy

Owing to its relative level of maturity, SW has not yet investigated the most appropriate procurement strategy for the delivery of Option D.2, and will do so during Gate 2 works. The approach adopted will be consistent with that applied across the WFLH programme and will include an assessment of:

- Direct Procurement for Customers (DPC) eligibility for the purpose of Gate 1
- DPC tender model assessment;
- Pre-DPC activity delivery including packaging, procurement and client role options; and
- Fall back strategy for delivery of the scheme through alternative routes other than DPC.

Further details of this approach can be found in Annex 11 Commercial Strategy. Based on Ofwat's guidance within the Draft Determination, Initial assessment of Plans (IAP) and Final Determination (FD), SW has developed and will apply an eligibility framework to determine the most appropriate procurement route, during activities to Gate 2. Some aspects of the framework criteria have been interpreted to enable a practical application as part of the assessment. The framework comprises a three-step test, as detailed in Table 15.

Table 15 - DPC eligibility framework

Step	Test Parameter	Test Parameter characteristics	Further detail
1	Size Test based on the £100m threshold for whole life costs	Scheme costs will be considered on a nominal and real basis, including development costs, initial CAPEX, renewal CAPEX and OPEX.	Annex 11 Commercial Strategy
2	Discreteness Test	Consider specific operational and technical considerations of the asset within the wider context of SW's network based on Ofwat technical report: <ul style="list-style-type: none"> • Interactions with the network. • Asset and operational failures. • Contributions to supply capacity and ability to specific outputs. • Stakeholder interactions and statutory obligations. 	Annex 11 Commercial Strategy
3	Quantitative VfM Test	<ul style="list-style-type: none"> • The options are compared on a Net Present Value (NPV) basis of required revenues between a factual and counterfactual. • Factual: a project finance type framework for delivery of the scheme via DPC. • Counterfactual: delivery of the scheme by SW under a regulatory price control framework. 	Annex 11 Commercial Strategy

6.1.2 [REDACTED]

[REDACTED] A Bulk Supply Agreement (BSA) between PW and SW for the 21MI/d bulk supply in the WRMP19 Preferred Strategy is in an advanced stage of negotiation and will define the commercial and contractual relationship between both parties.

From the perspective of the operational utilisation of the reservoir, a collaborative water sharing protocol between SW and PW has been agreed. The BSA describes the working arrangement for arranging bulk water transfer from the reservoir, using the principles of a long-range 'forecast' and 'request' basis (i.e. SW forecasts a need with as much notice as possible, for example in anticipation of a drought, and then lodge a formal request once the need is crystallised).

6.1.3 HTR Contracting Strategy

PW has obtained Ofwat approval to pursue a non DPC route for the construction of the reservoir itself. Atkins have been appointed to develop an outline design for the reservoir to a level of detail suitable for planning submission and contractor procurement. Atkins' work builds upon an outline design previously undertaken by Arup for Portsmouth Water. Agilia Infrastructure Partners have been appointed as programme managers to oversee the HTWSR project.

PW currently plans to submit the reservoir for planning approval during Q3/4 of 2020, following a traditional Town and Country Planning approach. During Q1/2 of 2020, they also undertook some market testing and bi-lateral contract engagement, to establish appetite for involvement in reservoir and enabling works construction. PW will let two main contracts for the infrastructure associated with HTR:

1. Package 1 – HTWSR reservoir main works (including Farlington WSW upgrade)
2. Package 2 – HTWSR to Bedhampton fill-discharge pipeline

Following BSA finalisation, PW will run a PQQ competition to establish a short-list of contractors to invite to tender for the construction of the reservoir.

6.2 Asset Utilisation

The HTR will be owned by Portsmouth Water, with SW sourcing water from bulk transfers enabled by water stored in the reservoir. [REDACTED]

Table 16 details the forecast production requirements of the desalination plant, in terms of days and total water volume expected to be transferred in various drought scenarios. Further detail is provided in Annex 8.4 Network Technical: Additional Solution.

Table 16 - Operational Utilisation

Drought Return Period (years)	Annual Days Operation	Annual Volume Transferred (MI)
1	0	0
2	0	0
5	0	0
10	4	18
20	26	341
50	76	2,322*
100	99	3,557*
200	138	6,476*

*Note: Aquator modelling is currently over-predicting transfer rates by c. 8MI/d, which is equivalent to up to 1104MI of volume transferred during a 1 in 200-year drought event



W will further refine the modelling during activities to Gate 2, including reviewing all assumptions made to date to ensure that they are not inherently over-conservative.

7 Planning Considerations

7.1 Preferred Planning Route

A Development Consent Order (DCO), under the Planning Act 2008, or planning consent under the Town and Country Planning Act 1990 (TCPA) are the consent and planning regime options available. SW undertook a screening process of the DCO and TCPA approaches to determine the suitability of each approach. DCO is the preferred consenting route for all solutions under consideration, including Option D.2. The key benefits that the DCO planning route provides includes, but is not limited to:

- Greater certainty and clarity over the decision-making process and the timings associated with the planning process
- Greater alignment and support with national policy
- Greater opportunity for community and stakeholder participation
- Greater powers and other provisions that go beyond those of alternative planning approaches.
- Compulsory land purchase and temporary land occupation applications to be completed in the same process – saving time and resources with multiple applications.

The key risks and opportunities of the DCO and TCPA consenting options are summarised in Table 17. Further detailed explanation of the risks and opportunities are detailed in Section 2.1 Annex 13 Planning Strategy.

Table 17 - DCO consenting approach key risks and opportunities

	Key risks and disadvantages	Opportunities and benefits
DCO approach – under Planning Act 2008	<ul style="list-style-type: none"> Secretary of State may refuse a request for a direction to make the project qualify as a NSIP (where a solution does not automatically meet the threshold set out in PA 2008 e.g. 80 Ml/d) Likely to take longer to secure than Planning Permission (if no public inquiry and TCPA advisory timescales are met) Requires significant investment upfront ‘front loaded’ (e.g. surveys, consultation with stakeholders and the community) Cost is likely to be more for DCO compared to TCPA (cost of front-loading documents, consultation and examination, expert team) 	<ul style="list-style-type: none"> Requirement for extensive pre-application with PINS, stakeholders and the community reduces risk of unforeseen issues/objections Provides certainty and ‘positivity’ in process (i.e. NPS establishes the needs case) High success rate, particularly for projects with NPS support. Front loaded nature and PINS acceptance gate before examination helps to reduce successful judicial review challenges Greater potential to avoid historic issues of lengthy / costly delays during considerations of the consent application. Inquisitorial examinations are typically more favourable than adversarial inquiries
Planning Application under TCPA 1990	<ul style="list-style-type: none"> Multiple planning permissions required due to the scale of the project, may present difficulties in terms of coordination of approach/lead authority. Public inquiry potentially lengthens consenting process and does not have defined duration. Increases the number of separate consent applications required. 	<ul style="list-style-type: none"> More common consenting route, familiarity by local authorities. Likely to be quicker to obtain planning permission over a DCO (assuming no lengthy public enquiry) A lower level of detail required at the submission. Greater emphasis on post consent discharge of conditions / investigations.

7.2 DCO Planning Steps

The use of the DCO planning process is limited to projects that are defined as National Significant Infrastructure Projects (NSIP), under section 14 of the Planning Act 2008. Types of projects considered to be NSIPs include:

- Development relating the transfers of water resources;
- The construction or alteration of a desalination plant; and
- The construction or alteration of a reservoir or dam.

Under these criteria, Option D.2 would not automatically pass this threshold and would require a section 35 Direction from the Secretary of State in order to be classified as an NSIP, and therefore eligible to utilise the DCO consent route. The key steps in the DCO planning approach process, including requesting a Section 35 Direction, are illustrated in Figure 5. Also shown are statutory timeframes that will drive the overall project schedule through this part of the programme.

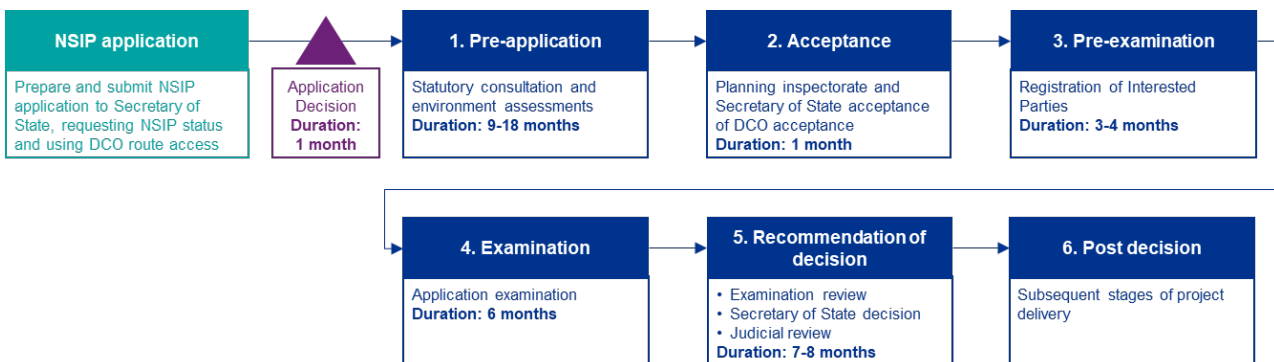


Figure 5 - DCO process

8 Stakeholder Engagement

8.1 Customer and Stakeholder Complexity Views

Engaging proactively and openly with regulators, stakeholders and customers is essential to the success the WfLH programme. Customer and stakeholder perceptions have the power to shape programme delivery, irrespective of configuration selection.

Customer and stakeholder perceptions have the power to shape programme delivery, irrespective of configuration selected. Detail of the approach and process utilised by SW to engage with, and understand the views of, customers and stakeholders is provided in Annex 15 Stakeholder and Customer Report.

SW has engaged with a broad range of customers and stakeholders regarding the WfLH programme. The customers and stakeholders engaged with to date, and to be engaged with as the programme continues, are detailed in Table 18.

Table 18 - Customer and stakeholder groups

	Customer and Stakeholder groups engaged	Customer or Stakeholder
		Definitions included in Section 1 Annex 15 Stakeholder and Customer Report.
1	Customers	Customers defined as “those that play a role within our region which includes a diverse range of life stages, beliefs and experiences such as; bill payers (household, non-household), diverse cultures, future, those in vulnerable circumstances, stakeholders and different customer segments.”
2	Customer Action Group	
3	Businesses	
4	Hampshire Chamber of Commerce	
5	Community groups	
6	SW staff	Stakeholders Defined as “A representative of an organisation or group with an interest in the planning, delivery or impact of Water for Life – Hampshire. These include regulators, planning authorities and environmental groups”.
7	Regulatory bodies (Ofwat, Natural England, Environment Agency, DWI, MMO)	
8	Consumer Council for Water	
9	Government organisations (e.g. councils)	
10	Environment groups and regulators	
11	Wildlife trust	
12	Members of Parliament	
13	National Farmers Union	
14	Media	

Key trends in the views of customers and stakeholders observed during the engagement conducted to date are detailed in Table 19. In some cases there are directly conflicting views between varying customers and stakeholders and these will need to be managed as engagement activities continue.

[REDACTED] Liaison between both companies is frequent and on-going from operational and project delivery through leadership and executive levels.

Table 19 - Trends in customer, stakeholder and objector views

	Customers	Stakeholders
Challenge	<ul style="list-style-type: none"> • Little or no knowledge of the water supply deficit • Low understanding of droughts and water abstraction • Impacts on personal water bill is paramount • Hold concerns for future generations and the environment • Low trust in water companies communicating the safety of water to drink 	<ul style="list-style-type: none"> • Very knowledgeable about water supply deficit • Environmental groups prefer more longer-term focus and improved catchment management
Possible solutions	<ul style="list-style-type: none"> • Support desalination to a degree, as a temporary solution • Some people prefer water use restrictions • Water recycling preferred 	<ul style="list-style-type: none"> • Desalination is acceptable, but not ideal. • Direct water recycling favoured from environmental perspective, however, indirect favoured from water quality perspective environmental buffers provide
Engagement approach	<ul style="list-style-type: none"> • ‘Front-load’ engagement where possible 	<ul style="list-style-type: none"> • Demonstrate the actions are taken in response to engagement with stakeholders

Future engagement activities planned to Gate 2 are detailed further in Section 9 of Annex 15 Stakeholder and Customer Report respectively. The overall engagement approach is illustrated in Figure 6.

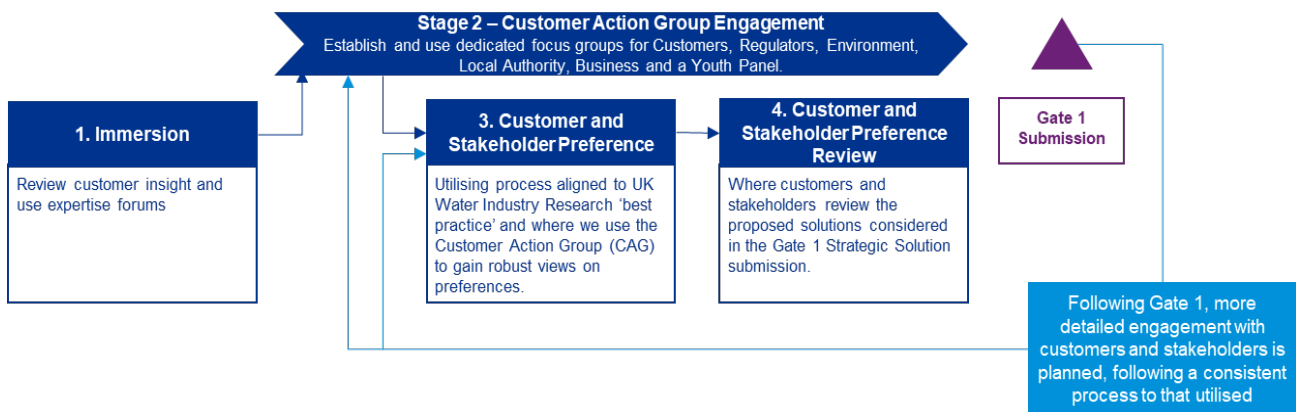


Figure 6 - Customer and Stakeholder Engagement Process

8.2 Engagement with regulators

SW has regularly engaged with key regulators during Gate 1, including RAPID, EA, NE and DWI, to ensure transparency regarding the work undertaken prior to Gate 1, the acknowledgement of opinion and regulation in the development of technical information submitted as part of SW's RAPID Gate 1 submission. This engagement will continue post Gate 1, as SW continues to investigate the Base Case and alternative options.

9 Key Risks and Mitigation Measures

A consistent approach to assumption, risk and opportunity identification and management process has been developed and applied across all solutions and configurations, detailed in Annex 14.0 Risk Report: Guidance Individual registers for assumptions, risks and opportunities have been developed for each option. The key assumptions, risks and opportunities are detailed in Annex 14.4 Risk Report: Additional Solution, with risks rated as 'high' detailed in Table 20.

Table 20 - Option D.2 Key Risks

Risk ID	Risk Description	Risk Category	Current Score	Mitigation Strategy	Residual Score
Recycle-R48	<p>[REDACTED] owing to the high level of permissions required to construct the pipeline route through highly designated environmental areas (River Itchen SAC/SSSI), across road (A3M) and rail infrastructure (Network Rail approvals), and numerous spatial constraints [REDACTED]</p> <p>[REDACTED] there is a risk that formal objection to the route is received during the planning process, which could result in programme delay .</p>	Stakeholders & Approvals	21	Continue to work through route selection assessment identifying key risks. Use “what if” scenario testing to understand impacts of amending the selected route. Perform detailed land referencing work to identify landowners and continue to develop detailed stakeholder communication plan to begin discussions (stakeholder list available in Annex 15 Stakeholder and Customer Report) as early as possible to discuss concerns. Develop mitigation plans with the relevant stakeholders to address their concerns including reviewing relevant elements of alternative routes. Work closely with the planning officer throughout the planning submission. As this work is still ongoing and information is still being collected, it is assumed that it will not yet assist in reducing the residual risk score, although it is a necessary step in the mitigation process. Once specific items are identified, the specific mitigation plans will inform the residual risk score.	19



10 Cost and Benefit

One of the RAPID requirements at Gate 1 is to provide 'A statement from Southern Water articulating the current hierarchy of solutions (i.e. in the absence of a regional plan which of the available solutions/combinations are considered to provide the best value for customers)'.

RAPID has requested that, as part of the gated process, SW considers a number of alternatives in addition to the Base Case. The assessment of alternatives in this way also represents prudent risk management and business planning, to ensure that should it be required, there is an alternative available to meet SW's supply obligation if it is not possible to implement the Base Case, despite using all best endeavours to do so. In addition, the consideration of alternatives is required in order to support important assessments such as SEA, HRA and Water Framework Directive Assessment (WFDA) as part of the gated process, and EIA, HRA and WFDA in the context of the subsequent planning and consenting process for the Base Case.

In order to identify and give appropriate consideration to alternatives in comparison to the Base Case, it was necessary for SW to progressively develop a suite of options with the potential to substitute options in the Preferred Strategy in WRMP19, should this be required. In order to identify alternatives, the following two phases of Options Hierarchy Development have been completed:

- Phase 1 – Emerging Option Development
- Phase 2 – Hierarchy Development

This document describes the methodology SW has used to prepare the hierarchy of Options to meet the Gate 1 requirements. It is important to note that at Gate 1 the purpose of the hierarchy is to consider 'best value for customers' at this concept development stage, as opposed to the original option development that took place for the WRMP19. In Phase 1 a number of steps were taken, as detailed below:

- a) PR19 Final Determinations set out the solutions for which Ofwat allocated funding to be progressed through the Gated Process and SW used this as the basis for developing a constrained list of appropriate additional solutions to the Base Case, as detailed in Annex 18 Option Hierarchy Development.
- b) This constrained list of options was subject to SW's ALP that enabled the development of the Long List of ten solutions, which are the subject of this submission

To develop the constrained list of options, a review was undertaken of desktop feasibility studies in respect of the unconstrained list as set out in Appendix 6 of WRMP19 and refined these as appropriate to reflect updated information since WRMP19. SW then applied the WRMP19 screening criteria in order to develop the constrained list of twenty-one solutions/options for consideration (including the base case), as detailed Annex 18 Option Hierarchy Development.

Through the SW Asset Life Cycle Process the constrained list was refined to a Long List of ten solutions capable of addressing the supply-demand deficit identified in WRMP. The initial steps, and interim design developments, of the ALP (outlined below) were used in the development of the constrained list detailed in Annex 18 Option Hierarchy Development, and those included on the Long List for Gate 1. The ALP initial and intermediate steps are:

- Understanding the need and basis for the project, together with the root causes of the need.
- Review of the WRMP 'Preferred Strategy' (desalination) and 'Strategic Alternative' (recycling) options.
- A detailed review of the proposed process technologies together with the source water constraints (e.g. water quality, maximum availability of the Water Treatment Works in the Southampton to Portsmouth area).
- From the above, the constrained list was developed taking into account, in particular, feedback from Natural England (NE) & the EA on the use of the River Itchen and from the DWI on requirements for water recycling. This resulted in alternative transfer being considered from a Water Recycling Plant to Otterbourne WTW.

- In parallel with steps 3 and 4, a water resource model was developed, based on the WRMP scenarios, to understand not only the peak of the drought, but also the shape (volume of water required) of the drought.
- The above information was presented to the Strategic Working Group to agree the final Long List.

Due to having ten Options, and thus a long list, under consideration at the point of submission to RAPID, SW consider that RAPID Gate 1 is approximately aligned to HM Treasury Green Book Strategic Outline Case7 (SOC) 1 stage. Based on this, in accordance with the HM Treasury Green Book guidance¹, a Multi-Criteria Decision Analysis (MCDA) has been used to develop the hierarchy for this Gate 1 submission and was applied as part of Phase 2.

MCDA is a structured technique of looking at complex problems that are typically characterised by monetary and non-monetary objectives in order to break the problem down into manageable pieces. The technique is used to support decision making in the context of assessing multiple options against a range of objectives and considering their relative importance. It is typically used in the early stages of scheme appraisal; providing a practical and robust means of assessing options against both quantitative and qualitative criteria and is complimentary to other techniques which primarily use monetary valuations, such as Cost Benefit Analysis (CBA). Due to the Base Case and alternatives being at the concept design stage, consistent with Gate 1, and there remaining to be some uncertainties over matters such as the technology to be employed and the precise site locations, a full Cost Benefit Analysis (CBA), as detailed within the HM Treasury Green Book, is not appropriate at this stage and will be undertaken prior to Gate 2 after further design and assessment work has been undertaken. The MCDA consisted of 33 individual criteria allocated across five themes that are considered to contribute to determining 'best value for customers', as detailed below:

1. Extent of Alignment to National, Regional and Corporate Objectives;
2. Perceived Level of Delivery Risk;
3. Perceived Level of Operational Risk;
4. Impacts on the Environment and Potential Benefits; and
5. Impacts on our Stakeholders and Potential Benefits.

The criteria were developed through consideration of the strategic challenge, customer and stakeholder high priority success factors, the SW definition of 'best value for customers', WRMP screening criteria and the HMT Greenbook Critical Success Factors, as detailed in section 2.2.2.2.2 of Annex 18 Option Hierarchy Development.

Following the development of the MCDA criteria, SW reviewed each criterion to determine a weighting factor so as to place the required importance/emphasis on those that most influence/impact 'best value for customers'. The weighting allocation is detailed in Appendix B of Annex 18 Option Hierarchy Development. The MCDA process was undertaken by key SW and WCSN programme personnel from the following disciplines:

- Programme Strategy;
- Infrastructure Engineering;
- Process Engineering;
- Environmental and Planning;
- Procurement;
- Customer and Stakeholder Management;
- Project Management;
- Risk Management; and
- WCSN project lead (with support from appropriate SW personnel to give comparator perspectives for options that the WCSN project lead would not have knowledge of)

The MCDA results are informed by feasibility evidence currently available to SW and detailed throughout the technical annexes that constitute the Gate 1 submission.

The MCDA can necessarily only be informed by and based on the feasibility evidence that is currently available to SW at this concept design stage. As noted above, there remains uncertainty over a number of key elements of the various solutions, including technology, specific location and other matters. There is also

considerable further design and assessment work to be undertaken on all of the options. This means that a range of assumptions have had to be made for the purposes of this Gate 1 submission and in the context of the MCDA, a number of which are conservative and are expected to be refined prior to Gate 2. This must be borne in mind in the context of the hierarchy resulting from the MCDA process, which is essentially based on a 'snapshot' of the ongoing assessment of the solutions.

It must also be borne in mind that the hierarchy that SW has been asked to produce is intended to reflect best value for customers, to the extent possible at this concept design stage, for the purposes solely of satisfying the requirement for such a hierarchy at Gate 1 by RAPID. This means that the criteria used to score the various solutions, and the weighting applied to them, have been developed based on the issue of 'best value for customers' and considerations relevant from this perspective, as described above. The MCDA and resulting hierarchy therefore necessarily cannot and do not reflect the wider range of considerations that SW is required to consider when progressing the development of the solutions, including SW legal obligations under the s.20 Agreement, assessment of alternatives from the perspective of SEA, HRA or WFD or wider issues relating to deliverability and risk.

For example, the MCDA, being focused around the issue of 'best value for customers', therefore places only limited weight on matters such as SW' obligations under the s.20 agreement, which is one reason why desalination ranks lower in the hierarchy than would be expected if the MCDA was not strictly based around 'best value for customers'.

The hierarchy, as a result of the MCDA is detailed in Table 21. CBA assessments will be undertaken post Gate 1.

Table 21 - Current indicative MCDA driven option hierarchy

Options no.	Option Name	Overall Scores	MCDA Hierarchy	NPV	ABE Target Date	Upper Limit Target Date
1	[REDACTED]	100	1	100	2025	2025
2	[REDACTED]	80	2	80	2025	2025
3	[REDACTED]	70	3	70	2025	2025
4	[REDACTED]	60	4	60	2025	2025
5	[REDACTED]	50	5	50	2025	2025
6	[REDACTED]	40	6	40	2025	2025
7	[REDACTED]	30	7	30	2025	2025
8	[REDACTED]	20	8	20	2025	2025
9	[REDACTED]	10	9	10	2025	2025
10	[REDACTED]	0	10	0	2025	2025

[REDACTED]

[REDACTED]

The solution costs detailed in Table 21 have been developed in-line with relevant HM Treasury Green Book guidance. The process followed is detailed in Annex 12 Cost Report.

Whilst CBA is not appropriate at this stage, SW has conducted a qualitative high-level benefit and impact [REDACTED]



assessment for all Long-List Options considered in the Gate 1 submission by SW, which is independent of, and does not contribute to, the MCDA process. As a result of the current uncertainties which are to be expected at SOC stage, costs and benefits for each option have been assessed qualitatively on a 'high', 'medium and 'low' basis, as detailed below:

- = Net benefit expected i.e. the benefits are expected to exceed the costs²
- = Negligible net benefit expected i.e. the magnitude of costs and benefits are expected to be similar to one other and 'offset' each other in calculating the cost benefit ratio
- = Costs are expected to exceed benefits i.e. net disbenefit is expected to be realised.

The assessment outcomes are detailed in Table 22.

Table 22 - Qualitative benefit and impact assessment

Benefit		D.2
1	Resilience: Provides greater resilience of water supply to the Hampshire region during drought scenarios	Commentary: Option D.2 has the potential to increase regional resilience and act as an enabler to the further potential water recycling in WMP24. Option D.2 does not in itself create a new source of raw water in the same way as WR and desalination, but instead utilises existing sources in a more effective manner.
	Water resources: Aligns with National Policy requirements, where SW considers the efficient use of water resources at a regional level	Commentary: All proposed options meet National Framework and guidance requirements. This is detailed further in Section 11.2.
3	Environmental: Enhanced provision for biodiversity, flora and fauna	Commentary: Option D.2 has a lower environmental impact than either desalination or water recycling. By comparison with conventional water transfers (e.g. Option D.2), desalination and water recycling are both highly energy intensive process, causing high carbon emissions during operations. If planned and implemented correctly, Option D.2 can have a net neutral environmental impact.
	Amenity value: Increased amenity provision for the local community(ies)	Commentary: [REDACTED]
5	Customer and Stakeholder: Preferential customer and stakeholder solution	Commentary: Option D.2 is favoured by stakeholders as there is a reduced need to invest in and construct significant infrastructure, such as treatment plants. However, some customers remain unconvinced at the prospect of water transfers, suggesting that they are simply 'moving the problem' from one region to another. Further detail is provided in Annex 15 Stakeholder and Customer Report.
	Water Quality: Enhanced water quality – for customers and across water bodies e.g. rivers, streams and ocean	Commentary: [REDACTED]
7	Carbon Emissions: Offsets carbon emissions and has potential for carbon net zero without need of external initiatives (e.g. tree planting)	Commentary: Option D.2 provides opportunity for carbon net gain through the regeneration of flora and fauna [REDACTED] with minor carbon emissions offsetting and environmental benefits. By comparison, water recycling and desalination are both high energy intensity solutions with large carbon footprints. Further details are provided in Annex 10.4 Environmental: Additional Solution.
	Deliverable and Operable: Southern Water have experience delivering and operating the required technology and systems	Commentary: Option D.2 utilises conventional technology (pumped transfers) with which SW has many years of experience. Other than during commissioning and asset handover, it is not anticipated that any specific training will be required for SW operatives. Furthermore, spare parts and specialist delivery capability are readily available regionally and within the UK market.
9	Futureproof:	[REDACTED]

Option	Aligns to National Framework	Commentary
		<p>increase overall supply and facilitate the movement of water to where it is needed, in accordance with the National Framework. The increased storage available for transfer would broaden the types of supply available in normal or drought conditions, increasing resilience overall in accordance with the National Framework. The National Framework supports the investigation and consideration of options that combine transfers and supply increases, to define optimum solutions.</p> <ul style="list-style-type: none"> Southern Water's assessment is that Option D.2 is in accordance with National Framework requirements as identified to date.

12 Assurance

12.1 Assurance Process

SW have adopted the 'three lines of defence' assurance framework for reporting governance and assurance activities. This framework illustrated in Figure 7.

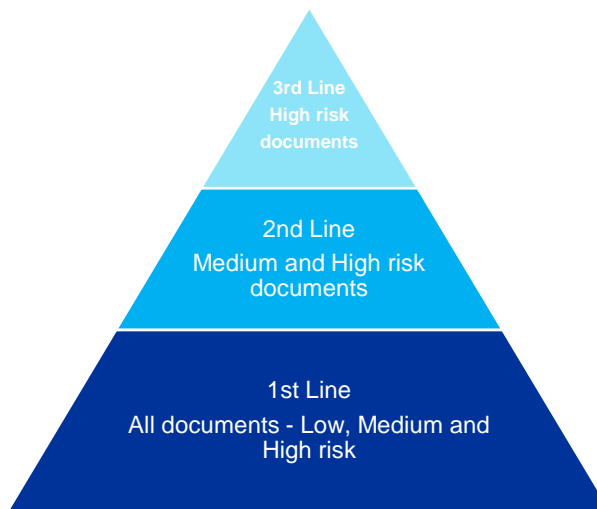


Figure 7 - 'Three lines of defence' framework

Key components of the assurance activities within each 'line of defence' are included in Table 25, with further detail provided in Annex 1 Assurance Process.

Table 25 - WfLH programme components of the 'three lines of defence' model

Line of defence	Key components involved in assurance process (Further details provided in Annex 1 Assurance Process)
First line	<ul style="list-style-type: none"> Each area had a nominated lead responsible for reviewing, checking and validating content The Executive Programme Board reviewed and challenged key content prior to sharing with the Board. Workstreams consulted a range of external experts and resources Data checking and accuracy of key facts and data was confirmed by data providers and verified by reviewers to identify potential inconsistencies.
Second line	<ul style="list-style-type: none"> Workstream independent compliance and completeness review and check, completed by the central programme management team
Third line	<ul style="list-style-type: none"> The first round of assurance – All high-risk areas assessed in line with the scope, highlighting areas of improvement and focussing on defined areas of risk. The second round of assurance – Review that initial recommendations had been addressed and measuring the overall maturity and quality of the documents against Regulators' requirements. Strategic assurance, completed by PwC, and technical Assurance, completed by Jacobs

SW's third-party assurance providers have completed assurance reports, detailing the assurance process and the findings of the assurance process, which is provided in Annex 1 Assurance Process.

The WfLH programme working group have been regularly engaged with during the development of the Gate 1 submission. This engagement has provided regular review as part of the first line of defence assurance activities. The schedule of Board engagement is detailed in Section 3 Annex 1 Assurance Process.

12.2 Board Assurance Statements

The Board has challenged and satisfied itself that the overall strategy for the approach to the Gate 1 submission and data assurance is appropriate. This submission progresses solutions to meet a 1-in-200-year drought scenario in SW's Western Area. We recognise from the Draft Water Resource Planning Guideline that solutions to meet 1-in-500-year resilience will be required in the future, and we are therefore considering options which could be scaled up to meet this future requirement. We look forward to working with Water Resources South East (WRSE) to assess regional solutions that provide best value customer and environmental outcomes as part of the next water resources management plan.

We confirm that:

- all the elements add up to an accelerated Gate 1 submission that is high quality and meets the requirements as set out in the PR19 Final Determination and subsequent guidance from RAPID.
- we have put in place a risk-based assurance process to help improve the accuracy and robustness of the data and estimates used to develop the Gate 1 submission.
- we endorse the solutions in scope at this stage, for continuation to the next stage of the RAPID process, and the addition of [REDACTED] an additional solution to the accelerated gate process.
- we are committed to transparent reporting of high-quality data that can be trusted.

The Board is aware of the West Country Sources North solution, developed jointly with Wessex Water and Bristol Water. We understand our role as water resource recipient in this submission and are satisfied that an appropriate strategy has been implemented to assure the approach and data. We will continue to monitor the progress of this solution and associated risks during the accelerated gate process.

How the Board has Satisfied Itself

- We adopted an assurance framework for the Gate 1 submission which follows the 'three lines of defence' model.
- The Board reviewed the proposed scope and approach of third-party assurance.
- PwC provided strategic assurance, confirming the quality of the submission and consistency with documents referred to.
- Jacobs provided technical assurance, focussing on reliability, consistency and quality of data, and efficient cost expenditure.
- We established a Board working group which reviewed key parts of the submission.
- The Board working group met directly with PwC and Jacobs in September 2020 to discuss their findings, PwC also attended the Audit Committee in September 2020. Final assurance reports were provided to the full Board for consideration in approving the submission.

Further evidence

- Engagement with the submission team through the Board working group (Table 6, Annex 1 Assurance Process).
- The executive programme board challenged key areas of the plan, informing the Board working group (Table 6, Annex 1 Assurance Process).
- Detailed assurance framework.
- Assurance reports (Jacobs and PwC reports, Appendix 1)

- [REDACTED]
- Concept Design Report preparation; and
- Constructability review, to determine the feasibility, assess the complexity and inform construction sequencing.

15.2 Environmental

- Environmental Assessments, Including HRA and WFD;
- More detailed natural capital, carbon and benefit assessments;
- Water quality sampling; and
- Other surveys to inform Gate 2 design progression.

15.3 Planning

- Preparation of an updated technical note supported by further legal and planning advice on selection and confirmation of preferred consenting route;
- Preparation of a Planning Strategy setting out deliverables and strategy for the confirmed consenting route; and
- Commence DCO Stage 1 pre-application work.

15.4 Stakeholder Consultation

- Commencing consultation with specific stakeholders, e.g. Highways England, Network Rail, local planning authority;
- Continuing engagement with relevant stakeholders, e.g. RAPID etc.
- Landowner identification and stakeholder engagement;
- [REDACTED] and
- Customer preference studies: more detailed quantitative data to support qualitative data collected for Gate 1 submission.

15.5 Legal and Commercial Considerations

- [REDACTED]

15.6 Procurement

- Develop procurement strategy including assessment for potential DPC;
- Identification and allocation of commercial risk; and
- Development of the contractual structure and detailed procurement strategy.

15.7 Cost Management

- Updated cost assessments for proposal, reflecting advancement of solution; and
- Updated risk assessments, reflecting advancement of solution.

15.8 Schedule Management

- Develop solution schedule for activities that need to be undertaken prior to each subsequent gate; and
- Proposals for gate three activity and outcomes and penalty scale assessment criteria and contributions.

At Gate 2 a more detailed plan will be presented for those solutions that are proposed to continue beyond Gate 2. This will detail the specific activities and deliverables associated with Gate 3 and 4.

It is the intention of SW, where reasonably practicable and utilising an ABE approach, to maintain the Regulatory Milestone Dates as detailed in Section 2.2 of Annex 20 Gate 2 Activity Plan.

The penalty / reward scales and assessment mapped to the RAPID Gate 2 assessment criteria and associated penalty scales is detailed in Annex 20 Gate 2 Delivery Plan.

Appendix A: Submission of New Solution – Response to Questions Raised by RAPID

Southern Water has identified an Additional Solution proposal that will be presented as part of its accelerated gate 1 submission. This paper has been prepared in response to RAPID's request for a note that answers the following questions about the new Additional Solution:

1. *Is there value in accelerating the solution's development to be 'construction ready' by the 2030s?*
2. *Does the solution need additional enhancement funding for investigations and development?*
3. *Does the solution need the additional regulatory support and oversight provided by the Ofwat gated process and RAPID?*
4. *Does the solution provide a similar or better cost / water resource benefit ratio compared to current solutions?*

The New Solution:

As part of its WRMP19 response, Southern Water (SW) is collaborating with Portsmouth Water (PW) to develop a new 8,700MI impounding reservoir (Havant Thicket Winter Storage Reservoir - HTWSR). This will provide a minimum contribution of 21MI/d of treated bulk water transfer between SW and PW's networks.

The new solution (the Additional Solution) (identified in the gate 1 submission as Option D.2), is an additional option that SW is considering as an alternative as required by the Gated Process. [REDACTED]

For specific details of this Additional Solution, please see Strategic Solution Gate 1 Submission: Preliminary Feasibility Assessment Additional Solution Proposal. For an overview of Southern Water's gate 1 submission, including details of the Additional Solution (Option D.2), please see Strategic Solution Gate 1 Submission: Submission Summary.

Southern Water's Response to RAPID's Questions

Q.1 Is there value in accelerating the solution's development to be 'construction ready' by the 2030s?

SW believes that there is value in accelerating the Option's development to explore whether it could be 'construction ready' by the 2030s for the following reasons:

1. RAPID has requested that as part of the gated process, SW also considers alternatives in addition to the Base Case. Although it is in the early stages of development, the Additional Solution (Option D2) (the new solution) potentially offers a viable alternative to the Base Case and, SW believes, merits further investigation as a potential Option;
2. [REDACTED]
3. The additive cost of Option D2 (in CAPEX and TOTEX terms) is substantially lower than the other Options under consideration;
4. The Additional Solution could potentially have a lower environmental impact than either desalination or water recycling;
5. The Additional Solution has the potential to increase regional resilience and act as an enabler to the future implementation of water recycling in WRMP24;
6. In this scenario (with new Option D2 augmented with water recycling), the combined solution could potentially be resilient to a 1 in 500 year drought, representing a potentially truly strategic asset offering significant regional resilience for multiple organisations; and

7. Schedule forecasting undertaken confirms that the Additional Solution can potentially be commissioned and in service by the final quarter of 2028, [REDACTED]

Q.2 Does the solution need additional enhancement funding for investigations and development?

To support the development of the Additional Solution and an exploration of its potential to deliver the benefits outlined above, dedicated enhancement funding for investigations and development will be required. Whilst the Option has been sufficiently well developed to present in the RAPID requested PFA format, it isn't as well developed as other Options presented as part of the accelerated gate 1 submission. It will therefore need to follow an accelerated development process than adjacent solutions, between gates 1 and 2. SW forecasts that this work will cost [REDACTED]

[REDACTED] (this is inclusive of costs for developmental activities at stage gates to Gate 4).

SW proposes that, rather than attracting additional enhancement funding, costs are reallocated from within the programme funding permitted under the FD. This is made possible due to cost savings derived in the development of desalination and water recycling solutions. This arrangement will support the accelerated development of the Additional Solution between gates 1 and 2, reaching gate 2 at the same level of maturity as the other solutions.

Further details of funding allocation forecasts for future gates are included in Strategic Solution Gate 1 Submission: Preliminary Feasibility Assessment Additional Solution Proposal and Strategic Solution Gate 1 Submission: Annex 19 Efficiency of Expenditure. Details of specific activities proposed to Gate 2 and other future gate activities are included in Annex 20, Gate 2 Activity Plan.

Q.3 Does the solution need the additional regulatory support and oversight provided by the Ofwat gated process and RAPID?

SW considers that the new solution would benefit from inclusion in the Ofwat gated process, thereby attracting the additional regulatory support and oversight provided by RAPID, for the following reasons:

1. It is a Solution that has been identified during activities undertaken to Gate 1 as a potential alternative to the Base Case, and a contingency against the risk of not delivering the [REDACTED] desalination plant (Option A1);
2. It shows strong potential to be progressed as a strategic alternative option so that we can understand more about its potential regional resilience benefits [REDACTED]
3. [REDACTED] and
4. If taken forward at gate 2, the solution will require AMP8 funding to enable development.

Q.4 Does the solution provide a similar or better cost / water resource benefit ratio compared to current solutions?

To the extent that the current level of solution maturity can inform this assessment, the Additional Solution potentially offers very significant advantages in terms of the ratio of cost / water benefit as compared the other solutions under consideration.

The Additional Solution [REDACTED] in the Multi Criteria Decision Analysis (MCDA) assessment undertaken as part of activities to Gate 1, achieving first place in the following categories:

1. Perceived level of delivery risk;
2. Perceived level of operational risk;
3. Impacts on the environment and potential benefits; and
4. Impacts on SW's stakeholder and potential benefits

The Additional Solution also has a forecast Net Present Value which is significantly lower than any alternative Option [REDACTED] less than the next most cost-effective viable alternative. For further details please see Strategic Solution Gate 1 Submission: Annex 18 Option Hierarchy Development and Strategic Solution Gate 1 Submission: Preliminary Feasibility Assessment Additional Solution Proposal.